

Implementing a Hospital-Based Safe to Sleep Program

A POLICY & EDUCATION DEVELOPMENT GUIDE



THIS
SIDE
UP

GEORGIA
SAFE TO SLEEP
CAMPAIGN

Implementing a Hospital-Based Safe to Sleep Program

A Policy & Education Development Guide

Table of Contents

Introduction	3
Statement of Purpose	3
A Brief History of Recommendations	4
AAP Recommendations	7
Step by Step Guide	
1. Designate an internal Safe to Sleep Champion.....	9
2. Complete the short baseline survey	9
3. Send Information to the DPH Safe to Sleep Coordinator.....	9
4. Project deliverables	9
5. Model Safe Infant Sleep	10
6. Educate	13
7. Audit	14
8. Conduct Community/Media Outreach	14
Attachments	15
A. Crib Audit Tool	
B. Pledge of Intent	
C. Sample Policy Outline	
1. Hospital Policy Template	
2. Model Behavior - NICU	
3. Model Behavior - Well Baby Unit	
4. UC Medical Center - Safe Sleep for Infants Example Policy	
D. Sample Training Materials	
1. SIDS and Sleep-Related Causes of Infant Death: Q&A for Health Care Providers	
2. Continuing Education Program – Curriculum For Nurses	
E. Sample Posters	
F. Sample Educational Materials	
1. Educational Flip Chart for Educator Use	
2. Sample Caregiver Handouts	
G. Sample Acknowledgement Forms	
H. Sample Safe to Sleep Program Audit Form	
References	
1. Back to Sleep in Neonatal ICU Practice	
2. Cribs for Kids - Safe to Sleep Certification Guidelines	
3. AAP – Policy Statement: SIDS and Other-Sleep Related Infant Death	
4. AAP – Technical Report: SIDS and Other- Sleep Related Infant Death	



Statement of Purpose

To provide written guidance for hospitals and other health care facilities about implementing and modeling infant safe sleep protocols within their facility. These infant sleep practices should be followed for all healthy infants up to one year of age.



Introduction: Why develop and implement a hospital safe to sleep policy?

- Sleep related deaths are a major, largely preventable, burden of death to infants in Georgia and the United States.
- As of 2013, Georgia averaged 3 infant deaths a week due to sleep-related causes.
- It has been demonstrated that observing hospital staff utilizing safe sleep practices reinforces the behavior for parents when they return to their home.
- Hospitals have the ability to reach just about every new parent within the community.
- Nationally, and in the State of Georgia, African American infants die from unsafe sleep practices at a rate two to three times higher than Caucasian and Hispanic infants.
- Hospitals have the ability to become a regional leader in protecting infants and reducing preventable infant sleep-related deaths.
- Reducing infant deaths and increasing supine sleeping are objectives of Healthy People 2020.
- The American Academy of Pediatrics issued updated recommendations in October, 2011 on safer infant sleep practices.
- Role modeling and provider education have been demonstrated to lead to significant increases in adherence to safe infant sleep guidelines.

Goals:

To provide accurate and consistent safe infant sleep information to hospital personnel including medical, nursing, breastfeeding, child birth education, and nutrition staff.

To enable hospitals to implement and model safe infant sleep practices throughout their facility.

To provide guidance to healthcare staff on addressing safe infant sleep concerns and issues.

Long Range Goals:

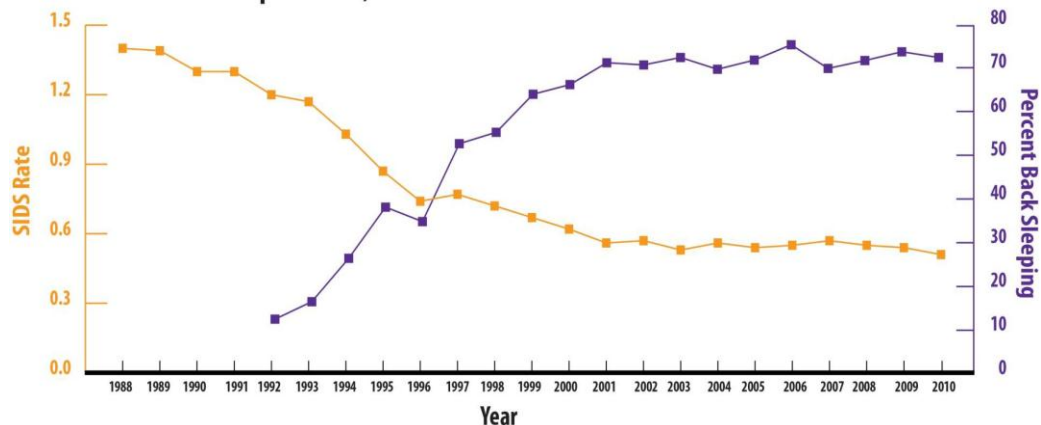
Enable providers to have an accurate and informative conversation with parents about decisions regarding safe sleep for their children.

To reduce infant mortality attributed to sleep-related infant deaths.

A Brief History of the Safe to Sleep Recommendations

- In 1992, the American Academy of Pediatrics (AAP) issued its first recommendation on infant sleep which was to place infants supine (on their back) or on their side. Until this time, there were no consistent recommendations provided that were rooted in science and based upon research.
- In 1994, the National Institute on Child Health and Development (NICHD) launched the “Back to Sleep” Campaign. This campaign was very successful and resulted in a large number of children being placed either on their back or side for sleep. The result was a dramatic drop in SIDS (Sudden Infant Death Syndrome) deaths.

U.S. SIDS Rate and Sleep Position, 1988–2010



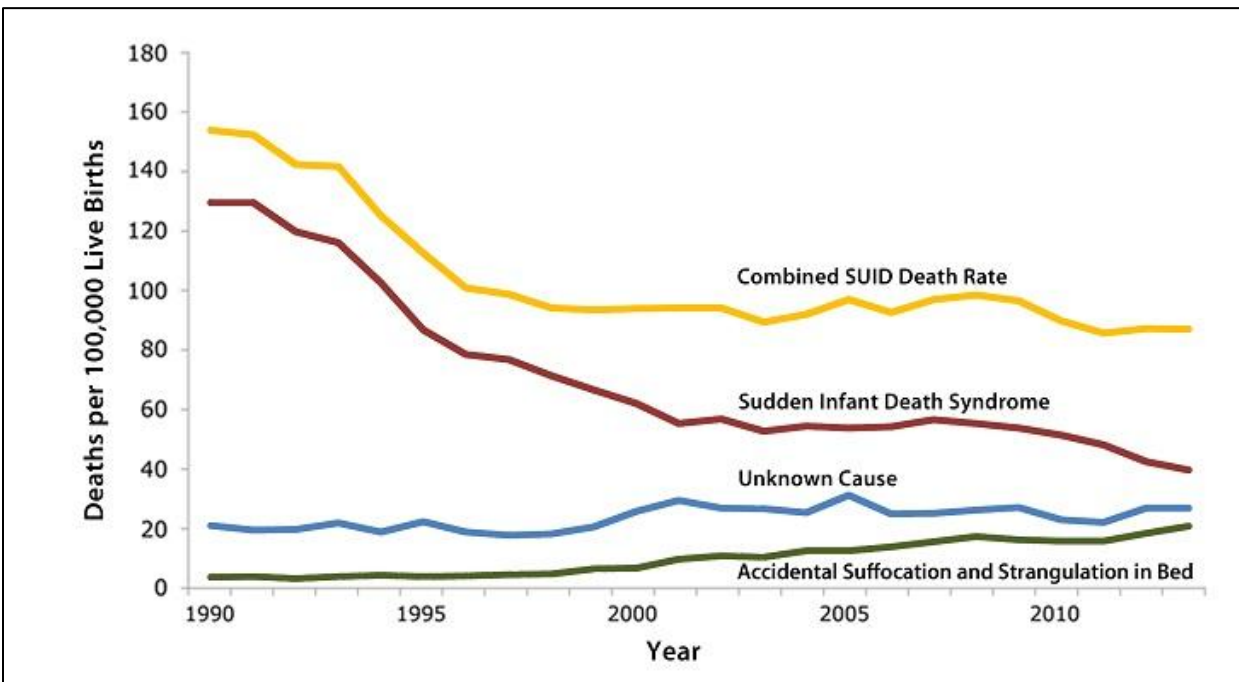
- In 2005, the AAP **changed the recommendation from supine or side, to supine only.** It eliminated any recommendation of side sleeping for healthy infants.
- In 2011, the AAP further expanded their recommendations on infant safe sleep to include the sleep environment. At the same time that SIDS rates were declining, it was discovered that deaths specifically from suffocation and strangulation in bed were increasing. It was at this same time that the term SUID was introduced. SUID or Sudden Unexpected Infant Death is defined as the death of an infant less than 1 year of age that occur suddenly and unexpectedly, and whose cause of death is not immediately obvious prior to an investigation. After a case investigation, some SUID deaths can be attributed to various etiologies such as suffocation or entrapment. If no etiology is determined, and 3 criteria are met: autopsy, death scene investigation and review of clinical history then the SUID is classified as a SIDS death. Thus, SUID cases are divided up into those cases in which a cause of death is identified following a death scene investigation and/or an autopsy and those in which no etiology is found. If no etiology is found, then the SUID case is labeled as SIDS
- Many past SIDS cases (prior to the onset of death scene investigations) are now believed to have been SUID. SUID cases often involve unsafe sleeping environments and one or more risk factors for SIDS; therefore, infant safe sleep must incorporate not only the sleep position but, also the sleep location and environment.
- The new AAP recommendations were split into 3 levels based on scientific rigor:

Level A: Recommendations are based on good and consistent scientific evidence (i.e., there are consistent findings from at least 2 well-designed, well-conducted case-control studies, a systematic review, or a meta-analysis). There is high certainty that the net benefit is substantial, and the conclusion is unlikely to be strongly affected by the results of future studies.

Level B: Recommendations are based on limited or inconsistent scientific evidence. The available evidence is sufficient to determine the effects of the recommendations on health outcomes, but confidence in the estimate is constrained by such factors as the number, size, or quality of individual studies or inconsistent findings across individual studies. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Level C: Recommendations are based primarily on consensus and expert opinion.
(AAP, 2011)

Trends in Sudden Unexpected Infant Death (SUID) rates in the United States from 1990-2013.



SOURCE: CDC/NCHS, National Vital Statistics System, Compressed Mortality File.

- Sudden infant death syndrome (SIDS) rates declined considerably from 130.3 deaths per 100,000 live births in 1990 to 39.7 deaths per 100,000 live births in 2013. Most of this drop occurred between 1992 and 2001. Since 2001, there has been little change.
- Unknown cause infant mortality rates remained unchanged from 1990 through 2013. In 2013, the unknown cause mortality rate in infants was 26.8 deaths per 100,000 live births.
- Accidental suffocation and strangulation in bed (ASSB) mortality rates remained unchanged until the late 1990s. Rates started to increase beginning in 1998 and reached the highest rate at 20.8 deaths per 100,000 live births in 2013.
- Codes for cause of death were defined according to the International Classification of Diseases, Ninth Revision (ICD-9) for 1984-1998, and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) for 1999-2004. We defined cause of death by using the following ICD-9 and ICD-10 codes: ASSB (E913.0; W75), SIDS (798.0; R95), and unknown cause, (799.9; R99) based on the underlying cause of death. The combined SUID death rate was the combination of ASSB, SIDS, and unknown cause deaths.

The AAP Recommendations:

The American Academy of Pediatrics (AAP) Task Force on Sudden Infant Death expanded its recommendations on the promotion of safe infant sleep environments in October of 2011. These recommendations are listed below by scientific category. At first glance, this list may seem daunting, especially when considered within the busy environment of a hospital and maternity ward however, it should be noted that the top four safe to sleep recommendations,

- Baby is placed on his or her back to sleep, for every sleep
- Use a firm sleep surface
- Room-sharing without bed-sharing
- Keep soft objects and loose bedding out of the crib,

are the most crucial and the ones that can best be addressed within the hospital. Education and advice on breastfeeding and the avoidance of overheating should already be provided and will compliment your safe infant sleep activities.

Currently for parents, there remains some confusion surrounding the recommendations. Infant Safe to Sleep policies are one of the best methods to ensure that families are given the opportunity to fully and completely understand how to best protect their infants from preventable sleep-related deaths. These recommendations have been established to help reduce the risk of infant death and are proven effective in this effort.

Level A recommendations:

- Back to sleep for every sleep
- Use a firm sleep surface
- Room-sharing without bed-sharing
- Keep soft objects and loose bedding out of the crib
- Pregnant women should receive regular prenatal care
- Avoid smoke exposure during pregnancy and after birth
- Avoid alcohol and illicit drug use during pregnancy and after birth
- Breastfeeding
- Consider offering a pacifier at nap time and bedtime (after breastfeeding is established)
- Avoid overheating
- Do not use home cardiorespiratory monitors as a strategy for reducing the risk of SIDS. However, cardiorespiratory monitors may be prescribed if an infant is having episodes of not breathing or low heart rates.
- Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep related infant deaths, including SIDS, suffocation, and other accidental deaths; pediatricians, family physicians, and other primary care providers should actively participate in this campaign

Level B recommendations:

- Infants should be immunized in accordance with recommendations of the AAP and Centers for Disease Control and Prevention
- Avoid commercial devices marketed to reduce the risk of SIDS
- Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly

Level C recommendations:

- Health care professionals, staff in newborn nurseries and NICUs, and child care providers should endorse the SIDS risk-reduction recommendations from birth
- Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising
- Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely

To access the full article, visit:

www.pediatrics.org/cgi/doi/10.1542/peds.2011-2284



Step 1: Designate an Internal Safe to Sleep Champion

The Safe to Sleep Champion is someone willing and able to oversee and help guide the hospital-based Infant Safe to Sleep Program. It is important to have an advocate as the designated point of contact for staff and leadership. Additionally, the Safe to Sleep Champion will help to coordinate activities and will become the main point of contact for the Georgia Department of Public Health (DPH), Safe to Sleep Campaign Coordinator. Some facilities may choose to launch a large, multi-level awareness program while others may be satisfied with instituting policy change and educating their staff. The choice rests completely within the facility and the needs that are present in each particular locality.

Step 2: Complete the Short Baseline Survey

In order to fully assess what, if anything needs to be addressed by education and policy change, a short pre-intervention survey should be conducted.

This survey will also give a baseline for future evaluation of the effectiveness of the implemented infant Safe to Sleep program activities.

Suggested items to survey:

1. Whether or not there is an infant safe sleep policy or guidelines already in place at your facility or departments within it.
2. Whether or not there are requirements for staff training on the infant safe to sleep recommendations.
3. Whether or not there are any requirements for patient education.

4. Whether or not room sharing instead of bed sharing is discussed or promoted.
5. Whether or not there are any infant safe to sleep materials provided to the parents during their stay.
6. A number of completed “crib audits”.

Crib audits (Attachment A) are designed to gauge the reality of the infant sleep situation within the facility, despite the presence or absence of a policy or guidelines. Completing these steps will give you invaluable numbers and information for which you can evaluate and measure the effectiveness of any interventions.

Step 3: Send Information to the DPH Safe to Sleep Campaign Coordinator

Along with the Hospital Safe to Sleep Partnership Pledge of Intent (Attachment B), send the survey information to the DPH Safe to Sleep Campaign Coordinator. This will signify your facility’s participation in the Infant Safe to Sleep Program and make it eligible for recognition as a community leader in infant safety, as well as, any education materials that are available after your program is enacted.

Step 4: Program Development

Developing a hospital-based Infant Safe to Sleep Program requires two main components: program acceptance and curriculum development.

Program acceptance must occur at multiple levels of the organization including; hospital administration, physicians, and nursing staff. Past efforts have found initial program support most readily at the physician level. It is advised to initially focus on the staff that are already knowledgeable about SIDS and accidental infant sleep-related deaths. Pediatricians, neonatologists and emergency room physicians

all have first-hand experience with these tragedies, so they often have a more tangible interest in eliminating these events in their communities. Additional support can be obtained by working with public health advocacy groups such as local Boards of Health, Safe Kids Coalitions, Cribs for Kids programs, and Child Death Review teams (PPOR, 2003).

Next, consider reporting baseline survey results to your Perinatal Leadership, Hospital Administration, Well Baby Nursery Medical Director, Lactation Support, and any other identified participants to inform them of the status of your facility's infant safe to sleep practices. The presentation should: 1) explain the scope of sleep-related infant deaths, including both national and local statistics, 2) the results of the baseline survey, 3) describe the logistics of the program and, 4) discuss cost-effectiveness (if applicable).

In a hospital-wide program, initial discussions should include head nurses of the newborn nursery, intensive care nursery, labor hall, and the pediatric floor (can also consider the emergency department). Discussions should be held at the staff organizational level, including multidisciplinary committees (i.e., newborn or neonatal care committees, nursing counsels such as education and practice committees). These committees contain nurses who are leaders and can support the dissemination of the program concept to the general staff. (PPOR, 2003)

Curriculum development relates to deciding what the new policy will represent and how it will be explained and taught to new and current staff. The next section discusses policy development and staff training in further detail. Developing curriculum can seem a daunting task; however, the DPH Safe to Sleep Campaign Coordinator is available to assist in the creation of training materials.

This is also a time to set goals and establish where you would like to see your facility within the next year to two years when it pertains to the safety of infants while sleeping. Setting firm goals and objectives will assist in implementation, as well as evaluation, of your program.

Step 5: Model Safe Infant Sleep

Now it is time to fully adopt and implement internal Infant Safe to Sleep policies. There are numerous examples of Safe to Sleep hospital policies that can be used to assist in the development of your facility's policy. A number have been provided for your reference (Attachment C). A good place to start is to ensure that the following areas (adopted from the 2011 American Academy of Pediatrics Recommendations) are covered in the policy.

Policy & Procedure:

Sleep Position:

Sleep Surface:

Bedding:

Smoking, Drugs, Alcohol:

Sleep Environment:

Pacifier Use:

Overheating/Over-bundling:

NICU Specific Policy:

Positioning Aids:

Monitoring Devices:

Tummy Time:

Breastfeeding:

Immunizations:

Discharge Instructions:

Once the policy guidelines have been established and agreed upon, it is time **to train staff and physicians** on the new measures. It is vital that staff develop a level of expertise on infant safe to sleep recommendations in order to become comfortable discussing safe infant sleep issues with families. Studies show that some nurses are often reluctant to be safe sleep advocates for multiple reasons including: a lack of formal training, a lack of time to review research, a lack of understanding of statistics, and disbelief that changing their behavior will make a difference (Stasny 2004).

Nurses are crucial role models for parents. Parents who merely see their baby placed supine in the nursery are almost **twice as likely** to continue this practice at home. When the correct behavior is modeled and followed up with a conversation on safe to sleep recommendations, adoption of safe behaviors is increased even more significantly.

There are some potential issues in the nursing component of the safe infant sleep education. Recognizing these concerns at the outset will result in better program compliance. One important area of concern involves breastfeeding. Some individuals will claim that an infant safe to sleep program is anti-breastfeeding because the baby is not recommended to sleep in the mother's bed.

This statement is false. Safe infant sleep programs fully support the AAP recommendation that all infants be breastfed and that breastfeeding is considered a protective factor against SIDS. In an effort to eliminate concerns of overlay and entrapment while reducing concerns of suffocation, the AAP supports room sharing instead of bed sharing, especially during the first 4 most vulnerable months of an infant's life. This allows for the infant to remain close to his or her parents and helps to facilitate breastfeeding, but also protects the infant from a potentially deadly sleep environment.

The recommendation to room share instead of bed share is one recommendation, amongst many, that help parents know how to create a safe sleep environment for their child. If a parent feels strongly about bed sharing, they still have the right to learn what to do to reduce the risks and increase protection of their infant from sleep-related death. Breastfeeding advocates who are also bed sharing advocates support the creation of a sleep environment that is "safer" than just bringing the baby into bed with the parent. The recommendations for safe infant sleep hold true across both belief systems. This is why we are encouraging nurses and other practitioners to have a conversation with parents to encourage critical thinking about their infant's sleep environment and have a discussion about their values and beliefs regarding sleep safety.

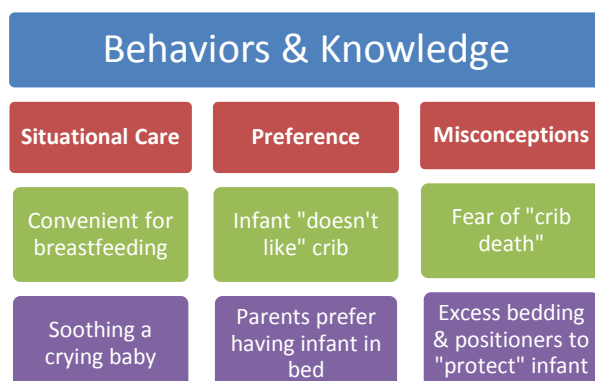
Another possibly related concern is that the program is anti-bonding. Again, this is false. It should be emphasized that mothers can spend time in bed with the infant whether to breastfeed or to bond, as long as mother is fully awake. Once the mother is feeling drowsy, the baby should be returned to the safety of the

crib. As stated above; **Room sharing, without bed sharing**, is meant to help facilitate the mother breastfeeding and bonding, while also providing for the infant's safety, by protecting the baby from suffocation, entrapment, or overlay.

A good resource for more information on these issues, is the La Leche League publication; "Sweet Sleep, Nighttime and Naptime Strategies for the Breastfeeding Family". It provides safe sleep advice (in alignment with those provided here) for families who have made the conscience decision to bed share or who, will eventually decide to bed share, once they have their infant home with them.

Understanding caregiver's behaviors and knowledge and the barriers for either following, or not following, the recommendations is critical to addressing the issue of safe infant sleep. It isn't necessarily only that new parents don't know the recommendations but, often they choose not to follow the recommendations due to misconceptions and beliefs.

The chart below helps to conceptualize reasons parents choose unsafe sleep behaviors that don't follow the AAP Recommendations.



A parent or caregiver's behavior is influenced by his or her knowledge but also by other factors including; situational care, preference, and safety

misconceptions. These are all areas that can be addressed and can be of value to parents to understand. Parents would like to be treated as if they are capable of making appropriate decisions regarding their child. Acknowledging their fears and misconceptions allows the parent to understand the situation which then helps to empower them in making healthy decisions for their child(ren).

Another area of importance, if resistance is received from parents, is that these recommendations are not forever. The most vital time for vigilance is the first 4 to 6 months. Once an infant is able to roll over back to front and front to back, studies show no need to reposition the baby. Additionally, the majority of SIDS/SUIDS deaths occur in infants under 6 months.

A true case study to demonstrate: "In the case of a 3-month-old boy found dead while sleeping alone in an adult bed despite a bassinet noted in the same room, his father had surrounded him with pillows to prevent him from rolling. Moreover, he was placed in prone position, and it was noted that the father had "placed baby on stomach because he had just fed him and 'he did not want the baby to spit up and choke' if he placed him face up."
(Hackett et al., 2014)

In the instance of the above case study, the father was trying to protect his child and keep him comfortable. The pillows however, caused an unsafe situation due to the possibility of suffocation. Laying the baby on his stomach and on an adult bed added additional risks. It is common for caregivers to lay their baby back to sleep and in a crib, at nighttime only. The baby is frequently laid on other surfaces for naptime and often, due to the perception of better comfort and fear of choking, the baby is laid on his stomach. Caregivers should be reminded that it is back to sleep, for every sleep.

Once staff has been adequately trained on the safe infant sleep, the new policy, and expectations, the hospital may choose to **reinforce hospital policy with visual aids such as floor decals and posters** (see attachment E for sample posters). Your hospital may also consider participating in the HALO In-Hospital SleepSack Program to replace receiving blankets with wearable blankets, and/or become a designated “Cribs for Kids” location to provide Pack N’ Play safe sleep kits to families in need. Contact the DPH Safe to Sleep Campaign Coordinator if you would like more information on any of these programs.

Special considerations: late preterm infants

Infants born at 34 0/7 through 36 6/7 weeks gestation, or “late-preterm” infants, are often the size and weight of some term infants (born at 37 0/7 – 41 6/7 weeks gestation). Because of this similar size, late-preterm infants may be treated by parents, caregivers, and health care professionals as though they are developmentally mature and at low risk of morbidity. They are often managed in newborn level 1 (basic) nurseries or remain with their mother after birth.

These babies are not fully developed. It is especially important that caregivers of these babies receive education on a safe sleep environment, including positioning the infant on his or her back during sleep and other newborn safety issues including car safety seat use, need for smoke/fire alarms, and hazards of secondhand tobacco smoke and environmental pollutants; (AAP, Clinical Report, 2007)

Step 6: Educate the Parent/Caregiver

Once staff has been trained, it is time to initiate counseling and education to new parents and their families and friends on safe infant sleep. This program aims to develop the ability of hospital staff working with new parents to “have a conversation” around the safe to sleep recommendations. This policy initiative is about more than handing a new parent a brochure on safe infant sleep. Parents and caregivers have questions surrounding the safe to sleep recommendations, especially when they are in conflict with, 1) the parent’s familial and cultural traditions, 2) situations viewed online or television and, 3) past experiences. Those who are willing to adopt the safe to sleep practices often need support for continuation of protective behaviors. There are identified barriers to the adoption of safe to sleep guidelines and these barriers often center around parents wanting to understand “why” they should lay their baby on his or her back and in a crib instead of on the couch. **Merely saying it is safer, is not adequate for behavior change.** The purpose of this type of policy/guideline change is to expand beyond the simplified education of flyers and brochures and to address the particular concerns of parents about safe to sleep recommendations. Below are some ideas:

- Have staff educate all new parents about the importance of providing a safe sleep environment. (see attachment E for sample educational materials)
- Ask all new parents to acknowledge they have received information about safe sleep. (see attachment F for a sample acknowledgement form)
- Provide a take-home **Safe to Sleep board book** for new parents to help reinforce the education provided. (a generous supply will be provided **free of charge**, upon request, while supplies last)
- Reinforce patient education with in-room posters.
- Request to join the **FREE In-Hospital Program** which includes:
 - **FREE** Specially designed HALO® SleepSack® Swaddle wearable blankets for in-hospital well baby nursery use, made of durable fabric with easy access to monitor leads.
 - **FREE** safe sleep educational materials for parents and staff training.
 - Marketing and public relations support materials.
- Request a **FREE HALO® Safe Sleep Resource Kit for Childbirth Educators, Safe Sleep Resource Kit Includes:**
 - HALO® SleepSack® Swaddle for classroom demonstrations (available in 100% cotton or micro-fleece)
 - HALO and First Candle/SIDS Alliance Safe Sleep Door Hangers (qty 50)
 - HALO and First Candle/SIDS Alliance Safe Sleep Brochures (qty 50)
 - Provide staff with a Safe to Sleep Educational Flipchart to assist with educating parents about Safe Sleep for Babies (Contact DPH Safe to Sleep Campaign Coordinator for a free copy)

Step 7: Audit

It is important to audit the newly implemented safe infant sleep policy in order to see what areas are working well and what areas may need some extra attention. This information can also be shared with hospital staff, administration, and other stakeholders to give feedback on efforts. A sample audit has been provided (Attachment H).

Programs in other states have included housekeeping as part of their policy implementation and education because they become vital in being that “second pair of eyes” to monitor caregiver practices when the infant is rooming in with the parent(s).

Step 8: Community and Media Outreach

Lastly, your hospital may wish to conduct Community and Media Outreach to further promote safe infant sleep and to show what a positive role model, and leader on infant safety, that your facility is committed to being for your community.

If you would like National recognition consider the - **Cribs for Kids® National Safe Sleep Hospital Certification**. There is no fee to apply and you may find more information on this 3 level certification program at; <http://www.cribsforkids.org/safesleephospitalcertification/applicationform/>

ATTACHMENTS

A POLICY & EDUCATION DEVELOPMENT GUIDE



THIS
SIDE
UP

GEORGIA
SAFE TO SLEEP
CAMPAIGN

Safe to Sleep Crib Audit Tool

If the baby is awake, please stop and return to complete evaluation when asleep.

Room # _____

Date: _____

1. Caregiver(s) present: Mother Father Other: _____

2. What is the status of the infant? (Please circle one)

Sleeping on back in crib	Sleeping on side in crib	*Sleeping held by sleeping adult	Sleeping in another device
Sleeping on stomach in crib	*Sleeping on/in caregivers bed	Sleeping held by an awake adult	Other (explain)

3. What item(s) are in the crib?

Clothing	Burp Cloths	Extra Blankets	Fluffy Blankets
Diapers	Pillow	Suction Bulb	Medical Equipment not in use
Stuffed toy	Pacifier	other loose items	Medical Equipment in use

*if yes, notify nurse



Georgia Safe to Sleep Program Pledge of Intent



NAME OF HOSPITAL: _____

Main Contact/Safe to Sleep Hospital Champion

Name: _____

Street Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

Hospital Shipping Address (For Gowns and other materials) Check box if the same as above: ☐

Street Address: _____

City, State, Zip: _____

Do you require inside delivery? _____ Y/N Do you have a loading dock? _____ Y/N Do you have storage space? _____ Y/N

Please read each of the statements below and check to indicate your agreement. This is a non-binding agreement. Then sign and return the form to the DPH Safe to Sleep Coordinator (contact information is below).

Our hospital agrees to:

- Develop an Infant Safe to Sleep Policy or Guidelines that align with the American Academy of Pediatrics, 2011 Clinic Report's, Level A Recommendations.
- Provide Infant Safe to Sleep training to all staff who provide care to infants, at least once a year.
- Implement Infant Safe to Sleep practices within the hospital according to the hospital policy/guidelines.
- Monitor staff compliance with Infant Safe to Sleep policy/guidelines at least twice a year.

The Georgia Department of Public Health, in response to the agreed upon 4 components above and upon the completion of a Safe to Sleep Hospital Policy or Guidelines, agrees to provide the hospital with the following items:

- Safe to Sleep educational materials (supplies are limited, subject to availability).
- Signed certificate indicating the Hospital's participation in the Georgia Safe to Sleep Campaign.
- Press release template for hospital usage.
- Access to a step by step guide and training materials via the DPH Safe to Sleep Campaign Coordinator.

If equipment is made available, our hospital would be interested in learning more about or receiving:

___Yes ___No One year supply of "this side up" infant gown for parents of newborns being discharged from the hospital

___Yes ___No One year supply of "Sleep Baby Safe and Snug" board book for parents of newborns being discharged from the hospital

___Yes ___No A limited supply of travel bassinets for parents of newborns.

Signature of Hospital Authorizing Official: _____ Title: _____

Printed name of Authorizing Official: _____

Signature of Safe to Sleep Champion: _____ Title: _____

Please Return Completed Form to: Georgia Dept. of Public Health, Safe to Sleep Coordinator via email at injury.prevention@dph.ga.gov or fax to 404-657-2911

HOSPITAL POLICY TEMPLATE

Why develop and implement a hospital safe to sleep policy?

- Sleep related deaths are a major, often preventable, burden of death to infants in Georgia and the United States.
- As of 2013, Georgia averaged 3 infant deaths a week due to sleep-related causes.
- It has been demonstrated that observing hospital staff utilizing safe sleep practices reinforces the behavior for parents when they return to their home.
- Hospitals have the ability to reach just about every new parent within the community.
- Nationally, and in the State of Georgia, African American infants die from unsafe sleep practices at a rate two to three times higher than Caucasian and Hispanic infants.
- Hospitals have the ability to become a regional leader in protecting infants and reducing preventable infant sleep-related deaths.
- Reducing infant deaths and increasing supine sleeping are objectives of Healthy People 2020.
- The American Academy of Pediatrics issued updated recommendations in October, 2011 on safer infant sleep practices.
- Role modeling and provider education have been demonstrated to lead to significant increases in adherence to safe infant sleep guidelines.

Statement of Purpose

To provide written guidance for hospitals and other health care facilities about implementing and modeling infant safe sleep protocols within their facility. These infant sleep practices should be followed for all healthy infants up to one year of age.

Goals:

To provide accurate and consistent infant safe sleep information to hospital personnel including medical, nursing, breastfeeding, child birth education, and nutrition staff.

To enable hospitals to implement and model infant safe sleep practices throughout their facility.

To provide guidance to healthcare staff about infant safe sleep concerns and issues.

Long Range Goals:

To provide direction to health care professionals so that safe sleep education for parents and other caregivers is consistent and repetitive.

To reduce infant mortality attributed to sleep environments.

AAP Recommendations:

American Academy of Pediatrics (AAP) Task Force on Sudden Infant Death expanded its recommendations on promotion of Safe Sleep Environments, October 2011

- Back to sleep for every sleep
- Use a firm sleep surface
- Room sharing without bed-sharing
- Keep soft objects and loose bedding out of crib
- Avoid smoke exposure during pregnancy and after birth
- Consider offering pacifier at naptime and bedtime
- Avoid overheating
- Avoid positioning devices
- Do not use cardiorespiratory monitors to reduce SIDS risk
- Mothers get prenatal care, avoid drugs and alcohol, vaccinate baby
- Health care professionals, staff in NBN and NICU's should endorse, model and teach SIDS risk reduction recommendations from birth
- All health care professionals should receive education on infant sleep

Evidence for these recommendations discussed in AAP Technical Report (2011)

Policy & Procedure:

Sleep Position: [Comments]

Sleep Surface: [Comments]

Bedding: [Comments]

Smoking, Drugs, Alcohol: [Comments]

Sleep Environment: [Comments]

Pacifier Use: [Comments]

Overheating/Over-bundling: [Comments]

NICU: [Comments]

Positioning Aids: [Comments]

Monitoring Devices: [Comments]

Tummy Time: [Comments]

Breastfeeding: [Comments]

Immunizations: [Comments]

Discharge Instructions: [Comments]

model *behavior*



Sample Policy & Procedures

Safe Sleep Practices for the Neonatal Intensive Care Unit

Parents tend to copy practices that they observe in hospital settings. As a nurse, you play a vital role in ensuring an infant's health and survival after they leave the hospital. This is the most important modeling job of your life.



Sample Policy & Procedures

Safe Sleep Practices for NICU

Scope of Responsibility:

All health care professionals caring for infants in the Neonatal Intensive Care Unit (NICU)

Goals:

1. To provide guidelines that will ensure a safe sleep environment for all newborns by implementing the American Academy of Pediatrics' (AAP) 2005 recommendations regarding safe sleep.
2. To ensure that all recommendations are modeled for and understood by parents/caregivers with consistent instructions given prior to discharge.

Purpose:

Sudden Infant Death Syndrome (SIDS) is a sudden and unexplained death that usually occurs while the infant is asleep. Highest risk is between the ages of 1 and 4 months. Although there is no conclusive research on the cause(s) of SIDS, safety measures such as positioning the infant on his/her back to sleep and other safe sleep guidelines have been shown to reduce the incidence of SIDS.

NICU Considerations

- Premature infants have increased risk of SIDS.
- Premature infants are more likely to be placed prone to sleep after hospital discharge.
- As parents/caretakers may see infants placed prone to sleep in the NICU, babies and parents/caretakers may become used to the prone sleep position.

Conclusion:

NICU staff should be more vigilant about endorsing and modeling the supine sleep position and safe sleep guidelines before an anticipated discharge.

Intervention

NICU

NICU Parent Education

Sleep Position

- Infants with PFC or pneumonia who have oxygen requirements may be tried to sleep on their stomachs to see if this improves oxygenation. If it does, they may be left on their stomachs until oxygen need decreases. They should then be changed to the supine sleep position.
- Infants who have decreased mobility due to illness, neurological defects, medication or restraints may be rotated to different positions to avoid certain problems, such as atelectasis until their condition improves. They should then be changed to the supine sleep position.
- Premature infants with respiratory problems and oxygen requirements may be tried in the prone position to see if it benefits them. If it does they may be left there but the infant should be checked daily to see if this continues to make a difference.
- Premature infants who have significant feeding residuals may be tried to sleep on their stomachs to see if it improves passage of food. The infant should be tried supine every few days to see if this remains a problem. If not, the infant should be placed permanently in the supine position. Infants handle reflux better on their backs.
- Infants with airway obstruction problems such as Pierre-Robin Sequence or laryngomalacia may require the prone sleep position until developmental changes in head shape and laryngeal function occur, usually requiring several months.
- Parents/caregivers need to be told that the stomach sleeping is temporary and they should be provided with sufficient explanation. The supine position should be modeled prior to discharge.
- Parents/caregivers need to be told that once well, infants need to always sleep on their backs and that carrying, play and supervised "tummy time" while awake are adequate stimulation for development. Parents/caregivers can rotate the infant's position in bed, but the infant should always be on his/her back.
- "Tummy time" is supervised playtime with the infant while he/she is awake and positioned on the tummy. This is important to infants' development by providing the opportunity for infants to learn to lift and turn their heads, exercise their bodies and strengthen the neck, arm and shoulder muscles.
- Changing the direction that your baby lies in the crib from week to week and supervised "tummy time" will reduce the incidence of positional plagiocephaly or flat spots on the infant's head.

Intervention

NICU

NICU Parent Education

Bedding/ Soft Materials (Blankets)

- Infants should not sleep on sheepskins or other very soft materials unless they are experiencing skin breakdown or are less than 32 weeks gestation. If an infant is placed to sleep on a sheepskin, he/she should sleep on their back.
- Infants should be frequently monitored visually, as well as electronically, for face down position. While on such bedding, they should be placed on their backs to sleep.
- "Boundaries" made from blanket rolls can serve as potential sources of airway obstruction and entrapment. They should not be used except in extreme cases such as PFC and extreme prematurity and only on open tables.
- No toys or stuffed animals are to be put in the crib, bassinet or isolette with the infant. Infants can be provided stimulation by visual patterns or pictures of the family on the isolette wall. Stuffed animals and toys should be displayed outside of the crib so that they will be available to the parents/caregivers to use to interact with the infant if appropriate when they visit.
- Once an infant has successfully graduated from the isolette, it is important to establish how many layers of clothing will be required to maintain thermal neutrality (warmth without overheating). If an undershirt, jumpsuit and sleeper are not adequate to keep an infant warm without additional blankets, the infant's readiness to be weaned from the isolette should be questioned.
- Staff should consider using a wearable blanket as an alternative to loose blankets and model its use for the parents/caregivers.
- Parents/caregivers must be told that these are temporary conditions that will be stopped once the skin matures and that under no circumstances are they to do this at home.
- Parents/caregivers need to be shown and told that no loose or soft items are to be in the crib, bassinet or isolette with the infant.
- Parents/caregivers should be encouraged to display toys outside of the crib.
- Parents/caregivers should be encouraged to bring in the various types of clothing they will use.
- Parents/caregivers should be asked to compare the normal temperature of their home with that of the NICU and figure out, along with the nursing staff, how to adjust the home environment or the infant's clothing. Parents/caregivers should be taught to look for signs of overheating such as fever and sweating and signs of being cold such as cold hands and skin mottling.
- Parents/caregivers can be encouraged to consider using a wearable blanket or dressing the infant in layers as an alternative to loose blankets.

Intervention

NICU

NICU Parent Education

Crib/Bedsharing (Breastfeeding)

- During rooming, it must be made clear that the infant is to sleep in a crib, bassinet or isolette. Bedsharing should not take place in the NICU.
- Parents should be carefully supervised during "kangaroo care," or if they are breastfeeding
- Parents/caregivers must be made aware of the multiple dangers of an infant sleeping in an adult bed prior to discharge. In addition, the extreme danger of bedsharing on couches and with other children must be pointed out.
- Parents should be informed that "kangaroo care" should be limited to the hospital setting.
- Parents/caregivers should be informed to place their infant to sleep in a crib or bassinet that meets the U.S. Consumer Product Safety Commission's safety standards. Nurses should emphasize that the crib should be firm.
- Parents should be encouraged to place the infant to sleep in the same room as the parents.
- It should be stressed that after going home, parent/caregiver interactions with the infant need to occur under safe conditions when both are awake and alert.
- The availability of bed-extendors and small cribs near the adult bed to facilitate breastfeeding should be addressed.

Swaddling/ Bundling

- Blankets used for swaddling should come no higher than the infant's shoulders.
- Parents/caregivers should be encouraged to speak with their physician about the need to swaddle. If the physician wants the infant swaddled, the nurse will need to demonstrate.

Intervention	NICU	NICU Parent Education
Smoking	<ul style="list-style-type: none"> Smoking is not allowed in the NICU and should not be introduced into the infants' environment. 	<ul style="list-style-type: none"> Parents/caregivers need to be made aware of the dangers of anyone smoking around the infant. Bedsharing may be more dangerous if the mother smokes and should be strongly warned against. Parents/caregivers should be encouraged to stop smoking and create a smoke-free environment for the infant.
Pacifier Use		<ul style="list-style-type: none"> Suggest to parents that they consider offering a pacifier at nap time and bedtime. Research shows that pacifier use during sleep is associated with a reduced risk of SIDS. Research also shows that the use of a pacifier does not interfere with breastfeeding nor cause dental problems. Explain to parents why they should wait one month before offering a pacifier to a breastfeeding baby. The risk of SIDS is very low during the first month and it is important to ensure that the baby is nursing well before introducing a pacifier. Tell parents not to use a pacifier as a substitute for nursing or feeding. Pacifiers should be offered after a feeding or when a baby is put down to sleep. Tell parents not to put a pacifier back in a baby's mouth if it falls out after he or she falls asleep. Doctors say that babies who use a pacifier at naptime and nighttime are protected, even if the pacifier falls out of their mouth after they fall asleep. Tell parents not to force their baby to take a pacifier if he or she does not want it. Encourage parents to try several times during a period of a few weeks before giving up.

Intervention	NICU	NICU Parent Education
<i>Pacifier Use (cont.)</i>		<ul style="list-style-type: none"> • Tell parents not to coat the pacifier with any sweet solutions. • Pacifiers should be cleaned often and replaced regularly. • Tell parents not to use a string or anything else to attach pacifiers around the baby's neck or to his or her clothing. • Tell parents to limit pacifier use to the baby's first year of life.



For more information, please call 1.800.221.7437 or visit www.firstcandle.org





UNIVERSITY of CALIFORNIA, SAN DIEGO
MEDICAL CENTER
Women & Infant Services

POLICY/PROCEDURE TITLE:

Safe Sleep for Infants

RELATED TO:

- ☐ Medical Center Policy (MCP) ☒ Nursing Practice Stds.
☐ JCAHO ☒ Patient Care Stds.
☐ QA ☐ Other
☐ Title 22

☐ ADMINISTRATIVE ☒ CLINICAL PAGE __ OF __

Effective date: 9/10

Revision date:

Reviewed date:

Unit/Department of Origin: FMCC

Other Approval: ISCC

POLICY STATEMENT: "SIDS" is a term used to describe the sudden death of an infant younger than one year of age that remains unexplained after a complete investigation. Nurses, physicians, other care providers, and caregivers have made significant progress in reducing the number of American infants who die each year by educating parents and caregivers about risk factors for SIDS. Although the US has seen a 50% decrease in the SIDS rate since AAP released its 1992 recommendation that infants be placed down for sleep in a nonprone position, SIDS remains the leading cause of death among US infants between one month and one year of age. Several studies show that the safe sleep message is not sufficiently reaching all infant caregivers.

Health care providers will educate families about SIDS risk factors and reinforce ways to reduce the risk. Health care providers will place infants to sleep on their backs and use other safe sleep practices while the infant is in the hospital to model the risk reduction recommendations.

RESPONSIBLE PARTY: All health care providers caring for infants.

PROCEDURE:

Safe Sleep Key Points For Parents:

1. **Always place your baby on his or her back to sleep, for naps and at night.** The back sleep position is the safest, and every sleep time counts.
2. **Place your baby on a firm sleep surface, such as on a safety-approved crib mattress, covered by a fitted sheet.** Never place your baby to sleep on pillows, quilts, sheepskins, or other soft surfaces.
3. **Keep soft objects, toys, and loose bedding out of your baby's sleep area.** Don't use pillows, blankets, quilts, sheepskins, or pillow-like crib bumpers in the baby's sleep area, and keep all objects away from your baby's face.
4. **Do not allow smoking around the baby.** Don't smoke before or after the birth of your baby, and don't let others smoke around the baby.
5. **Keep your baby's sleep area close to, but separate from, where you and others sleep.** Your baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you. If you bring your baby into bed with you to breastfeed, put him or her back in a separate sleep area, such as a bassinet, crib, cradle, or a bedside cosleeper when finished.
6. **Think about using a clean pacifier when placing the infant down to sleep,** but don't force the baby to take it. If you are breastfeeding, wait until your child is 1 month old or is used to breastfeeding before using a pacifier.
7. **Do not let your baby overheat during sleep.** Dress your baby in light sleep clothing, and keep the room at a temperature that is comfortable for an adult.

8. **Avoid products that claim to reduce the risk of SIDS** because most have not been tested for effectiveness or safety.
9. **Do not use home monitors to reduce the risk of SIDS.** If you have questions about using monitors for other conditions talk to your health care provider.
10. **Reduce the chance that flat spots will develop on your baby's head:** provide "Tummy Time" when your baby is awake and someone is watching; change the direction that your baby lies in the crib from one week to the next; and avoid too much time in car seats, carriers, and bouncers.

FMCC/Birth Center:

1. On infant's admission to the 4th floor, the nurse will provide written and verbal education regarding safe sleep in the hospital. A card will be placed on the crib regarding safe sleep practices.
2. Encourage frequent skin to skin (baby may be in prone position) when mom is awake. Other family members can be encouraged to place infant skin to skin if mother is sleeping or unable to hold the baby.
3. If mom is sleeping and another family member is not holding infant, the baby should be placed on his or her back in the bassinet. The bassinet should have only one blanket or chuck covering the mattress. There should be no pillows, toys or loose bedding in the bassinet.
4. Parents should be instructed to not let the baby sleep on a pillow or in the hospital bed if mother is sleepy, sleeping or unable to observe the baby.
5. On discharge, the nurse will provide written and verbal education regarding safe sleep at home.

ISCC:

1. All parents will receive written and verbal education regarding safe sleep in the hospital.
2. At approximately 35 weeks gestation, or as determined by the infant's care provider, an order will be given for "back to sleep" and the infant will be placed on his or her back to sleep on a firm mattress with only a blanket for warmth. There should be no pillows, rolls, toys or loose bedding in the bassinet/crib. At this time, a card will be placed on the crib regarding safe sleep practices.
3. On discharge, parents will receive additional education regarding a safe sleep environment at home.
4. Co-bedding: Although multiples are frequently co-bedded in the ISCC, it is not the recommendation of the health care providers that infants be co-bedded upon discharge. This includes co-bedding with one or any of the infants from the same pregnancy, other siblings, relatives, or parents. Parents are reminded that cobedding practices may lead to suffocation, and it is recommended that infants (including multiples) have separate and individual areas for sleep such as a crib, bassinette, or cradle.

REFERENCES:

American Academy of Pediatrics Policy Statement: The Changing Concept of Sudden Infant Death Syndrome: Diagnostic, Coding Shifts, Controversies Regarding the Sleeping Environment, and New Variables to Consider in Reducing Risk, 2005. *Pediatrics* 116:5 (1245-1255)

National Institute of Child Health and Human Development: Continuing Education Program on SIDS Risk Reduction. NIH Publications, 2006.



Sudden Infant Death
Syndrome (SIDS) and
Other Sleep-Related
Causes of Infant Death:

Questions and Answers for Health Care Providers



U.S. DEPARTMENT OF HEALTH AND
HUMAN SERVICES

National Institutes of Health
Eunice Kennedy Shriver National Institute
of Child Health and Human Development

Dear Colleague:

As Director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), I am pleased to provide this updated version of *Sudden Infant Death Syndrome (SIDS) and Other Sleep-Related Causes of Infant Death: Questions and Answers for Health Care Providers*. This booklet lists the latest recommendations on reducing the risk of SIDS and other sleep-related causes of infant death from the American Academy of Pediatrics (AAP) Task Force on SIDS and briefly describes the supporting research.

This piece is among several items that we offer as part of the Safe to Sleep® campaign, an expansion of the Back to Sleep campaign that addresses SIDS as well as other sleep-related causes of infant death.

Why the expanded campaign? Because although we have made great progress in reducing SIDS rates—more than 50 percent since the original AAP recommendation about back sleeping in 1992—there is still much to do. Based on their proportion in the U.S. population, African American and American Indian/Alaska Native infants are at higher risk for SIDS than are white or Hispanic infants. Further, as the SIDS rate has decreased, the rates of other sleep-related causes of infant death—such as accidental suffocation—have increased. As long as our babies are dying, we will continue these efforts.

Your contribution to reducing the risk of these deaths by sharing safe infant sleep messages is critical. Research shows that advice from health care providers makes an impact on parent and caregiver choices with regard to infant sleep position and infant sleep environment.

With this booklet, we aim to capitalize on your influence by providing you with answers to common questions about SIDS and other sleep-related causes of infant death and the scientific rationale that supports these answers, so you can alleviate concerns parents and caregivers might have. I encourage you to read this booklet and to discuss these messages with your patients, with families, and with anyone who cares for infants younger than 1 year of age.

Thank you for all you do to care for infants and to educate parents and caregivers about ways to reduce the risk of SIDS and other sleep-related causes of infant death. Let us continue this important work together to help ensure that all children grow into healthy adults.

Sincerely yours,

Alan E. Guttmacher, M.D.
Director, NICHD
National Institutes of Health
U.S. Department of Health and Human Services

Research shows: Health care provider advice MATTERS!

Since its beginnings, the Safe to Sleep® campaign (formerly the Back to Sleep campaign) has relied on research evidence as its foundation:

- Research, some of it supported by the NICHD, led to the 1992 recommendation from the American Academy of Pediatrics (AAP) Task Force on SIDS that infants be placed on their backs or sides to sleep to reduce the risk of SIDS.
- Research on the need for widespread education about SIDS and SIDS risk reduction led the NICHD, the AAP, and other collaborators to launch the Back to Sleep campaign in 1994.
- Additional research from the NICHD and other organizations led the AAP Task Force to issue a revised recommendation in 1996 saying that infants should be placed wholly on their backs—the sleep position associated with the lowest risk of SIDS—to reduce the risk of SIDS.
- After research and statistics showed that safe sleep messages were not reaching all groups equally—specifically that they weren't getting into African American and American Indian/Alaska Native communities—the NICHD and its collaborators began tailored outreach efforts to spread risk-reduction messages in these communities.
- Research findings led the NICHD and its collaborators to expand Back to Sleep into the Safe to Sleep® campaign to formally address issues related not only to SIDS, but also to other sleep-related causes of infant death, a safe infant sleep environment, and other infant health issues.



Now research confirms what we have known all along: Advice from health care providers makes a difference in parent and caregiver decisions about sleep position and sleep environment.

Parents and caregivers who took part in the NICHD-supported National Infant Sleep Position (NISP) study and other large-scale research efforts reported that advice from a health care provider influenced their decisions to place babies on their backs to sleep and to avoid sharing an adult bed with their baby.¹ Health care provider counseling is also known to influence other kinds of health-risk and health-promoting behaviors as well. For example, a large-scale review and meta-analysis found that advice on weight loss from primary care physicians



had a significant impact on patient attempts to change behaviors related to their weight.²

This booklet provides answers to common questions about safe infant sleep recommendations, as well as some of the research evidence and scientific references that support those recommendations. By informing all health care providers about SIDS, other sleep-related causes of infant death, such as accidental suffocation, and ways to reduce the risks for these situations, these important and life-saving messages can better reach parents and communities.

What advice should health care providers give to parents and caregivers about ways to reduce the risk of SIDS and other sleep-related causes of infant death?

Health care providers should encourage parents and other caregivers to reduce the risk of SIDS and other sleep-related causes of infant death in the following ways:

- **Always place baby on his or her back to sleep, for naps and at night, to reduce the risk of SIDS.** The back sleep position is always the safest position for all babies, including preterm babies. Keep in mind that every sleep time counts.
- **Use a firm sleep surface, such as a mattress in a safety-approved* crib, covered by a fitted sheet, to reduce the risk of SIDS and other sleep-related causes of infant death.** Firm sleep surfaces can include mattresses in safety-approved* cribs, bassinets, and portable play areas. Do not use a car seat, carrier, swing, or similar product as the baby's everyday sleep area. Never place babies to sleep on soft surfaces, such as on a couch or sofa, pillows, quilts, sheepskins, or blankets.

* For more information on crib safety guidelines, call the Consumer Product Safety Commission at 1-800-638-2772 or visit its website at <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/>.

- **Room sharing—keeping the baby's sleep area in the same room where you or others sleep—reduces the risk of SIDS.** Your baby should not sleep in an adult bed, on a couch, or on a chair alone, with you, or with anyone else. If you bring baby into your bed to feed, make sure to put him or her back in a separate sleep area, such as a safety-approved* crib, bassinet, or portable play area, in your room next to where you sleep when you are finished.



- **Keep soft objects, toys, crib bumpers, and loose bedding out of your baby's sleep area to reduce the risk of SIDS and other sleep-related causes of infant death.** Don't use pillows, blankets, quilts, sheepskins, or crib bumpers anywhere in your baby's sleep area. Evidence does not support using crib bumpers to prevent injury. In fact, crib bumpers can cause serious injuries and even death. Keeping them out of baby's sleep area is the best way to avoid these dangers.



- **To reduce the risk of SIDS, women should:**
 - » Get regular health care during pregnancy, and
 - » Not smoke, drink alcohol, or use illegal drugs during pregnancy or after the baby is born.
- **To reduce the risk of SIDS, do not smoke during pregnancy, and do not smoke or allow smoking around your baby.**
- **Breastfeed your baby to reduce the risk of SIDS.** Breastfeeding has many health benefits for mother and infant. If you bring your baby into your bed to breastfeed, make sure to put him or her back in a separate sleep area, such as a safety-approved* crib, bassinet, or portable play area, in your room next to where you sleep when you are finished.
- **Give your baby a dry pacifier that is not attached to a string for naps and at night to reduce the risk of SIDS.** But don't force the baby to use it. If the pacifier falls out of the baby's mouth during sleep, there is no need to put the pacifier back in. Wait until the baby is used to breastfeeding before trying a pacifier.

- **Do not let your baby get too hot during sleep.** Dress your child in no more than one layer of clothing more than an adult would wear to be comfortable. Keep the room at a temperature that is comfortable for an adult.
- **Follow your health care provider's guidance on your baby's vaccines and regular health checkups.**
- **Avoid products that claim to reduce the risk of SIDS and other sleep-related causes of infant death.** These wedges, positioners, and other products have not been tested for safety or effectiveness.
- **Do not use home heart or breathing monitors to reduce the risk of SIDS.** If you have questions about using monitors for other health conditions, talk with your child's health care provider.
- **Give your infant plenty of Tummy Time when he or she is awake, and when someone is watching.** Supervised Tummy Time helps the baby's neck, shoulder, and arm muscles get stronger. It also helps to prevent flat spots on the back of your baby's head. Holding the baby upright and limiting time in carriers and bouncers can also help prevent flat spots on the back of the baby's head.

What is SIDS?

SIDS is defined as the sudden death of an infant younger than 1 year of age that remains unexplained after a thorough case investigation, including performance of a complete autopsy, thorough examination of the death scene, and review of the infant's and family's clinical histories.³

SIDS is associated with a sleep period but is unpredictable. It is often referred to as a "diagnosis of exclusion" because it is determined only after ruling out other causes of death, including suffocation, infection, or other illnesses. A diagnosis of SIDS is made by collecting information and conducting forensic tests, and by talking with parents, other caregivers, and health care providers.⁴ In the absence of an identifiable cause of death after this process, infant fatalities may be diagnosed as SIDS.⁵

What are Sudden Unexpected Infant Death (SUID) and sleep-related causes of infant death?

SIDS is not the cause of every sudden infant death. Each year in the United States, thousands of infants die suddenly of no immediately obvious cause. These deaths are classified as **SUID**. SUID is the death of an infant younger than 1 year of age that occurs suddenly and unexpectedly.

SUID includes all unexpected deaths: Those without a clear cause, such as SIDS, and those from a known cause, such as accidental suffocation. Many unexpected infant deaths are accidents, but a disease or another external factor, such as poisoning or neglect, can also cause an infant to die unexpectedly. One-half of SUID cases are SIDS.⁶

Sleep-related causes of infant death are those linked to how or where a baby sleeps or slept. They are due to accidental causes, such as: Suffocation; entrapment, when baby gets trapped between two objects, such as a mattress and wall, and can't breathe; or strangulation, when something presses on or wraps around baby's neck, blocking baby's airway. These deaths are not SIDS.

What sleep position is safest for term babies in hospital nurseries?

Healthy babies who are born at term **should be placed wholly on their backs to sleep in hospital nurseries.**

Keep in mind that term includes early term (37 or 38 weeks) births, full-term (39 or 40 weeks) births, or late-term (41 or 42 weeks) births.^{7,8} Research shows that mothers and caregivers often use the same sleep position for their babies at home that they see being used at the hospital.^{9,10} Therefore, all hospital nursery personnel should place babies on their backs to sleep—for naps and at night.



Nursery staff sometimes believe that newborn infants need be on their sides to clear their airways of amniotic fluid. There is no evidence to suggest that such fluid is cleared more readily while in the side position. The AAP recommends

that infants be placed on their backs as soon as they are ready to be placed in a bassinet.¹¹

Health care providers should also expressly tell parents and caregivers that babies should sleep on their backs for all sleep times, for naps and at night, once they go home to reduce the risk of SIDS.

Should preterm infants be placed on their backs for sleep?



Yes. Research shows that preterm infants are at higher risk for SIDS simply because they were born preterm, defined as before 37 weeks' gestation; therefore, placing preterm infants on their backs for sleep is a critically important way to reduce the risk of SIDS.^{12, 13}

Preterm infants who have active respiratory disease may have improved oxygenation if they are placed on their stomachs. Thus, the stomach sleep position during acute respiratory disease may be appropriate for infants in a highly monitored, inpatient setting. Because preterm babies often

remain in the hospital for several days to weeks before discharge, the AAP Task Force recommends that these infants be placed on their backs to sleep as soon as possible after the respiratory condition has stabilized.¹⁴ This practice will allow parents and caregivers to become familiar with the position they should use at home.

In addition, providers should clearly state and strongly recommend that parents and caregivers be especially diligent about making sure their infants are placed in the back sleep position for every sleep time to reduce the risk of SIDS. Epidemiological studies have shown that, when placed on their stomachs to sleep at home, low birth weight or preterm babies may be at higher risk for SIDS than babies born at or after 37 weeks' gestational age.¹⁵

Is the side position as effective as the back sleep position in reducing the risk of SIDS?

No, the side position is not considered a safe alternative to the back sleep position. Studies show that the side sleep position is unstable and increases the chance that infants will roll onto their stomachs—the sleep position associated with the highest SIDS risk.¹⁶

The AAP Task Force recommends that infants be placed **wholly on their backs** to sleep for naps and at night to reduce the risk of SIDS.

Can infants be placed to sleep on their stomachs for naps or for short periods of rest?

This practice is not recommended. Studies show that babies who are used to sleeping on their backs, but who are then placed on their stomachs or sides to sleep, such as for a nap, are at *significantly* higher risk for SIDS.¹⁷ This risk is actually greater—sometimes seven to eight times greater—than that of infants who are always placed on their stomachs or sides to sleep.¹⁸

Evidence suggests that secondary caregivers and child care providers are not always aware of the increased risk from unaccustomed sleep position.^{19, 20} Therefore, health care providers, parents, and caregivers need to be very clear in recommending that everyone who cares for baby—including grandparents, child care providers, and babysitters—knows that babies should be placed on their backs to sleep for naps and at night, and that every sleep time counts.

Are there any circumstances when babies should be placed on their stomachs to sleep?

Healthy babies should always be placed on their backs to sleep for naps and at night.

Babies with certain upper-airway malformations (e.g., Robin syndrome) may have acute airway obstructive episodes that are relieved by prone positioning.²¹ However, these cases are rare; health care providers should clearly state the reasons for the prone recommendation to the parents and caregivers in these cases.

There has been concern about aspiration among babies diagnosed with gastroesophageal reflux who are placed in the back position for sleep. Current evidence suggests that even infants with gastroesophageal reflux should be placed on their backs to sleep, with the rare exception of infants for whom the risk of death from gastroesophageal reflux is greater than the risk of SIDS.²²

There may be other infants for whom the risk/benefit balance favors stomach sleeping. Health care providers should consider the potential benefit to the infant when recommending sleep position.

If medical personnel determine that the stomach sleep position is necessary because of a medical condition or other concern, health care providers should advise parents and caregivers to reduce the risk of SIDS in other ways, such as by avoiding soft bedding and ensuring that infants do not overheat during sleep. For most infants, however, stomach and side sleeping are not advised.²³

Will babies aspirate if they regurgitate while sleeping on their backs?

There is no evidence that aspiration is more common among healthy infants who sleep in the supine position than among healthy infants who sleep in the prone position.^{24, 25} Furthermore, in countries (including the United States) that have seen a major change in infant sleep position—from mainly stomach sleeping to mostly back sleeping—the incidence of serious or fatal choking has not increased.²⁶

In fact, babies may actually clear secretions better when placed on their backs. When babies are in the back sleep position, the trachea lies on top of the esophagus (see Figure 1). Anything regurgitated or refluxed from the esophagus must work against gravity to be aspirated into the trachea.

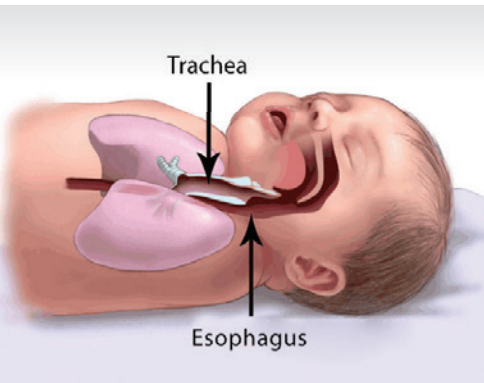


Figure 1

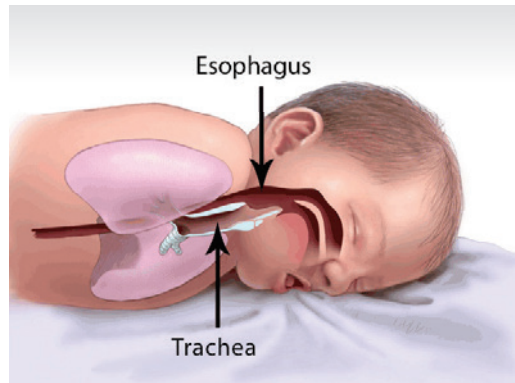


Figure 2

Conversely, when an infant is in the stomach sleep position, anything regurgitated or refluxed will pool at the opening of the trachea, making it easier for the infant to aspirate (see Figure 2). Also, chemosensitive tissue that initiates the reflex is more prominent on the posterior versus anterior pharyngeal wall, thus suggesting an even greater protection against aspiration when the baby is lying on his or her back.

Of the very few reported cases of death due to choking, most of the infants were in the stomach sleep position.

Should parents or caregivers be advised to reposition their infant if he or she rolls onto the stomach from the back position?

Studies show that, during early infancy, it is unusual for a baby who is placed in the back sleep position to roll onto his or her stomach.²⁷ However, once infants are more developmentally advanced, they often roll over on their own. In this situation, when infants roll over on their own, there is no evidence that they need to be repositioned to reduce the risk of SIDS. It is most important that the infant starts sleep in the back sleep position for every sleep time. Keeping the sleep area clear of soft or loose bedding also increases safety for the infant if he or she rolls onto the stomach.

What is the best sleep surface for reducing the risk of SIDS and other sleep-related causes of infant death?

A firm sleep surface, such as a mattress in a safety-approved* crib, bassinet, or portable play area, covered by a fitted sheet, is associated with the lowest risk of SIDS and other sleep-related causes of infant death.

Sleeping on soft surfaces or soft bedding, such as quilts, duvets, and pillows, is associated with increased risk of SIDS. Sleeping under soft bedding, particularly pillows, quilts, and extra bedding, is also associated with increased risk of accidental suffocation.²⁸

* For more information on crib safety guidelines, call the Consumer Product Safety Commission at 1-800-638-2772 or visit its website at <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/>.



In addition, infants should not be placed on adult mattresses, beds, sofas, or chairs for sleep. These surfaces are typically softer than mattresses in safety-approved* cribs. Consequently, they pose additional risks for other sleep-related causes of infant death, such as entrapment (between the mattress and the wall) and accidental suffocation.

Car seats and other sitting devices, such as strollers, swings, infant carriers, and infant slings (for extended sleep periods), also are not recommended for routine sleep, but this recommendation is related more to sleep

position than to sleep surface. Infants younger than 1 month who are placed in sitting devices for sleep might be at increased risk of upper airway obstruction and oxygen desaturation.²⁹ Increased rates of injuries resulting from car seats being placed on elevated surfaces and then falling have also been reported; in some cases, this situation results in suffocation.

Does bed sharing reduce the risk of SIDS?

Current evidence does not support bed sharing as a protective strategy against SIDS. On the contrary, evidence is growing that bed sharing increases the risk for SIDS and other sleep-related causes of infant death, such as accidental suffocation and entrapment, or injury.



A mother room sharing with her infant.

To communicate the risk of SIDS and other sleep-related causes of infant death to parents and caregivers effectively, it is important to understand the meanings of the terms—bed sharing, co-sleeping, and room sharing—defined below.

■ **Room sharing:** When an infant sleeps in the same room as parents, but in a separate sleep area, such as a crib, bassinet, or play yard next to an adult bed. **Room sharing is known to reduce the risk of SIDS and other sleep-related causes of infant death and is recommended by the AAP.**

- **Bed sharing:** When an infant sleeps on the same surface as another person. This surface can be a bed, couch, or chair. Sleeping with a baby in an adult bed increases the risk of accidental suffocation and other sleep-related causes of infant death.
- **Co-sleeping:** When a parent and infant sleep in close proximity to one another, either on the same surface or on different surfaces. This is done so that they are able to see, hear, and/or touch each other. Co-sleeping can refer to either room sharing or bed sharing.

Bed sharing and co-sleeping are often used interchangeably, but they mean different things. Room sharing is a fairly new term and is recommended by the AAP to aid in feeding, comforting, and monitoring the infant. Room sharing without bed sharing has also been shown to reduce the risk of SIDS by half.

Bed sharing among infants and family members, particularly among adults and infants, is common in many cultures.³⁰ Many mothers share a bed with their infants because it makes breastfeeding easier and enhances bonding. Even though some believe that bed sharing may reduce the risk of SIDS because the parent is nearby to monitor the baby, *studies do not support bed sharing as a protective strategy for SIDS.*³¹

Bed sharing is very risky when:

- The adult smokes cigarettes or has consumed alcohol or medication that causes drowsiness.^{32, 33, 34}
- The baby shares a bed with other people or with more than one person.^{35, 36}
- The sleep surface is a couch or sofa.^{37, 38, 39}
- The baby is younger than 11 to 14 weeks of age.^{40, 41, 42}
- The mattress on the shared adult bed is softer than a safety-approved* crib mattress.^{43, 44}

* For more information on crib safety guidelines, call the Consumer Product Safety Commission at 1-800-638-2772 or visit its website at <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/>.

Does bed sharing reduce the risk of other sleep-related causes of infant death?

No. Sleeping with a baby in an adult bed increases the chance for overlay or suffocation.

Room sharing—having baby's sleep area in the same room where parents sleep—is less risky than bed sharing because it eliminates the possibility of an adult rolling on to the baby and other similar injuries. It is also recommended by the AAP. Sharing a room with baby allows for easy monitoring and offers many bonding opportunities. It also makes breastfeeding easier.

Mothers who bring baby into their bed to feed should return the infant to a separate sleep area, such as a safety-approved* crib, in their room next to where they sleep.

Can twins and multiples be placed in the same crib or bassinet to sleep?

Twins and higher-order multiples should have separate sleep areas. The potential for overheating and rebreathing is higher among infants who share a bed, increasing the chance of accidental suffocation. In addition, most twins who share a bed are placed on their sides to sleep rather than on the back, putting them at increased risk for SIDS.⁴⁵

Co-bedding twins and higher-order multiples in the hospital setting might encourage parents to continue this practice at home. Therefore, infants should be placed in their own bassinets in the hospital nursery as soon as possible after birth. Parents and caregivers should also be advised to provide separate sleep areas in the home.

* For more information on crib safety guidelines, call the Consumer Product Safety Commission at 1-800-638-2772 or visit its website at <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/>.

Should crib bumpers be used in the baby's sleep area?

No. Evidence does not support using crib bumpers (sometimes called bumper pads) or similar products that attach to the crib sides or slats to prevent injury. Statistics actually suggest the products may be harmful. A recent study of crib injuries concluded that the risk of suffocation or strangulation from using crib bumpers far outweighed the potential benefits of using them to prevent minor injuries.⁴⁶ In fact, crib bumpers can cause serious injuries and even death. Stricter crib safety standards requiring crib slat spacing to be less than $2\frac{3}{8}$ inches eliminated the need to use the bumpers to prevent infants from falling through the slats.⁴⁷

Is it safe to put other items in the crib, such as blankets or stuffed toys?

Parents and caregivers should be advised to keep soft objects, toys, and loose bedding out of the infant's sleep area. Loose bedding and other items in the baby's sleep area could end up covering the baby's face. This puts the baby at higher risk for rebreathing air that is low in oxygen and for suffocation or strangulation.⁴⁸ Pillows, quilts, comforters, sheepskins, and other soft items are hazardous when placed under the infant or loose in the infant's sleep area. Research shows that they can increase the risk for SIDS up to fivefold, regardless of the sleep position.

Can swaddling reduce the risk of SIDS?

Research on whether swaddling—wrapping the infant in a light blanket—might reduce the risk for SIDS is inconclusive. Many cultures and nurseries have traditionally used swaddling as a strategy to soothe infants, and in some cases, encourage sleep in the back position. However, statistics clearly show that incorrect swaddling can lead to injury and sometimes death. Studies have found that incorrect swaddling can cause hip and shoulder dysplasia, head covering, and strangulation.⁴⁹ Parents and caregivers should be advised to use caution if they decide to swaddle an infant. Swaddling also does not reduce the necessity to follow other recommended safe sleep practices. The AAP offers guidelines for safe swaddling at <http://www.healthychildren.org/English/ages-stages/baby/diapers-clothing/pages/Swaddling-Is-it-Safe.aspx>.

Does prenatal care play a role in reducing the risk of SIDS?



There is evidence linking a lower risk of SIDS with obtaining regular prenatal care.⁵⁰ Risk of SIDS is particularly increased for women who seek prenatal care late in their pregnancy, that is, in the third trimester, or not at all.⁵¹ Women should seek prenatal care early in the pregnancy and continue to obtain regular prenatal care during the entire pregnancy.

How do smoking during pregnancy and second-hand smoke in the pregnant woman's and infant's environment affect the risk of SIDS?

Smoking during pregnancy and smoke in the infant's environment contribute to an increased SIDS risk.^{52, 53} In fact:

- Infants whose mothers smoke during or after pregnancy are at an overall greater risk of SIDS.⁵⁴
- Infants born to mothers who smoked during pregnancy are twice as likely to die of SIDS.⁵⁵
- Exposure to passive smoke in the household doubles a baby's SIDS risk.⁵⁶

Exactly how smoking during pregnancy and passive smoke in the environment increase SIDS risk is not clear, but smoking may negatively affect development of the fetal nervous system. Studies of the mechanisms underlying the association between smoking and SIDS have found that during the last half of pregnancy changes occur in nicotine-binding sites in the fetal brain stem, specifically in areas involved with arousal from sleep, heart and breathing functions, sleep, and body movement control.⁵⁷ Also, infants whose mothers smoked during pregnancy and who died from SIDS had a higher nicotine concentration in their lung tissue than do infants who did not die from SIDS.⁵⁸ This finding supports the statement that postnatal environmental tobacco smoke exposure plays a role in SIDS risk.^{59,60} However, the mechanism for the association between thirdhand smoke and SIDS is unknown.

Does maternal substance use—smoking, alcohol, and illicit drugs—during pregnancy or after delivery affect SIDS risk?

Evidence shows that women who smoke, drink alcohol, or use illegal drugs during pregnancy or after the baby is born put their infant at increased risk of SIDS. Maternal smoking during pregnancy is a major risk factor in almost every epidemiologic study of SIDS.⁶¹ Similarly, an infant's exposure to alcohol and illicit drugs in the womb increases his or her risk of SIDS. One study of Northern Plains American Indians found that alcohol consumption (particularly binge drinking) during the periconceptional phase and the first trimester were associated with increased SIDS risk.⁶² Another study showed infants were at increased risk for SIDS when their mother used cocaine or other illicit drugs while pregnant.⁶³ For these and other reasons, women should not smoke, drink, or use drugs during pregnancy or after delivery.

Does breastfeeding reduce the risk of SIDS?

Studies show that babies who are breastfed are at lower risk of SIDS than are nonbreastfed babies.^{64, 65, 66} The evidence in these published reports supports the protective role of breastfeeding on SIDS. In one of the cited reports, this protective effect was more pronounced with exclusive breastfeeding.

Physiologic studies show that breastfed infants are more easily aroused from sleep than their formula-fed counterparts, which might explain some of the protective effect of breastfeeding against SIDS.⁶⁷

In addition, breastfeeding offers other health benefits, including decreased incidence of diarrhea, upper and lower respiratory infections, and other infectious diseases, which are associated with an increased susceptibility to SIDS.⁶⁸

The AAP recommends that, unless contraindicated by health problems, women exclusively breastfeed their infants for at least the first 6 months after birth.⁶⁹



Do pacifiers reduce the risk of SIDS?



Yes. Several studies have found that infants who used pacifiers during their last sleep were at significantly lower risk of SIDS compared with infants who did not use pacifiers.^{70, 71} A meta-analysis reinforced findings of the protective effect of pacifiers against SIDS.⁷² The protective effect persists throughout the sleep period, even if the pacifier falls out of the infant's mouth. The exact mechanism for this protective effect is unclear, but lowered sleep arousal thresholds, favorable modification of autonomic control during sleep, and maintaining airway patency during sleep have been proposed.⁷³

The AAP Task Force recommends the use of pacifiers within the following parameters:

- Parents and caregivers should offer the pacifier, but should not force the infant to take it if she or he refuses it.
- Pacifiers should be clean and dry and not coated with anything sweet or sticky.
- Pacifiers should not be attached to infant clothing by a string or tether.
- If the pacifier falls out of the infant's mouth during sleep, there is no need to reinsert it.
- Parents should wait until breastfeeding is well established before introducing a pacifier.

If blankets and other items should not be used in the sleep area, how can parents and caregivers keep their baby warm during sleep?

Babies should be kept warm during sleep, but not too warm. Studies show that an overheated baby is more likely to go into a deep sleep from which it is difficult to arouse.^{74, 75, 76, 77, 78} Some evidence indicates that increased SIDS risk is associated with excessive clothing or blankets and a higher room temperature.

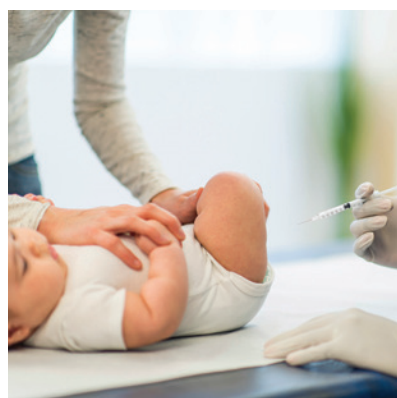
In general, if the room temperature is comfortable for an adult, then it is also warm enough for an infant.⁷⁹ Parents and caregivers should be advised to dress the baby in no more than one layer more of clothing than an adult would wear to be comfortable. Infant sleep clothing, such as a wearable blanket or one-piece sleeper, can be used to keep the baby warm during sleep without using a blanket in the sleep area.

The increased retention of body heat—through excessive insulation from bedding and clothing—can be dangerous for some infants and may contribute to SIDS.^{80, 81} Head covering during sleep is a particular concern. One study found a sevenfold increase in the risk of SIDS associated with head covering.⁸² Studies have also found that overheating may increase the risk of SIDS for a baby who has a cold or infection.⁸³

Do vaccinations have a protective effect against SIDS?

Receiving recommended vaccinations may have a protective effect against SIDS. Some research shows that immunizations reduce the risk of SIDS by 50 percent.⁸⁴ Additional research has shown no causal relationship between immunizations and SIDS.

Advising parents to follow the vaccination schedule and attend all well-baby visits will help ensure infants are immunized and monitored according to AAP and Centers for Disease Control and Prevention recommendations. See the immunization schedule published by the Advisory Committee on Immunization Practices at <http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html>.



Can use of products such as wedges and positioners prevent SIDS?

Wedges, positioners, and other devices that claim to be able to prevent SIDS or correctly position infants for sleep are not recommended. These products have not been tested for safety or effectiveness. In fact, the Consumer Product Safety Commission (CPSC) has reports of deaths attributable to accidental suffocation and entrapment associated with wedges and positioning devices. Most of these deaths occurred when infants were placed in the prone or side-lying position with these devices. The infant can roll onto his or her stomach and become trapped and suffocate between the device and side of the crib or bassinet. Also, the infant's movement can cause the nose and mouth to press into or underneath the device, posing a risk for suffocation. This is particularly true for products made with foam rubber or Memory Foam™.

The U.S. Food and Drug Administration, the CPSC, and the AAP warn against using any of these products because of the dangers they pose to babies. To read the warning, visit <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm227575.htm>.

Does electronic cardiorespiratory monitoring prevent or detect SIDS?

No. Such monitors are not recommended as a strategy for preventing or detecting SIDS.

In the past, health care providers considered the use of cardiorespiratory monitors for reducing SIDS risk in certain groups, such as siblings in families that had previously lost a child from SIDS. However, no national consensus deems this practice as necessary or effective. The NICHD-funded Collaborative Home Infant Monitoring Evaluation (CHIME) study, which used specially designed electronic monitors in the home to detect cardiorespiratory events in infants, raised serious questions about the relationship between SIDS and events detected by home monitors.⁸⁶ For this reason, home monitors are not recommended as a way to reduce the risk of SIDS.

The AAP Task Force supports the conclusions from the CHIME study in recommending against using home monitors as a strategy to prevent SIDS.^{86, 87}

There may still be circumstances in which clinicians will prescribe a home monitor for an infant who has already had a life-threatening event or for those considered at particularly high risk for airway obstruction, such as those with

persistent apnea of prematurity, those with congenital airway malformations, or those who are being positioned prone during sleep for specific medical or surgical reasons. These monitors are not prescribed to prevent or detect SIDS.

Does back sleeping cause positional plagiocephaly or brachycephaly?

Plagiocephaly—a flattened or misshapen head—can occur for various reasons. Positional plagiocephaly results from an infant being placed in the same position (usually on the back) for long periods of time. Brachycephaly (flattening of the back of the skull) may occur along with positional plagiocephaly. The primary causes of positional plagiocephaly and brachycephaly are: Too little time spent upright; too little Tummy Time when the baby is awake and supervised; and too much time in car seats, carriers, and bouncers.

Positional plagiocephaly and brachycephaly are usually harmless and often disappear on their own within the months after babies start to sit up. There is no evidence to suggest that such flat spots are harmful to infants or that they are associated with any permanent effects on head shape.^{88, 89}

Many cases of positional plagiocephaly can be prevented (and sometimes corrected) by repositioning, which relieves pressure from the back of an infant's head.⁹⁰ Techniques for repositioning include:

- Alternating the baby's head position when he or she is placed to sleep so that the baby is not always sleeping on the same side of the head
- Changing the direction the baby faces in the crib every week or so (feet at one end of the crib one week, at the other end of the crib the next week)
- Periodically moving the crib around the room so the infant has to turn his or her head in different directions to see what is going on
- Getting “cuddle time” with the baby by holding him or her upright over one shoulder often during the day
- Limiting the amount of time the baby spends in car seats, carriers, swings, and bouncy seats

In addition, getting ample supervised Tummy Time is also important for reducing the likelihood of positional plagiocephaly.

Positional plagiocephaly is very different from craniosynostosis (premature fusion of the sutures of the skull), congenital muscular torticollis (twisted

neck present at birth), and other types of plagiocephaly. These other types of plagiocephaly often require special molding helmets or surgery to correct.⁹¹

Can babies ever be placed on their stomachs?



Yes. Infants need Tummy Time when they are awake and when someone is watching them. Supervised Tummy Time strengthens muscles in the shoulders and neck that help infants to achieve developmental milestones. It also helps to prevent flat spots on the infant's head.

Health care providers should advise parents and caregivers that a certain amount of Tummy Time is a very important and necessary part of an infant's development. Infants need two or three sessions of supervised Tummy Time every day. Older babies need even more Tummy

Time to help their bodies get ready to sit up, roll over, crawl, and walk. Tummy Time should begin as early as possible to promote motor development, facilitate development of the upper body muscles, and minimize the risk of positional plagiocephaly.⁹²

What advice should health care providers give to parents or caregivers whose infants have difficulty sleeping in the back position?

Although the baby's comfort is important, safety is more important. Parents and caregivers should be advised to place infants on their backs to sleep even if they seem less comfortable or sleep more lightly than when on their stomachs. It is helpful to understand that, compared with infants sleeping on their backs, infants who are placed on their stomachs sleep more deeply, are less reactive to noise, experience less movement, and are less able to arouse from sleep. It is theorized that these factors may put an infant at higher risk of SIDS.

It is true that some infants who lie on their backs do not sleep as deeply as those who lie on their stomachs. Similarly, infants who are placed on their backs to sleep may be fussy or cry. For information you can share with parents about how to help babies get to sleep while on their backs and sleep through the

night, visit <http://www.healthychildren.org/english/ages-stages/baby/sleep/Pages/default.aspx>.

Moreover, while some parents report that using swings or swaddling helps to calm babies, there are no large studies showing efficacy of these practices in reducing the risk of SIDS.⁹³ It also is important to note that swaddling does not reduce the necessity to follow other recommended safe infant sleep practices.



For babies in child care, what advice should health care providers give to parents and caregivers about reducing the risk of SIDS?

Health care providers should strongly recommend that parents and caregivers be especially diligent about making sure infants are placed to sleep on their backs with nothing else in the sleep area, for every sleep time: For naps, at night, **and while in child care**. Consider the following:

- NICHD-supported research and other studies found that infants who are accustomed to sleeping on their backs but who are then placed to sleep on their stomachs or sides are at very high risk of SIDS.⁹⁴ This risk is actually greater than the increased SIDS risk experienced by infants who are always placed on their stomachs or sides to sleep.⁹⁵ If parents and caregivers place an infant to sleep on his or her back at home, but child care providers use a different sleep position, the infant is at significantly higher risk for SIDS.
- In the United States, approximately 20 percent of SIDS deaths occur while the infant is in the care of a child care provider.⁹⁶ This finding is significant, given that more than 61 percent of children younger than 5 years of age are in some type of child care at least some of the time.⁹⁷
- Many child care deaths are associated with the stomach sleep position, especially when the infant is unaccustomed to being placed in that position for sleep.



- Despite the Safe to Sleep® campaign (formerly Back to Sleep) and other SIDS and safe infant sleep awareness campaigns, many child care providers continue to place infants to sleep on their stomachs. Surveys have documented that some secondary caregivers, even licensed child care center workers, are either unaware of or are misinformed about the dangers of placing infants to sleep on their stomachs.⁹⁸
- Although child care providers are more likely to use the back sleep position when centers have written sleep policies, licensed child care centers seldom have such policies.⁹⁹ Studies have found that education programs for child care providers are effective both in increasing knowledge of safe infant sleep positioning and in promoting the development of written policies on sleep position.¹⁰⁰

Based on the evidence, consistency in sleep position is extremely important for reducing the risk of SIDS. It is crucial that parents and caregivers tell everyone who cares for their baby—including grandparents, child care providers, and babysitters—that the infant be placed on his or her back for every sleep time, for naps and at night.

At what age can parents and caregivers stop placing infants on their backs to sleep to reduce the risk of SIDS?

SIDS is defined as the sudden unexplained death of an infant younger than 1 year of age that remains unexplained after a thorough investigation.¹⁰¹ Parents and caregivers should continue to place babies on their backs to sleep until their first birthday.

Statistics indicate that the first 6 months after birth, when infants are forming their sleeping habits, are probably the most important in terms of using the back sleep position to reduce SIDS risk.¹⁰² Research shows that 90 percent of SIDS deaths occur in infants younger than 6 months of age, with a peak between 1 month and 4 months of age.¹⁰³

However, SIDS can occur at any time during an infant's first year, so parents and caregivers should continue to be advised to use back sleeping and other ways to reduce the risk of SIDS and other sleep-related causes of infant death until their baby's first birthday.

Spread the word!

As a health care provider, you have multiple and unique opportunities to share safe infant sleep messages with parents and caregivers to help reduce the risk of SIDS and other sleep-related causes of infant death. Specifically:

- **Always place infants on their backs to sleep.** The back sleep position carries the lowest risk of SIDS.
- **Every sleep time counts.** Infants accustomed to sleeping on their back who are then placed on their stomachs to sleep are at significantly higher risk for SIDS.
- **Sleep surface matters.** Infants who sleep *on top of* an adult bed or *under* soft surfaces (such as blankets or quilts) are at higher risk for SIDS and other sleep-related causes of infant death.

Communities across the nation have made great progress in sharing safe infant sleep messages! With your help, we can spread these important messages to every community in the nation.



References

- ¹ Colson, E. R., Willinger, M., Rybin, D., Heeren, T., Smith, L. A., Lister, G., et al. (2013). Trends and factors associated with infant bed sharing, 1993-2010: The National Infant Sleep Position Study. *JAMA Pediatrics*, 167(11), 1032–1037.
- ² Rose, S. A., Poynter, P. S., Anderson, J. Q., Noar, S. M., & Conigliaro, J. (2013). Physician weight loss advice and patient weight loss behavior change: A literature review and meta-analysis of survey data. *International Journal of Obesity*, 37(1), 118–128.
- ³ Willinger, M., James, L. S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11(5), 677–684.
- ⁴ Valdes-Dapera, M. (1995). The postmortem evaluation. *Pediatric Annals*, 24(7), 365-372.
- ⁵ Willinger, M., James, L. S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11(5), 677–684.
- ⁶ Centers for Disease Control and Prevention, HHS. (2012). Sudden infant death syndrome. Retrieved March 28, 2014, from <http://www.cdc.gov/sids>.
- ⁷ Spong, C. Y. (2013). Defining “term” pregnancy: Recommendations from the Defining “Term” Pregnancy Workgroup. *Journal of the American Medical Association*, 309(23) 2445–2446.
- ⁸ American College of Obstetricians and Gynecologists, Committee on Obstetric Practice, Society for Maternal-Fetal Medicine. (2013). Committee Opinion: Definition of Term Pregnancy. Retrieved May 16, 2014, from http://www.acog.org/Resources_And_Publications/Committee_Opinions/Committee_on_Obstetric_Practice/Definition_of_Term_Pregnancy.
- ⁹ Pastore, G., Guala, A., Zaffaroni, M., & Bona, G. (2003). Back to Sleep: Risk factors for SIDS as targets for public health campaigns. *Pediatrics*, 109(4), 453–454.
- ¹⁰ Colson, E. R., & Joslin, S. C. (2002). Changing nursery practice gets inner-city infants in the supine position for sleep. *Archives of Pediatrics & Adolescent Medicine*, 156(7), 717–720.
- ¹¹ American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.

- ¹² Bhat, R. Y., Hannam, S., Pressler, R., Rafferty, G. F., Peacock, J. L., & Greenough, A. (2006). Effect of prone and supine position on sleep, apneas, and arousal in preterm infants. *Pediatrics*, 118(1), 101–107.
- ¹³ Ariagno, R. L., van Liempt, S., & Mirmiran, M. (2006). Fewer spontaneous arousals during prone sleep in preterm infants at 1 and 3 months corrected age. *Journal of Perinatology*, 26(5), 306–312.
- ¹⁴ Bhat, R. Y., Hannam, S., Pressler, R., Rafferty, G. F., Peacock, J. L., & Greenough, A. (2006). Effect of prone and supine position on sleep, apneas, and arousal in preterm infants. *Pediatrics*, 118(1), 101–107.
- ¹⁵ Oyen, N., Markestad, T., Skjaerven, R., Irgens, L. M., Helweg-Larsen, K., Alm, B., et al. (1997). Combined effects of sleeping position and prenatal risk factors in sudden infant death syndrome: The Nordic Epidemiological SIDS Study. *Pediatrics*, 100(4), 613–621.
- ¹⁶ Li, D. K., Petitti, D., Willinger, M., McMahon, R., Odouli, R., Vu, H., et al. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
- ¹⁷ Li, D. K., Petitti, D. B., Willinger, M., McMahon, R., Odouli, R., Vu, H., et al. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
- ¹⁸ Mitchell, E. A., Thach, B. T., Thompson, J. M., & Williams, S. (1999). Changing infants' sleep position increases risk of sudden infant death syndrome: New Zealand Cot Death Study. *Archives of Pediatrics & Adolescent Medicine*, 153(11), 1136–1141.
- ¹⁹ Gershon, N. B., & Moon, R. Y. (1997). Infant sleep position in licensed child care centers. *Pediatrics*, 100(1), 75–78.
- ²⁰ Moon, R. Y., Weese-Mayer, D. E., & Silvestri, J. M. (2003). Nighttime child care: Inadequate sudden infant death syndrome risk factor knowledge, practice, and policies. *Pediatrics*, 111(4 pt 1), 795–799.
- ²¹ Kattwinkel, J. (ed.) (2010). *Textbook of Neonatal Resuscitation*, 6th Edition. Elk Grove Village, IL: American Academy of Pediatrics and American Heart Association.
- ²² Vandenplas, Y., Rudolph, C. D., Di Lorenzo, C., Hassall, E., Liptak, G., Mazur, L., et al. (2009). Pediatric gastroesophageal reflux clinical practice guidelines: Joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN). *Journal of Pediatric Gastroenterology and Nutrition*, 49(4), 498–547.
- ²³ American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.
- ²⁴ Hunt, C. E., Lesko, S. M., Vezina, R. M., McCoy, R., Corwin, M. J., Mandell, F., et al. (2003). Infant sleep position and associated health outcomes. *Archives of Pediatrics & Adolescent Medicine*, 157(5), 469–474.

- ²⁵ Malloy, M. H. (2002). Trends in postneonatal aspiration deaths and reclassification of sudden infant death syndrome: Impact of the "Back to Sleep" program. *Pediatrics*, 109(4), 661–665.
- ²⁶ Malloy, M. H. (2002). Trends in postneonatal aspiration deaths and reclassification of sudden infant death syndrome: Impact of the "Back to Sleep" program. *Pediatrics*, 109(4), 661–665.
- ²⁷ Li, D. K., Petitti, D. B., Willinger, M., McMahon, R., Odouli, R., Vu, H., et al. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
- ²⁸ Kemp, J. S., Unger, B., Wilkins, D., Psara, R. M., Ledbetter, T. L., Graham, M. A., et al. (2000). Unsafe sleep practices and an analysis of bed-sharing among infants dying suddenly and unexpectedly: Results of a four-year, population-based, death-scene investigation study of sudden infant death syndrome and related deaths. *Pediatrics*, 106(3), E41.
- ²⁹ Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Merrick Moore, C., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(5 pt 2), 1207–1214.
- ³⁰ Colson, E. R., Willinger, M., Rybin, D., Heeren, T., Smith, L. A., Lister, G., et al. (2013). Trends and factors associated with infant bed sharing, 1993–2010: The National Infant Sleep Position Study. *JAMA Pediatrics*, 167(11), 1032–1037.
- ³¹ Colson, E. R., Willinger, M., Rybin, D., Heeren, T., Smith, L. A., Lister, G., et al. (2013). Trends and factors associated with infant bed sharing, 1993–2010: The National Infant Sleep Position Study. *JAMA Pediatrics*, 167(11), 1032–1037.
- ³² McGarvey, C., McDonnell, M., Hamilton, K., O'Regan, M., & Matthews, T. (2006). An 8-year study of risk factors for SIDS: Bed-sharing vs. non-bed-sharing. *Archives of Disease in Childhood*, 91(4), 318–323.
- ³³ Carpenter, R. G., Irgens, L. M., Blair, P. S., England, P. D., Fleming, P., Huber, J., et al. (2004). Sudden unexplained infant death in 20 regions in Europe: Case control study. *Lancet*, 363(9404), 185–191.
- ³⁴ Blair, P. S., Sidebotham, P., Evason-Coombe, C., Edmonds, M., Heckstall-Smith, E. M., & Fleming, P. (2009). Hazardous cosleeping environments and risk factors amenable to change: Case-control study of SIDS in south west England. *British Medical Journal*, 339, b3666.
- ³⁵ Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Merrick Moore, C., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(5 pt 2), 1207–1214.
- ³⁶ Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Merrick Moore, C., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(5 pt 2), 1207–1214.

- ³⁷ Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Merrick Moore, C., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(5 pt 2), 1207–1214.
- ³⁸ Tappin, D., Ecob, R., & Brooke, H. (2005). Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case control study. *Journal of Pediatrics*, 147, 32–37.
- ³⁹ McGarvey, C., McDonnell, M., Chong, A., O'Regan, M., & Matthews, T. (2003). Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland. *Archives of Disease in Childhood*, 88, 1058–1064.
- ⁴⁰ Tappin, D., Ecob, R., & Brooke, H. (2005). Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case control study. *Journal of Pediatrics*, 147, 32–37.
- ⁴¹ McGarvey, C., McDonnell, M., Chong, A., O'Regan, M., & Matthews, T. (2003). Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland. *Archives of Disease in Childhood*, 88, 1058–1064.
- ⁴² McGarvey, C., McDonnell, M., Hamilton, K., O'Regan, M., & Matthews T. (2006). An 8-year study of risk factors for SIDS: Bed-sharing vs. non-bed-sharing. *Archives of Disease in Childhood*, 91(4), 318–323.
- ⁴³ Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Merrick Moore, C., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(5 pt 2), 1207–1214.
- ⁴⁴ Fu, L. Y., Hauck, F. R., & Moon, R. (2010). Bed sharing among black infants and sudden infant death syndrome: Interactions with other known risk factors. *Academic Pediatrics*, 10, 376–382.
- ⁴⁵ Hutchison, B. L., Steward, A. W., & Mitchell, E. A. (2010). The prevalence of cobedding and SIDS-related child care practices in twins. *European Journal of Pediatrics*, 169(12), 1477–1485.
- ⁴⁶ Yeh, E. S., Rochette, L. M., McKenzie, L. B., & Smith, G. A. (2011). Injuries associated with cribs, playpens, and bassinets among young children in the U.S., 1990–2008. *Pediatrics*, 127(3), 479–486.
- ⁴⁷ Consumer Product Safety Commission. The safe nursery. Retrieved March 28, 2014, from <http://www.cpsc.gov/cpscpub/pubs/202.pdf>. (PDF – 604 KB)
- ⁴⁸ Kemp, J. S., Unger, B., Wilkins, D., Psara, R. M., Ledbetter, T. L., Graham, M. A., et al. (2000). Unsafe sleep practices and an analysis of bed-sharing among infants dying suddenly and unexpectedly: Results of a four-year, population-based, death-scene investigation study of sudden infant death syndrome and related deaths. *Pediatrics*, 106(3), E41.
- ⁴⁹ Richardson, H. L., Walker, A. M., & Horne, R. S. (2010). Influence of swaddling experience on spontaneous arousal patterns and autonomic control in sleeping infants. *Journal of Pediatrics*, 157(1), 85–91.

- ⁵⁰ Getahun, D., Amre, D., Rhoads, G. G., & Demissie, K. (2004). Maternal and obstetric risk factors for sudden infant death syndrome in the United States. *Obstetrics & Gynecology*, 103, 646–652.
- ⁵¹ Paris, C., Remler, R., & Daling, J. R. (2001). Risk factors for sudden infant death syndrome: Changes associated with sleep position recommendations. *Journal of Pediatrics*, 139(6), 771–777.
- ⁵² Adgent, M. A. (2006). Environmental tobacco smoke and sudden infant death syndrome: A review. *Birth Defects Research Part B: Developmental and Reproductive Toxicology*, 77(1), 69–85.
- ⁵³ Wigle, D. T., Arbuckle, T. E., Turner, M. C., Berube, A., Yang, Q., Liu, S., et al. (2008). Epidemiological evidence of relationships between reproductive and child health outcomes and environmental chemical contaminants. *Journal of Toxicology and Environmental Health, Part B: Critical Reviews*, 11(5-6), 373–517.
- ⁵⁴ Zhanga, K., & Wang, X. (2013). Maternal smoking and increased risk of sudden infant death syndrome: A meta-analysis. *Legal Medicine*, 15(3), 115–121.
- ⁵⁵ Anderson, H. R., & Cook, D. G. (1997). Passive smoking and sudden infant death syndrome: Review of the epidemiological evidence. *Thorax*, 52, 1003–1009.
- ⁵⁶ Zhanga, K., & Wang, X. (2013). Maternal smoking and increased risk of sudden infant death syndrome: A meta-analysis. *Legal Medicine*, 15(3), 115–121.
- ⁵⁷ U.S. Department of Health and Human Services. (2006). *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Retrieved March 28, 2014, from http://www.cdc.gov/tobacco/data_statistics/sgr/2006/index.htm.
- ⁵⁸ McMartin, K. I., Platt, M. S., Hackman, R., Klein, J., Smialek, J. E., Vigorito, R., et al. (2002). Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS). *Journal of Pediatrics*, 140(2), 205–209.
- ⁵⁹ McMartin, K. I., Platt, M. S., Hackman, R., Klein, J., Smialek, J. E., Vigorito, R., et al. (2002). Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS). *Journal of Pediatrics*, 140(2), 205–209.
- ⁶⁰ Anderson, H. R., & Cook, D. G. (1999). Passive smoking and sudden infant death syndrome: Review of the epidemiological evidence. *Thorax*, 54, 365–366.
- ⁶¹ Zhanga, K., & Wang, X. (2013). Maternal smoking and increased risk of sudden infant death syndrome: A meta-analysis. *Legal Medicine*, 15(3), 115–121.
- ⁶² Iyasu, S., Randall, L. L., Welty, T. K., Hsia, J., Kinney, H. C., Mandell, F., et al. (2002). Risk factors for sudden infant death syndrome among Northern Plains Indians. *Journal of the American Medical Association*, 288, 2717–2723.

- ⁶³ Fares, I., McCulloch, K. M., & Raju, T. N. (1997). Intrauterine cocaine exposure and the risk for sudden infant death syndrome: A meta-analysis. *Journal of Perinatology*, 17(3), 179–182.
- ⁶⁴ Ip, S., Chung, M., Raman, G., Trikalinos, T. A., & Lau, J. (2009). A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries. *Breastfeeding Medicine*, 4(Suppl. 1), S17–S30.
- ⁶⁵ Vennemann, M. M., Bajanowski, T., Brinkmann, B., Yucesan, K., Sauerland, C., & Mitchell, E. A.; GeSID Study Group. (2009). Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics*, 123(3), e406–e410.
- ⁶⁶ Hauck, F. R., Thompson, J., Tanabe, K. O., Moon, R. Y., & Vennemann, M. M. (2011). Breastfeeding and reduced risk of sudden infant death syndrome: A meta-analysis. *Pediatrics*, 128(1), 103–110.
- ⁶⁷ Duijts, L., Jaddoe, V. W., Hofman, A., & Moll, H. A. (2010). Prolonged and exclusive breastfeeding reduces the risk of infectious diseases in infancy. *Pediatrics*, 126(1), e18–e25.
- ⁶⁸ Paris, C., Remler, R., & Daling, J. R. (2001). Risk factors for sudden infant death syndrome: Changes associated with sleep position recommendations. *Journal of Pediatrics*, 139(6), 771–777.
- ⁶⁹ American Academy of Pediatrics. (2012). Policy statement: Breastfeeding and the use of human milk. *Pediatrics*, 129(3), e827–e841.
- ⁷⁰ Moon, R. Y., Tanabe, K. O., Yang, D. C., Young, H. A., & Hauck, F. R. (2011). Pacifier use and SIDS: Evidence for a consistently reduced risk. *Maternal and Child Health Journal*, 16(3), 609–614.
- ⁷¹ Hauck, F. R., Hauck, O. O., & Siadat, M. S. (2005). Do pacifiers reduce the risk of sudden infant death syndrome? A meta-analysis. *Pediatrics*, 116(5), 716–723.
- ⁷² Franco, P., Scaillet, S., Wermenbol, V., Valente, F., Groswasser, J., & Kahn, A. (2000). The influence of a pacifier on infants' arousals from sleep. *Journal of Pediatrics*, 136(6), 775–779.
- ⁷³ Hunt, C. E., & Puczyński, M. S. (1996). Does supine sleeping cause asymmetric heads? *Pediatrics*, 98(1), 127–129.
- ⁷⁴ Fleming, P. J., Gilbert, R., & Azaz, Y. (1990). Interaction between bedding and sleeping position in the sudden infant death syndrome: A population-based case-control study. *British Medical Journal*, 301, 85–89.
- ⁷⁵ Gilbert, R., Rudd, P., & Berry, P. J. (1992). Combined effect of infection and heavy wrapping on the risk of sudden unexpected infant death. *Archives of Disease in Childhood*, 67, 171–177.
- ⁷⁶ Ponsonby, A. L., Dwyer, T., Gibbons, L., Cochrane, J. A., Jones, M. E., & McCall, M. J. (1992). Thermal environment and SIDS: Case-control study. *British Medical Journal*, 304, 277–282.

- ⁷⁷ Ponsonby, A. L., Dwyer, T., Gibbons, L. E., Cochrane, J. A., & Wang, Y. G. (1993). Factors potentiating the risk of sudden infant death syndrome associated with prone position. *New England Journal of Medicine*, 329, 377–382.
- ⁷⁸ Williams, S. M., Taylor, B. J., & Mitchell, E. A. (1996). Sudden infant death syndrome: Insulation from bedding and clothing and its effect modifiers. *International Journal of Epidemiology*, 25, 277–282.
- ⁷⁹ American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.
- ⁸⁰ Ponsonby, A. L., Dwyer, T., Gibbons, L. E., Cochrane, J. A., & Wang, Y. G. (1993). Factors potentiating the risk of sudden infant death syndrome associated with the prone position. *New England Journal of Medicine*, 329, 377–382.
- ⁸¹ Williams, S. M., Taylor, B. J., & Mitchell, E. A. (1996). Sudden infant death syndrome: Insulation from bedding and clothing and its effect modifiers. *International Journal of Epidemiology*, 25, 366–375.
- ⁸² Blair, P. S., Mitchell, E. A., Heckstall-Smith, E. M., & Fleming, P. J. (2008). Head covering—A major modifiable risk factor for sudden infant death syndrome: A systematic review. *Archives of Disease in Childhood*, 93(9), 778–783.
- ⁸³ Williams, S. M., Taylor, B. J., & Mitchell, E. A. (1996). Sudden infant death syndrome: Insulation from bedding and clothing and its effect modifiers. *International Journal of Epidemiology*, 25, 366–375.
- ⁸⁴ Vennemann, M. M., Höffgen, M., Bajanowski, T., Hense, H. W., & Mitchell, E. A. (2007). Do immunisations reduce the risk for SIDS? A meta-analysis. *Vaccine*, 25(26), 4875–4879.
- ⁸⁵ Ramanathan, R., Corwin, M. J., Hunt, C. E., Lister, G., Tinsley, L. R., Baird, T., et al.; Collaborative Home Infant Monitoring Evaluation (CHIME) Study Group. (2001). Cardiorespiratory events recorded on home monitors: Comparison of healthy infants with those at increased risk for SIDS. *Journal of the American Medical Association*, 285(17), 2199–2207.
- ⁸⁶ American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.
- ⁸⁷ National Institutes of Health Consensus Development Conference on Infantile Apnea and Home Monitoring, Sept 29 to Oct 1, 1986. (1987). *Pediatrics*, 79(2), 292–299.
- ⁸⁸ American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.
- ⁸⁹ Laughlin, J., Luerksen, T. G., Dias, M. S.; Committee on Practice and Ambulatory Medicine, Section on Neurological Surgery, et al. (2011). Prevention and management of positional skull deformities in infants. *Pediatrics*, 128(6), 1236–1241.

- ⁹⁰ Laughlin, J., Luerssen, T. G., Dias, M. S.; Committee on Practice and Ambulatory Medicine, Section on Neurological Surgery, et al. (2011). Prevention and management of positional skull deformities in infants. *Pediatrics*, 128(6), 1236–1241.
- ⁹¹ Laughlin, J., Luerssen, T. G., Dias, M. S.; Committee on Practice and Ambulatory Medicine, Section on Neurological Surgery, et al. (2011). Prevention and management of positional skull deformities in infants. *Pediatrics*, 128(6), 1236–1241.
- ⁹² American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2011). Policy statement: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), 2011–2084.
- ⁹³ Gerard, C. M., Harris, K. A., & Thach, B. T. (2002). Physiologic studies on swaddling: An ancient child care practice, which may promote the supine position for infant sleep. *Journal of Pediatrics*, 141(3), 398–404.
- ⁹⁴ Harper, R. M., Kinney, H. C., Fleming, P. J., & Thach, B. T. (2000). Sleep influences on homeostatic functions: Implications for sudden infant death syndrome. *Respiration Physiology*, 119(2–3), 123–132.
- ⁹⁵ Li, D. K., Petitti, D., Willinger, M., McMahon, R., Odouli, R., Vu, H., et al. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
- ⁹⁶ Moon, R. Y., Kotch, L., & Aird, L. (2006). State child care regulations regarding infant sleep environment since the Healthy Child Care America—Back to Sleep campaign. *Pediatrics*, 118(1), 73–83.
- ⁹⁷ Laughlin, L. (2013). *Who's minding the kids? Child care arrangements: Spring 2011*. Current Population Reports, P70–135. Washington, DC: U.S. Census Bureau. Retrieved May 16, 2014, from <http://www.census.gov/prod/2013pubs/p70-135.pdf>. (PDF – 635 KB)
- ⁹⁸ Moon, R. Y., Kotch, L., & Aird, L. (2006). State child care regulations regarding infant sleep environment since the Healthy Child Care America—Back to Sleep campaign. *Pediatrics*, 118(1), 73–83.
- ⁹⁹ Moon, R. Y., Kotch, L., & Aird, L. (2006). State child care regulations regarding infant sleep environment since the Healthy Child Care America—Back to Sleep campaign. *Pediatrics*, 118(1), 73–83.
- ¹⁰⁰ Moon, R. Y., Kotch, L., & Aird, L. (2006). State child care regulations regarding infant sleep environment since the Healthy Child Care America—Back to Sleep campaign. *Pediatrics*, 118(1), 73–83.
- ¹⁰¹ Willinger, M., James, L. S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11, 677–684.

- ¹⁰² Trachtenberg, F. L., Haas, E. A., Kinney, H. C., Stanley, C., & Krous, H. F. (2012). Risk factor changes for sudden infant death syndrome after initiation of Back-to-Sleep campaign. *Pediatrics*, 129(4), 630–638.
- ¹⁰³ Trachtenberg, F. L., Haas, E. A., Kinney, H. C., Stanley, C., & Krous, H. F. (2012). Risk factor changes for sudden infant death syndrome after initiation of Back-to-Sleep campaign. *Pediatrics*, 129(4), 630–638.

For more information, contact the
Safe to Sleep[®] campaign:

Phone: 1-800-505-CRIB (2742)

Email: NICHDInformationResourceCenter@mail.nih.gov

Website: <http://safetosleep.nichd.nih.gov>

Fax: 1-866-760-5947

Mail: P.O. Box 3006, Rockville, MD 20847

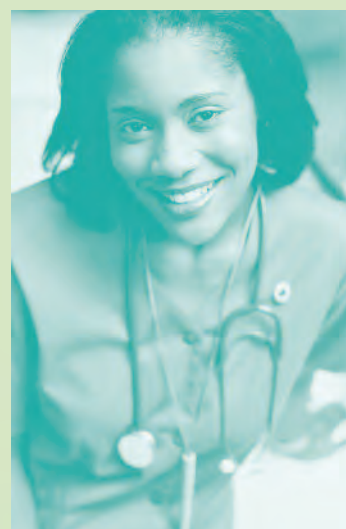


Eunice Kennedy Shriver National Institute
of Child Health and Human Development

NIH Pub. No. 14-7202

August 2014

Continuing Education Program on
SIDS *Risk* Reduction



SUDDEN INFANT DEATH SYNDROME (SIDS) ACT OF 1974

The SIDS Act of 1974 (P.L. 93-270) made the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) (formerly the National Institute of Child Health) responsible for conducting research into the causes of SIDS as well as for developing and implementing a program of public information and educational materials about SIDS risk reduction. The NICHD and other government agencies maintain a number of public health programs to deliver SIDS information and materials to families and health care providers across the United States. As mandated by the Act, agencies conducting this work provide an annual report to Congress on SIDS research, information, and counseling projects.

BACK TO SLEEP CAMPAIGN

Since its inception in 1994, the *Back to Sleep* campaign has focused on raising awareness among parents, health care providers, and caregivers about the importance of putting babies to sleep on their backs for naps and at night to reduce the risk of SIDS. Over the course of the campaign, the NICHD and its partners have distributed millions of brochures, posters, public service announcements, and informational videos explaining this message.

Since the launch of the campaign, SIDS deaths in the United States have declined by more than 50 percent. But significant disparities still exist. African American infants are more than two times as likely to die of SIDS as white infants, and American Indian/Alaska Native infants are nearly three times as likely to die of SIDS as white infants. In an effort to reach minority and underserved populations with the message about the importance of placing infants on their backs to sleep, the NICHD has partnered with organizations that serve these communities. As part of this outreach, the NICHD publishes *The NICHD Community Connection*, a newsletter that keeps the *Back to Sleep* campaign's African American outreach partners well informed about the latest research on SIDS and related outreach activities. You may obtain a free copy of the newsletter by calling 1-800-505-CRIB, or by visiting <http://www.nichd.nih.gov/SIDS>. The NICHD is also working with American Indian/Alaska Native partners to develop adaptable, culturally appropriate SIDS risk-reduction materials that reflect American Indian/Alaska Native daily life.

The *Back to Sleep* campaign is led by the NICHD and is co-sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration, the American Academy of Pediatrics, First Candle/SIDS Alliance, and the Association of SIDS and Infant Mortality Programs.

FIRST CANDLE/SIDS ALLIANCE

First Candle/SIDS Alliance is a key partner in this continuing education program and is conducting live training sessions for this program at nursing conferences across the country. The mission of First Candle/SIDS Alliance is to promote infant health and survival during the prenatal period through two years of age by providing advocacy, education, and research programs. First Candle believes it is essential that everyone working with infants understand the importance of life-saving messages for reducing the risk of SIDS and other accidental infant deaths. Consistency of care—from parent to caregiver and from nighttime to naptime—is a priority for First Candle.

Continuing Education Program on
SIDS *Risk* Reduction

Welcome

Dear Colleague:

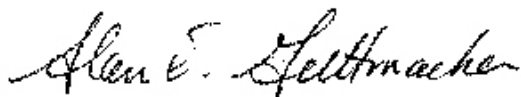
As Director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), I am pleased to present this nurses' continuing education (CE) program on Sudden Infant Death Syndrome (SIDS) risk reduction. Since the launch of the *Back to Sleep* campaign in 1994, you and your co-workers around the country have made tremendous progress in helping to reduce the incidence of SIDS. In fact, SIDS deaths in the United States have declined by more than 50 percent in the last 10 years. This is a remarkable accomplishment, but there is still progress to be made. African American infants are still twice as likely to die of SIDS as are white infants. The rate of SIDS in American Indian/Alaska Native populations is almost three times higher than the rate of SIDS in white populations. There are many people like you who are working hard to protect the health and well-being of our babies, and together we can make a difference.

To be effective, each of us must have the knowledge and information to help reduce the risk of SIDS and to ensure that our babies have the opportunity to grow up healthy and strong. We need to continue to make sure that our messages reach every parent, grandparent, and caregiver in every community across the nation. There is a role for each of us to learn more about SIDS and to share what we learn with our families, friends, neighbors, and communities.

In partnership with several nursing organizations, First Candle/SIDS Alliance, and the National Institute of Nursing Research, the NICHD has designed this CE offering to provide you with the information and tools necessary to effectively communicate SIDS risk-reduction messages.

Thank you for all you have done to educate families about SIDS and to help reduce the risk in your communities. Working together, we have made great progress. Let's continue to work together to help all infants grow into healthy adults.

Sincerely yours,

A handwritten signature in black ink that reads "Alan E. Guttmacher". The signature is written in a cursive, flowing style.

Alan E. Guttmacher, M.D.
Director, NICHD



Contents

INTRODUCTION 2

PRE-TEST 4

SESSION 1 5

What You Need To Know About Sudden Infant Death Syndrome (SIDS)

- **Lesson 1:** Understanding SIDS
- **Lesson 2:** Understanding SIDS Risk
- **Lesson 3:** Reducing SIDS Risk

SESSION 2 19

How To Communicate SIDS Risk-Reduction Techniques to Parents and Caregivers

- **Lesson 1:** Nurses as Role Models for Parents
- **Lesson 2:** Challenges to SIDS Risk Reduction
- **Lesson 3:** Communicating About SIDS Risk Reduction

ADDITIONAL RESOURCES 33

ACKNOWLEDGMENTS 33

PRE-TEST ANSWER KEY 33

REFERENCES 34



Introduction

The *Continuing Education Program on SIDS Risk Reduction: Curriculum for Nurses* is designed to inform pediatric, obstetric, and neonatal nurses—as well as all nurses who educate family members and caregivers about caring for infants—of the latest risk-reduction strategies for SIDS. It is also designed to increase nurses' knowledge of ways to communicate SIDS risk-reduction information to parents and caregivers.

Learning Objectives

Upon completion of the continuing education (CE) materials, nurses will be able to:

1. Define SIDS, including the:

- Etiology of SIDS (triple-risk theory);
- Risk factors for SIDS (prenatal risk factors, developmental risk factors, and environmental risk factors); and
- Epidemiology of SIDS (SIDS rates, disparities in SIDS rates, and the decline in U.S. SIDS rates since 1992).

2. List the critical SIDS risk-reduction messages for parents and caregivers, including:

- Back to sleep;
- Firm sleep surface;
- Safe sleep environment (no fluffy bedding or stuffed toys);
- No smoking around the baby;
- A close but separate sleep area for the baby;
- Possible use of a clean, dry pacifier;
- Avoidance of overheating the baby;
- Avoidance of products that claim to reduce the risk of SIDS;
- Avoidance of home monitor use to reduce the risk of SIDS;
- Avoidance of positional plagiocephaly (the appearance of persistent flat spots on the baby's head), including guidelines for Tummy Time; and
- Talking to parents, child care providers, grandparents, babysitters, and everyone who cares for the baby about SIDS risk.

3. List four barriers to back sleeping, including:

- Regurgitation/aspiration concerns;
- Deep sleep;
- Plagiocephaly; and
- Contrary advice from a relative or caregiver.

4. Describe their key role as educators to parents and caregivers about SIDS, including the importance of:

- Knowing the safe sleep message; and
- Spreading and practicing the safe sleep message.

5. Describe ways that nurses can effectively communicate SIDS risk-reduction messages to parents and caregivers such as how to:

- Counter common arguments against back sleeping;
- Respond to questions about SIDS;
- Encourage parents to take action; and
- Deliver messages.

About This Program

This CE program, designed to be used as a self-study course, includes:

- A **pre-test**. The pre-test on page 4 is designed to measure baseline knowledge about SIDS and to help identify content areas that require more focus. It is not scored for CE credit. The pre-test answer key is on page 33.
- **Two educational sessions**.
- A **post-test**. The post-test can be found in the pocket on the back inside cover of this manual. It is intended to evaluate achievement of the learning objectives listed above and is scored for CE credit.
- A **program evaluation**. The program evaluation is also in the pocket on the back inside cover of this manual. Completing this form is required for CE credit and will help the CE sponsors to refine the program.

How To Receive CE Credit

This education activity for 1.1 contact hours is approved by the Maryland Nurses Association (MNA). The MNA is an accredited approver of continuing education (CE) by the American Nurses Credentialing Center Commission on Accreditation.

To receive CE credit, nurses should first read both educational sessions. Then, they should complete the post-test. A score of 70 percent or better is required; that is, 7 of the 10 questions must be answered correctly in order to receive CE credit. After scoring the post-test, nurses should complete the program evaluation.

Nurses seeking CE credit are then required to submit the post-test and the program evaluation by mail or by fax to the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) at:

Mail: P.O. Box 3006
Rockville, MD 20847

Fax (secure): 1-866-760-5947

If you have questions about this CE program, call the NICHD at 1-800-370-2943, or send an e-mail to NICHDInformationResourceCenter@mail.nih.gov.

PRE-TEST

This pre-test is designed to measure baseline knowledge about SIDS, risk-reduction recommendations for SIDS, and how to communicate the recommendations to parents and caregivers. Some questions may have more than one correct answer. The questions cover the major content areas of this CE program; however, the pre-test is not scored for CE credit.

Instructions: Please check the correct response and score your test using the answer key on page 33.

1. Which of the following statements about SIDS is true?
 - ☐ A. SIDS is the leading cause of death of infants between one month and one year of age.
 - ☐ B. SIDS is completely preventable.
 - ☐ C. Most infants seem sick before they die from SIDS.
 - ☐ D. SIDS is caused by immunizations.
2. Which of the following statements is not a SIDS risk-reduction recommendation?
 - ☐ A. Do not smoke around infants.
 - ☐ B. Place infants on their backs to sleep.
 - ☐ C. Do not use fluffy bedding or stuffed toys in the sleeping area.
 - ☐ D. Keep infants warm by wrapping tightly with blankets.
3. Among parents and caregivers, common reasons for not complying with the back sleeping recommendations include:
 - ☐ A. Fear of aspiration or choking
 - ☐ B. Relatives recommending the prone position
 - ☐ C. Concern about a flattened skull (plagiocephaly)
 - ☐ D. All of the above
4. Current SIDS research supports a theory that describes the convergence of factors that may lead to SIDS deaths. The theory is called:
 - ☐ A. Vulnerable infant model
 - ☐ B. Critical development theory
 - ☐ C. Triple-risk model
 - ☐ D. Double-risk theory
5. Since the release of the American Academy of Pediatrics Task Force on SIDS risk-reduction guidelines in 1992, the SIDS rate in the United States has decreased by:
 - ☐ A. 30%
 - ☐ B. 50%
 - ☐ C. 70%
 - ☐ D. 15%
6. SIDS rates remain disproportionately high in which of the following ethnic groups:
 - ☐ A. African Americans
 - ☐ B. American Indians/Alaska Natives
 - ☐ C. Hispanics
 - ☐ D. Both A and B
7. Which of the following constitutes a safe sleeping environment for an infant:
 - ☐ A. Soft sleeping surfaces
 - ☐ B. A firm mattress with stuffed toys surrounding the perimeter
 - ☐ C. Loose bedding, such as quilts and comforters
 - ☐ D. A firm mattress, free of loose bedding and stuffed toys
8. Research shows that parents are more likely to follow SIDS recommendations when they:
 - ☐ A. Receive specific advice from health care providers
 - ☐ B. Observe the nursing staff placing the baby on his or her back to sleep
 - ☐ C. Receive SIDS incidence statistics
 - ☐ D. Both A and B
9. When nurses speak to parents and caregivers about SIDS, it is important that their messages:
 - ☐ A. Be detailed
 - ☐ B. Include statistics
 - ☐ C. Be clear and simple
 - ☐ D. Include medical terminology
10. The appropriate time to deliver SIDS risk-reduction recommendations to parents is:
 - ☐ A. Within the first 24 hours after delivery
 - ☐ B. During pregnancy
 - ☐ C. At well-baby visits
 - ☐ D. All of the above

A close-up portrait of a smiling Black woman, likely a healthcare professional, wearing a stethoscope. The image is overlaid with a semi-transparent green filter. The text "Session 1" is written in a purple script font across the middle of the image.

Session 1

What You Need To Know About Sudden Infant Death Syndrome (SIDS)

“SIDS” is the term used to describe the sudden death of an infant younger than one year of age that remains unexplained after a complete investigation.¹ Over the past two decades, nurses, physicians, other health care providers, and caregivers have made significant progress in reducing the number of American infants who die each year of SIDS. This decrease was largely the result of the actions of health care providers and public health campaigns that have educated parents and caregivers about risk factors for SIDS.

As a result, the United States has seen a 50 percent decrease in the SIDS rate and a significant decline in the number of infants who are placed to sleep on their stomachs (prone position).

Despite this progress, SIDS remains the leading cause of death among U.S. infants between one month and one year of age.² Several studies show that the safe sleep message is not sufficiently reaching all segments of society.^{3,4} Reducing the SIDS rate requires knowledge and action by parents, caregivers, and all health care providers.

Nurses who care for newborns and infants play a critical role in this effort. The partners in *Back to Sleep*, a national campaign that seeks to educate caregivers about SIDS risk-reduction strategies, are working with national nursing associations to spread safe sleep messages to their members.

As a nurse, you are an important role model for parents and families. By consistently placing infants to sleep on their backs and using other safe sleep practices while infants are still in the hospital, you can help to model the risk-reduction recommendations. By disseminating information, you can also help to educate families about SIDS risk factors and to reinforce ways to reduce the risk of SIDS.

Lesson 1: Understanding SIDS

What Is SIDS?

SIDS is defined as:

*The sudden death of an infant younger than one year of age that remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the infant's and family's clinical histories.*⁵

Although associated with a sleep period, SIDS deaths are unpredictable. SIDS is often referred to as a “diagnosis of exclusion” because it is applied only after ruling out all probable alternatives, including suffocation, viruses, or other illnesses. A diagnosis of SIDS is made by collecting information and conducting forensic tests, and by talking with parents, other caregivers, and health care providers.⁶ In the absence of an identifiable cause of death after this process, infant fatalities may be diagnosed as SIDS.⁷

SIDS can affect infants up to one year of age, but most SIDS deaths occur by the end of the sixth month of age; the greatest number of SIDS deaths occur in infants between two and four months of age.⁸ SIDS is generally rare during the first month of life. However, recent data suggest a slight shift in the age of death over the last few years. In 2001, more infants died of SIDS during the first month of life and after six months of age than did so for the same age ranges in 1992.⁹

Because most cases of SIDS occur when a baby is sleeping in a crib, SIDS is also commonly known as “crib death.” However, the cribs themselves do not cause SIDS.

WHAT IS SIDS?

SIDS IS:

The leading cause of death in infants from one month to one year of age, with most deaths occurring between two and four months of age;

A sudden and silent medical disorder that can happen to a seemingly healthy infant;

A death often associated with sleep and with little or no signs of suffering;

Determined only after an autopsy, an examination of the death scene, and a review of the infant's and family's clinical histories that provide no other cause of death; and

A diagnosis of exclusion, in which the cause of death can be determined only after ruling out other causes.

SIDS IS NOT:

Entirely preventable, but the risk can be reduced;

The same as suffocation;

Caused by vomiting and/or choking;

Caused by the diphtheria, pertussis, and tetanus (DPT) vaccine or by other immunizations;

Contagious;

The result of child abuse or neglect; and/or

The cause of every unexpected infant death.

Source: National SIDS/Infant Death Resource Center. (2004). What is SIDS?

Current Research Findings and Theories About SIDS

Most scientists believe that babies who die of SIDS are born with one or more conditions that cause unexpected responses to the common internal and external stressors that occur during an infant's life. Many researchers argue that the clue to finding the cause(s) of SIDS lies in a deeper understanding of the development and functions of the brain and nervous system of infants, including those who succumb to SIDS.¹⁰

Brain Abnormalities

Mounting evidence suggests that some babies who succumb to SIDS are born with brain abnormalities. These abnormalities are typically within a network of neurons that use serotonin as a neurotransmitter and are located in a portion of the brain stem likely to control breathing, heart rate, blood pressure, temperature, and waking during sleep.¹¹

But scientists believe that brain abnormalities alone may not be sufficient to cause SIDS death. They theorize that other events must also occur, such as lack of oxygen, excessive carbon-dioxide intake, overheating, or an infection, for an infant to succumb to SIDS. (See the description of the “triple-risk model” on page 9 for further explanation.) For example, many babies experience a lack of oxygen and excessive carbon-dioxide levels when they have respiratory infections or when they re-breathe exhaled air that has become trapped in bedding as they sleep on their stomachs. Normally, infants sense this inadequate air intake, and their brains trigger them to wake up or trigger their heartbeats or breathing patterns to change or compensate. In a baby with a flawed brain stem, however, these protective mechanisms may be missing, so the child may succumb to SIDS. Such a scenario might explain why babies who sleep on their stomachs are more susceptible to SIDS.

Genetic Mutations and Polymorphisms

Even though it is unlikely that one defective gene predisposes a baby to SIDS, genes may act in combination with environmental risk factors to result in SIDS.¹² Predisposing factors may include mutations and/or polymorphisms in genes involved in metabolism and the immune system, as well as conditions that affect the brain stem and cause neurochemical imbalances in the brain. Mutations can give rise to genetic disorders that can cause death, while polymorphisms may predispose infants to death in critical situations.

One example of a genetic mutation that may be misdiagnosed as SIDS is a deficiency in fatty acid metabolism.¹³ Some babies who die suddenly may be born with a metabolic disorder that prevents them from properly processing fatty acids. A build-up of fatty acid metabolites can lead to a rapid disruption in breathing and heart function—a disruption that can be fatal. If there is a family history of a metabolic disorder, genetic screening can determine if one or both of the parents are carriers of the mutation and, if so, the baby can be tested soon after birth. If the condition is not identified, however, the resulting death may be mistaken for SIDS.

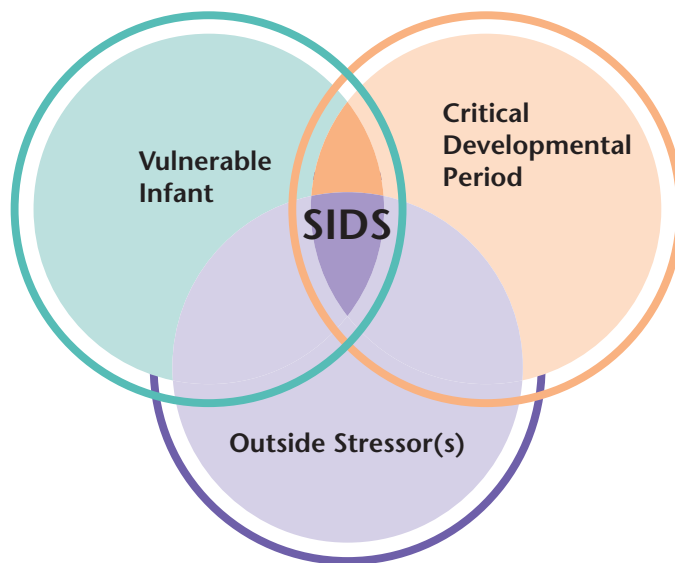
With sudden infant death, it is important to search for genetic mutations that are deadly; infants with such mutations should be excluded from those diagnosed as dying of SIDS.¹⁴ In the future, some infants, who would today be diagnosed as dying from SIDS, will probably be diagnosed as having metabolic or cardiac disease. With the current level of knowledge, however, using genetic markers and mutations in relation to SIDS requires caution. Because this area of research is new, a thorough postmortem investigation must be performed before a final diagnosis is made.

An example of a genetic polymorphism that may be associated with SIDS involves the immune system. Studies in Norway and Germany have revealed an association between partial deletions of the highly polymorphic *C4* gene and mild respiratory infections in infants who have died of SIDS.¹⁵ Differences in *C4* expression may contribute to differences in the strength of the immune system by regulating the predisposition to infectious and autoimmune diseases that put infants at higher risk of SIDS. Partial deletions of the *C4* gene are fairly common and are found in up to 20 percent of the white population. Also, many SIDS infants have an activated immune system, which may indicate that they are vulnerable to simple infections. In one study, approximately 50 percent of infants who died of SIDS had a mild upper-airway infection before death.¹⁶

The Triple-Risk Model

Researchers currently believe that the triple-risk model is a useful construct for understanding SIDS deaths. The triple-risk model describes the convergence of three conditions that may lead to the death of an infant (see Figure 1).

Figure 1. The Triple-Risk Model



- **Vulnerable Infant.** An underlying defect or brain abnormality makes the baby vulnerable. In the triple-risk model, certain factors, such as **defects** in the parts of the brain that control respiration or heart rate, or **genetic mutations**, confer vulnerability.
- **Critical Developmental Period.** During the infant's first six months of life, rapid growth phases and changes in homeostatic controls occur. These changes may be evident (e.g., **sleeping and waking patterns**), or they may be subtle (e.g., **variations in breathing, heart rate, blood pressure, and body temperature**). Some of these changes may temporarily or periodically destabilize the infant's internal systems.
- **Outside Stressor(s).** Most babies encounter and can survive environmental stressors, such as **second-hand tobacco smoke, overheating, a stomach sleep position, or an upper-respiratory infection**. However, an already-vulnerable infant may not be able to overcome them. Although these stressors are not believed to single-handedly cause infant death, they may tip the balance against a vulnerable infant's chances of survival.¹⁷

According to the triple-risk model, all three elements must be present for a sudden infant death to occur:

1. The baby's **vulnerability** is undetected;
2. The infant is in a **critical developmental period** that can temporarily destabilize his or her systems; and
3. The infant is exposed to one or more **outside stressors** that he or she cannot overcome because of the first two factors.

If caregivers can remove one or more outside stressors, such as placing an infant to sleep on his or her back instead of on the stomach, they can reduce the risk of SIDS.¹⁸

SIDS Occurrence and Risk-Reduction Outreach

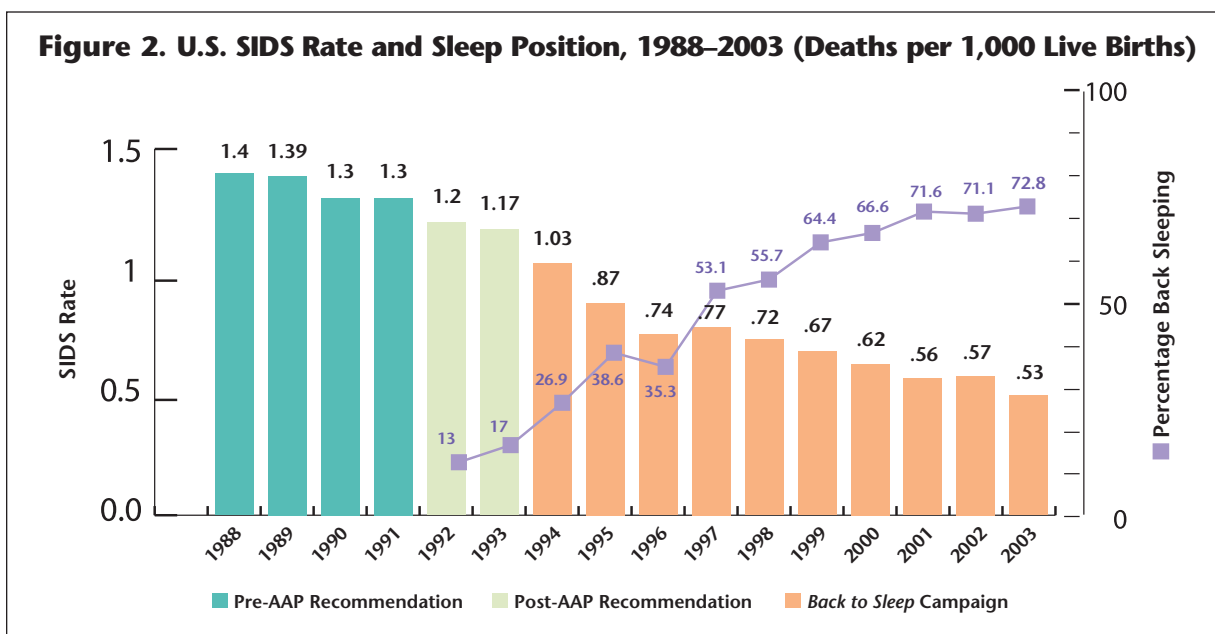
For every year between 1983 and 1992, the average number of reported SIDS deaths in the United States ranged from 5,000 to 6,000. In 1992, the American Academy of Pediatrics (AAP) Task Force on Infant Sleep Position and SIDS (now the AAP Task Force on SIDS, and hereafter the AAP Task Force) issued a recommendation that all healthy infants younger than one year of age be placed to sleep on their backs or sides to reduce the risk of SIDS. The AAP made this recommendation after numerous international research reports concluded that infants who slept on their stomachs had a significantly higher risk of dying from SIDS than infants who slept on their sides or backs.¹⁹

In 1994, the NICHD and a number of partners, including the AAP, the Maternal and Child Health Bureau of the Health Resources and Services Administration, the SIDS Alliance (now First Candle/SIDS Alliance), and the Association of SIDS and Infant Mortality Programs, launched the *Back to Sleep* campaign to raise awareness among parents and caregivers about ways to reduce the risk of SIDS. The primary recommendation for reducing the risk of SIDS was to place healthy infants to sleep on their backs. *Back to Sleep* and other awareness campaigns helped to spread safe sleep messages among parents, families, and caregivers, while the AAP helped to spread the message in the physician community.

Research in subsequent years provided additional evidence of the dangers posed to infants by stomach sleeping. The data were so compelling that, in 1996, the AAP Task Force recommended that infants be placed to sleep *wholly on their backs*, the position associated with the lowest SIDS risk. The AAP concluded that stomach sleeping conferred the highest risk of SIDS, the side-lying position fell in between, and “back was best” for reducing a baby’s risk of SIDS.²⁰

The most current data from the National Center for Health Statistics show that 2,162 infants younger than age one year died from SIDS in the United States in 2003,²¹ a decline of more than 50 percent since 1992. From 1992 to 2005, the frequency of stomach sleeping decreased from more than 70 percent to 13 percent of U.S. infants (see Figure 2).²² Many researchers, policy makers, and health care providers agree that declines in both SIDS and stomach sleeping rates have been assisted by public awareness campaigns, such as *Back to Sleep*.²³

Still, SIDS remains the leading cause of death among U.S. infants between one month and one year of age and is the third leading cause of death overall among U.S. infants younger than age one year.²⁴ Among certain minority groups, about one-third of infants are still placed to sleep on their stomachs,²⁵ a statistic that challenges the U.S. Healthy People 2010 goal of having fewer than 10 percent of all American families use the stomach sleep position for their infants.²⁶



Sources: SIDS rate source: National Center for Health Statistics, Centers for Disease Control and Prevention, Department of Health and Human Services.²⁷⁻²⁹ Sleep position data: Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Infant Sleep Position Study.³⁰⁻³¹

SIDS Occurrence in Communities of Color

SIDS rates have declined in all populations throughout the United States, yet disparities in SIDS risk factors and SIDS rates remain (see Table 1). African American infants are more than two times as likely to die of SIDS as white infants, and American Indian/Alaska Native infants are nearly three times as likely to die of SIDS as white infants.^{32, 33} Hispanic and Asian/Pacific Islander infants have among the lowest SIDS rates of any racial or ethnic group in the country.³⁴ Several agencies, including the NICHD, are intensifying efforts to reach high-risk populations with the latest risk-reduction information.

Table 1. SIDS Deaths by Race/Ethnic Origin of the Mother, 2003

Race	Number	Rate per 1,000 Live Births
All Races	2,162	0.53
American Indian/Alaska Native	54	1.25
African American	677	1.18
White	1,104	0.48
Hispanic	290	0.32
Asian/Pacific Islander	50	0.23

Source: Mathews, T.J., Menacker, F., & MacDorman, M.F. (2003). Infant mortality statistics from the 2001 period linked birth/infant death data set. *National Vital Statistics Reports*, 52(12).

To develop effective interventions for SIDS, it is important to understand how other factors, including distinct cultural issues, interact with basic biological factors.

The increased risk among some groups may be due to factors not yet understood as well as the result of practices that pre-date information about SIDS risk factors. For example, studies have shown that:

- Sleeping on soft bedding and bed sharing, two practices that increase SIDS risk, are more common among minority populations.³⁵
- Infants born to African American families and to families living in some urban areas are more likely to be placed to sleep on their stomachs, the position that confers the highest SIDS risk.³⁶
- Dressing an infant in multiple layers of clothing can lead to overheating, which is a leading SIDS risk factor in American Indian communities.³⁷

Lesson 2: Understanding SIDS Risk

Currently, there is no known way to completely prevent SIDS. There are several known risk factors for SIDS, although some infants who die of SIDS have no risk factors. Several risk factors present during the prenatal period, at birth, and throughout the infant's first year can be modified or controlled to reduce risk. The major modifiable factors that put infants at **higher risk of SIDS** are:³⁸

- Stomach sleeping during naps and at night;

- Soft sleeping surfaces and loose, fluffy bedding;

- Overheating during sleep;

- Maternal smoking during pregnancy and smoke in the infant's environment; and

- Bed sharing with an adult (especially when the adult has used alcohol or drugs or is fatigued) or with other children, regardless of age.

A Closer Look at Sleep Environment Dangers

In addition to placing babies on their backs to sleep for naps and at night, as discussed earlier, parents and caregivers also can reduce the risk of SIDS by guarding against several other sleep environment dangers.

Soft Sleeping Surfaces and Loose Bedding

Studies have found that sleeping on soft surfaces, such as couches and soft mattresses, is a significant SIDS risk factor.³⁹ For instance, in 2003, a NICHD-supported study showed that placing an infant to sleep on soft bedding as opposed to on firm bedding appeared to pose five times the risk of SIDS. More striking, though, was the fact that infants who slept on their stomachs on soft bedding were at *19 times greater risk* of SIDS than were infants who slept on their backs on firm bedding. Researchers do not know why sleeping on such surfaces would increase the risk of SIDS, but they warn that the practice appears to be highly dangerous.⁴⁰ The U.S. Consumer Product Safety Commission, the AAP, and the NICHD jointly recommend that babies sleep on their backs on a safety-approved* mattress, free of loose materials, including pillow-like stuffed toys and bumper pads.⁴¹

Overheating During Sleep

Babies should be kept warm during sleep, but not too warm. Studies show that an overheated baby is more likely to go into a deep sleep from which it is difficult to arouse.^{42–46} Some evidence indicates that increased SIDS risk is associated with excessive clothing or blankets and a higher temperature in the room. SIDS risk is higher for infants who sleep on a soft surface and/or with their heads covered than for infants who sleep on a firm surface and/or without their heads covered. The increased retention of body heat—through excessive insulation from bedding and clothing—can be dangerous for some infants and may contribute to

* U.S. Consumer Product Safety Commission *Crib Safety Tips*: <http://www.cpsc.gov/cpscpub/pubs/cribsafe.html>

SIDS.^{47–51} Increased SIDS risk has also been associated with the season of the year. In the past, SIDS deaths have been more common during cold weather—possibly because infants are more likely to be overdressed or placed under heavier blankets, which may cause them to overheat—but statistics indicate that this association appears to be waning.⁵² Studies have also found that overheating may increase the risk of SIDS for a baby who has a cold or infection. Parents and caregivers are advised not to overdress the baby and to keep the thermostat at a comfortable temperature. In general, if the room temperature is comfortable for an adult, then it is appropriate for a baby.⁵³

Smoking During Pregnancy and Smoke in the Infant's Environment

Infants whose mothers smoke during or after pregnancy are at greater risk of SIDS.⁵⁴ Infants born to mothers who smoked during pregnancy are three times more likely to die of SIDS. Exposure to passive smoke in the household also doubles a baby's SIDS risk.^{55, 56} Exactly how smoking during pregnancy affects the infant is not clear, but smoking may negatively affect development of the nervous system. Studies of the mechanisms underlying the association between smoking and SIDS have found that during the last half of pregnancy changes occur in nicotine-binding sites on the baby's brain stem, specifically in areas involved with arousal, heart and breathing functions, sleep, and body movement control.⁵⁷ Infants who die from SIDS have a higher nicotine concentration in their lung tissue compared with infants who did not die from SIDS.⁵⁸ This finding supports the statement that postnatal environmental tobacco smoke exposure is important in SIDS risk.^{59, 60} However, the mechanism for the association between secondhand smoke and SIDS is unknown.

Bed Sharing

Bed sharing among infants and family members, particularly among adults and infants, is common in many cultures.⁶¹ Many mothers share a bed with their infants because it makes breastfeeding easier and enhances bonding. Even though some believe that bed sharing may reduce the risk of SIDS because the parent is nearby to monitor the baby, studies do not support bed sharing as protective strategy for SIDS.⁶²

On the contrary, evidence is growing that bed sharing is hazardous. In some situations, bed sharing can compound the risk posed by other factors. For example, bed sharing is shown to increase SIDS risk when:

- The mother smokes, has recently consumed alcohol, or is fatigued;
- The infant is covered by a blanket or quilt; or
- There are multiple bed-sharers.^{63–70}

Research has shown that the presence of other children in the bed increases the risk of SIDS more than five-fold.⁷¹ Bed sharing with young infants—even when mothers do not smoke—is also a risk factor for SIDS.^{72–74}

The safest alternative to bed sharing may be *room sharing*, a situation in which the infant shares a room with the parents, but has his or her own crib or bassinet.^{75–78} Keeping the baby's sleep area close to, but separate from, where the parents sleep is recommended. Parents who wish to room share should place the infant's crib near the mother for easy breastfeeding and should return the infant to his or her crib after breastfeeding. Families should also follow all other SIDS risk-reduction recommendations.

STOMACH SLEEPING

A Note on the Danger of Unaccustomed Stomach Sleeping

NICHHD-supported research found that infants who are accustomed to sleeping on their backs but who are then placed to sleep on their stomachs or sides are at an increased risk of SIDS—greater than the increased SIDS risk experienced by infants who are always placed on their stomachs or sides.⁷⁹ In addition, a 1999 study found that if an infant who was usually placed to sleep on his or her back was then placed to sleep on his or her stomach or side, his or her SIDS risk was seven to eight times greater than that of an infant always placed to sleep on his or her stomach or side.⁸⁰



Unaccustomed Stomach Sleeping in Child Care Settings

The danger of the unaccustomed stomach sleep position is particularly evident in child care settings. In the United States, approximately 20 percent of SIDS deaths occur while the infant is in the care of a child care provider.⁸¹ This finding is significant, given that two-thirds of infants younger than 12 months of age are in non-parental child care at least some of the time.⁸² Despite the 50 percent decline in SIDS since 1992, the proportion of SIDS deaths that occurred in child care settings has remained constant.⁸³ Many of these child care deaths are associated with the stomach sleep position, especially when the infant is unaccustomed to being placed in that position.

Despite *Back to Sleep* and other awareness campaigns, many child care providers continue to place infants to sleep on their stomachs. A 1997 study revealed that 43 percent of licensed child care center workers were unaware of the association between SIDS and infant sleep position.⁸⁴ Subsequent surveys documented that despite increased awareness approximately 25 percent of workers at child care centers still placed infants to sleep on their stomachs.⁸⁵ The primary reason for placing infants to sleep on their stomachs was that child care workers were either unaware of the dangers and/or were misinformed.⁸⁶ Although providers are more likely to use the back sleep position when centers have written sleep policies, licensed child care centers seldom have such policies.⁸⁷ Studies have found that educational programs for child care providers are effective in increasing knowledge of safe sleep positions and in promoting the development of written sleep position policies.⁸⁸

Based on the evidence, then, consistency in sleeping position is extremely important: Parents, grandparents, babysitters, child care providers, and everyone else in charge of putting a baby to sleep should place the baby on his or her back to sleep every time, for naps and at night.

Lesson 3: Reducing SIDS Risk

Why Back to Sleep?

The single most effective action that parents and caregivers can take to lower their baby's risk of SIDS is to place their baby to sleep on his or her back for naps and at night. Stomach sleeping carries between 1.7 and 12.9 times the risk of SIDS as back sleeping.⁸⁹ The mechanisms by which stomach sleeping might lead to SIDS are not entirely known. Studies suggest that stomach sleeping may increase SIDS risk through a variety of mechanisms, including:

- Increasing the probability that the baby re-breathes his or her own expired breath, leading to carbon dioxide build-up and low oxygen levels;
- Causing upper-airway obstruction; and
- Interfering with body heat dissipation, leading to overheating.⁹⁰

Whatever the mechanism, evidence from numerous countries, including New Zealand, Sweden, and the United States, suggests that placing babies on their backs to sleep results in a substantial decline in the SIDS rate, compared to placing babies on their stomachs to sleep. Researchers have established the link between stomach sleeping and SIDS by observing dramatic decreases in SIDS rates in countries where public health campaigns to reduce the prevalence of stomach sleeping have been successful. In areas where stomach sleeping is rare (including Hong Kong), SIDS rates historically have been very low, which further strengthens the association.^{91, 92}

Furthermore, compared with infants who sleep on their backs, infants who sleep on their stomachs:

- Are less reactive to noise;
- Experience sudden decreases in blood pressure and heart rate control; and
- Experience less movement, higher arousal thresholds, and longer periods of deep sleep.^{93, 94}

All of these characteristics put an infant at higher risk of SIDS. The simple act of placing infants on their backs to sleep significantly lowers SIDS risk.

In addition, placing babies on their backs to sleep is not associated with risks for other problems. For instance, there is no increase in aspiration or complaints of vomiting when babies are placed on their backs to sleep.⁹⁵ And, although researchers have found that back sleepers are somewhat slower to learn to roll from their stomachs to their backs, sit up, creep, crawl, and pull to the standing position than stomach sleepers, there is no significant difference in the age when infants learn to walk.⁹⁶

Moreover, babies may benefit in other ways from sleeping on their backs. A 2003 study found that infants who slept on their backs were less likely than infants who slept on their stomachs to develop ear infections, stuffy noses, or fevers.⁹⁷ Research on this association is ongoing.

Back to Sleep: Advice for Health Care Providers

The AAP Task Force recommends that personnel who work in hospital nurseries place babies on their backs to sleep.^{98, 99} If there are concerns about possible choking during the immediate neonatal period (defined as the first few hours following birth), hospital personnel may place the babies on their sides, propped up against the side of the bassinet for stability. But within several hours of birth, babies should be placed wholly on their backs to sleep. The back sleeping position is recommended for preterm^{163, 164} and term infants.

As stomach sleeping has declined in response to back sleeping campaigns worldwide, statistics show that the contribution of side sleeping to SIDS risk has increased. Research shows that side sleeping is not as safe as back sleeping and therefore is not advised.¹⁰⁰

The Importance of Tummy Time for Healthy Infant Development

The NICHD and other organizations remind parents not to go overboard with placing their baby on his or her back. It is important to allow babies, when awake and playing, ample Tummy Time as a necessary part of their development.^{101, 102} Parents and caregivers should place infants on their stomachs for a certain amount of time each day, when they are awake and when they are supervised, to promote motor development. Lying on the stomach during playtime strengthens muscles in the shoulders and neck that are used to acquire many infant motor milestones.



Tummy Time can also help to prevent the development of flat spots on babies' heads. There is no evidence to suggest that this flattening is harmful to infants or that it is associated with any permanent effects on head shape.¹⁰³ However, parents and caregivers may wish to alternate the baby's head position when he or she is placed to sleep so that the baby is not always sleeping on the same side of the head. Parents and caregivers can also periodically move the crib around the room so the baby has to turn his or her head in different directions to see what's going on. Another important part of preventing the development of flat spots on babies' heads is holding the baby upright when he or she is not sleeping and limiting the amount of time the baby spends in car seats, swings, carriers, or bouncy seats.^{104, 105}

Factors Thought To Protect Against SIDS

Several studies have examined environmental influences and child-rearing practices that may help to protect an infant from SIDS. One such practice is **breastfeeding**. Physiologic studies show that breastfed infants are more easily aroused than their formula-fed counterparts during sleep,^{106, 107} which might explain the protective effect of breastfeeding against SIDS. However, epidemiologic studies are inconsistent, with some finding a protective effect and others failing to find such an effect.^{108–113} It may be that not smoking and other factors associated with breastfeeding, rather than breastfeeding itself, are protective. Current evidence is insufficient to recommend breastfeeding as a strategy to reduce the risk of SIDS.¹¹⁴

Several studies have found that infants who used **pacifiers** during their last sleep were at significantly lower risk of SIDS compared with infants who did not use pacifiers,¹¹⁵ and a recent meta-analysis reinforced findings of the protective effect of pacifiers against SIDS.¹¹⁶ As with breastfeeding, the mechanism for this association is unclear, but lowered sleep arousal thresholds are one possibility.¹¹⁷

It is important to point out to caregivers that environmental influences such as these, in and of themselves, are not reliable in predicting how, when, why, or if SIDS will occur.

Session 1: Take-Away Messages



- Despite significant declines in SIDS rates, SIDS still remains the leading cause of postneonatal death among U.S. infants. Greater efforts must be made to communicate and encourage safe sleep practices among all parents and caregivers.
- Research indicates that some infants may be predisposed to SIDS because of a brain abnormality or genetic defect and because they are in a critical developmental period; however, it likely takes exposure to an outside stressor, such as stomach sleeping, loose bedding, or tobacco smoke, to trigger sudden death.
- American Indian/Alaska Native infants have the highest SIDS rate of any racial or ethnic group in the United States.
- The single most effective action that parents and caregivers can take to reduce the risk of SIDS is to place infants on their backs to sleep for naps and at night.
- The AAP Task Force and partners in the *Back to Sleep* campaign encourage parents and caregivers to follow a list of safe sleep recommendations to reduce the risk of SIDS. A complete list of these recommendations can be found on page 18.

SIDS Risk-Reduction Recommendations

- **Always place the baby on his or her back to sleep for naps and at night.** The back sleep position is the safest, and every sleep time counts.
- **Place the baby to sleep on a firm sleep surface, such as on a safety-approved* crib mattress, covered by a fitted sheet.** Never place the baby to sleep on pillows, quilts, sheepskins, or other soft surfaces.
- **Keep soft objects, toys, and loose bedding out of the baby's sleep area.** Don't use pillows, blankets, quilts, sheepskins, or pillow-like crib bumpers in the baby's sleep area, and keep all items away from the baby's face. If you choose to use a blanket, place the baby with his or her feet at the end of the crib. The blanket should reach no higher than the baby's chest. Tuck the ends of the blanket under the crib mattress to ensure safety.
- **Do not allow smoking around the baby.** Don't smoke before or after the birth of the baby, and don't let others smoke around the baby.
- **Keep the baby's sleep area close to but separate from where you and others sleep.** The baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you. If you bring the baby into bed with you to breastfeed, put him or her back in a separate sleep area, such as a bassinet, crib, cradle, or a bedside co-sleeper (an infant bed that attaches to an adult bed) when finished.
- **Think about using a clean, dry pacifier when placing the baby down to sleep,** but don't force the baby to take it. If breastfeeding, wait until the baby is one month of age or is used to breastfeeding before using a pacifier.
- **Do not let the baby overheat during sleep.** Dress the baby in light sleep clothing and keep the room at a temperature that is comfortable for an adult.
- **Avoid products that claim to reduce the risk of SIDS** because most have not been tested for effectiveness or safety.
- **Do not use home monitors to reduce the risk of SIDS.** If you have questions about using monitors for other conditions, talk to your health care provider.
- **Reduce the chance that flat spots will develop on the baby's head.** Provide Tummy Time when the baby is awake and someone is watching; hold the baby upright when he or she is not sleeping; change the direction that the baby lies in the crib from one week to the next; and avoid too much time in car seats, carriers, and bouncy seats.



Talk about SIDS risk to child care providers, grandparents, babysitters, and everyone who cares for the baby. As more research is conducted on infant sleep position and SIDS, the partners in the *Back to Sleep* campaign will continue to modify their recommendations so that the most scientifically sound information is communicated to families and caregivers.

* U.S. Consumer Product Safety Commission *Crib Safety Tips*: <http://www.cpsc.gov/cpscpub/pubs/cribsafe.html>
Sources: Eunice Kennedy Shriver National Institute of Child Health and Human Development. (2005). *Safe Sleep for Your Baby: Reduce the Risk of Sudden Infant Death Syndrome (SIDS)*. NIH Pub No. 05-7040; and Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116, 1245–1255.

A close-up photograph of a woman with light brown hair pulled back, smiling gently at the camera. She is wearing a light-colored collared shirt. The image is overlaid with a semi-transparent teal color. In the blurred background, a man with dark hair is visible. The bottom half of the image transitions into a solid orange color.

Session 2

How To Communicate SIDS Risk-Reduction Techniques to Parents and Caregivers

Nurses are in a unique position to educate parents and caregivers about SIDS and to help them learn and follow SIDS risk-reduction measures. Because nurses counsel parents during the prenatal period, during labor and delivery, in the immediate postpartum period, and after the baby goes home, they are often among a family's most trusted advisors on how to properly care for newborns.

Nurses have the power to influence parents' behavior by modeling safe sleep practices while the infant is in the hospital, and by following up with parents and caregivers to encourage compliance after the family goes home. By demonstrating safe sleep practices themselves, nurses can help families learn how to reduce the risk of SIDS.

As described in Session 1, the SIDS rate and the prevalence of stomach sleeping have declined dramatically in the United States over the last two decades. However, 13 percent of parents and caregivers still place their babies to sleep on their stomachs,¹¹⁸ despite the higher SIDS risk. Health care providers, child care providers, and others need to make a greater effort to encourage back sleeping in all communities and to eliminate the use of soft bedding, pre- and postnatal exposure to cigarette smoke, and other factors that put a baby at risk of SIDS.

Now that you know more about SIDS, its possible mechanisms, and its risk factors, consider the impact that nurses like you can have on parental behavior in reducing SIDS risk. This session explains some of the ways that you can teach parents and caregivers how to reduce a baby's risk of SIDS, and how to best communicate safe sleep messages.

Lesson 1: Nurses as Role Models for Parents

Nurses are in a powerful position to help correct misconceptions and to counter myths about SIDS. Nurses are also in a unique position because, more than other health care providers, they can model SIDS risk-reduction techniques to ensure that families know how to reduce the risk. The most critical period for nurses to influence parents' behaviors is the 24 to 48 hours following delivery.¹¹⁹

People learn best through observation,¹²⁰ and research shows that parents are more likely to follow safe sleep practices—particularly placing infants in the back sleep position—when they see nursery staff consistently model this behavior in the hospital.¹²¹ A 2002 study in New Haven, Connecticut, found that nurses who placed infants in the back sleep position during the postpartum hospital stay changed parents' behaviors significantly.¹²² Modeling safe sleep position behavior can also be applied during postpartum care in out-of-hospital birth settings, such as a birthing center.

So, as a first step toward reducing the risk of SIDS, nurses and other staff can set a strong example by ensuring that infants in their care are always placed on the back to sleep. In doing so, they set an example for parents to follow throughout the baby's first year.

Knowing the Safe Sleep Message


Many surveys and studies show that the vast majority of nurses are knowledgeable about safe sleep recommendations. In a 1999 study, 97 percent of nurses surveyed reported awareness of the AAP recommendation that infants should be placed on their backs to sleep. Awareness did not always indicate compliance, however; only 67 percent of the nurses followed the recommendation. The majority of the nurses who did not comply cited “experience” or “the potential adverse consequences of the back position” as their reason for disregarding the recommendation.¹²³

Similarly, in a 2004 survey conducted in Missouri, 96 percent of nurses said they were aware of the AAP recommendation, but only 75 percent reported using either the side position or a mixture of side and back positioning. Most of those who said they were familiar with the AAP recommendation referred to the Academy's initial 1992 recommendation, so they thought that the side position was also acceptable.¹²⁴ These nurses were not aware of the 1996 recommendation that babies be placed *wholly on their backs*.

Spreading and Practicing the Safe Sleep Message

Studies have found that nursery staff do not uniformly recommend the back sleep position to families.^{125, 126} In a study conducted in California, only 34 percent of nursery staff surveyed stated that they consistently encouraged mothers to use the back sleep position.¹²⁷ Another study found that nurses with fewer years of experience were more likely to encourage parents to use the back-only position, while nurses with more years of experience did not recommend or use the back-only position. Primarily, these nurses indicated that they believed an infant does not sleep well on his or her back, but, as you learned in Session 1, *deep sleep and the inability to rouse from such sleep are possible contributors to SIDS*.¹²⁸

Even though the vast majority of nurses know the importance of back-only sleeping and many embrace it as positive advice for parents, not all nurses practice it.



In 2002, researchers in New Haven, Connecticut, hypothesized that training nurses about the safe sleep recommendations could change nursery practice and, ultimately, encourage more parents to place infants on their backs to sleep. In the study, nursery staff went through a 30-minute training session that emphasized the importance of educating parents about back sleeping and of modeling this behavior in the nursery. After the training, 81 percent of parents reported that a nurse told them to place their baby to sleep on his or her back, compared with 41 percent before the training. And 88 percent of parents reported *seeing* nurses place babies on their backs in the nursery, compared with only 37 percent of parents who witnessed this behavior prior to the training.¹²⁹

The study also found that after nursery practice was changed by the training, 75 percent of parents usually placed their infants on their backs to sleep at home, compared with 42 percent before the training.¹³⁰ This study demonstrates the impact nurses can have on the parents they encounter and the power of educating a clinic's or hospital's nursing staff about these topics.

The National Infant Sleep Position Study, supported by the NICHD from 1993 to 2000, found that recommendations from health care providers can greatly influence parents' choice of infant sleep position. The importance of all health care providers both spreading and practicing the safe sleep recommendations cannot be overstated. Nurses should be aware of the strong influence nurses have on parents and how parents care for their infants, and nurses should use this influence to help reduce the risk of SIDS.

Lesson 2: Challenges to SIDS Risk Reduction

Despite the best efforts of nurses and other health care providers, cultural practices and other issues can affect compliance with SIDS risk-reduction recommendations.

Cultural Challenges

SIDS rates vary across racial and ethnic groups in the United States, and infant care often has its roots in tradition and experience, more so than in science. Despite the dramatic decrease in SIDS rates in the general U.S. population, not all infants have benefited equally from this progress. In fact, high SIDS rates persist in many communities of color.

It is important that advice on SIDS risk reduction be as clear and as culturally appropriate as possible. When educating parents about SIDS risk reduction, consider cultural practices that may exist in the parents' community—for instance, the prevalence of stomach sleeping is much greater among some minority populations. One recent study in California found that African American mothers were twice as likely to put infants to sleep on their stomachs or sides as were white mothers.¹³¹ In fact, more than 15 percent of African American infants are placed on their stomachs to sleep;¹³² therefore, when discussing SIDS with African American families, stressing back sleeping may be the most important and culturally appropriate message.

Among American Indians and Alaska Natives, overheating and bed sharing are bigger issues in the context of SIDS risk than is back sleeping. For example, these infants are more likely to be dressed in two or more layers of clothing. Therefore, discussions of SIDS risk reduction with this audience should focus on not letting the child get too warm during sleep. Infants in an NICHD-funded study, the Aberdeen Area Infant Mortality Study, were more likely to die of SIDS if they wore two or more layers of clothing while they slept.¹³³

Many major risk factors for SIDS are also more common among minority and underserved populations. Nurses and other health care providers may need to address these issues directly or indirectly when discussing SIDS risk reduction with families.

- In American Indian communities, the Aberdeen Area Infant Mortality Study (2002) found that infants were less likely to die of SIDS if their mothers received visits from public health nurses before and after giving birth. The study also found that a mother's binge drinking (defined as five or more drinks at a time) during the first trimester of pregnancy made it eight times more likely that her infant would die of SIDS.
- Bed sharing between infants and family members is growing across all populations in the United States.¹³⁴ The National Infant Sleep Position Study found strong cultural influences on this practice. African American infants were five times more likely to share a bed with an adult or another child than were white infants.¹³⁵

Other Challenges

Safe sleep recommendations seem straightforward, and most—such as placing infants on their backs to sleep and clearing the crib of fluffy or loose bedding and stuffed animals—require little effort. Even so, nurses may encounter resistance from parents and families when discussing even the most straightforward SIDS risk-reduction actions. Some parents may hesitate to comply for other reasons, including:

- **The possibility of aspiration or choking.** A major reason parents avoid the back sleep position is that they fear their infant will regurgitate and aspirate if the infant sleeps on his or her back.

- **The infant's comfort.** Some parents report that their infants seem to sleep more deeply and appear more comfortable while sleeping on his or her stomach. In one study, the mothers' perception that their babies slept better on their sides or stomachs was 11 times more influential than were reading materials that recommended back sleeping.¹³⁶

- **Concern about a flattened skull.** Some infants develop a flattened appearance at the back of their skulls as a result of repeated back sleeping.

- **Recommendations by others.** Many parents say they use the stomach sleep position because a relative, caregiver, or health care provider recommended it, or because they saw one of these people placing an infant to sleep on his or her stomach in the hospital, at home, or during a medical visit. In one study, advice from the mother's own mother, sister, aunt, or grandmother was seven times more influential than were reading materials that recommended back sleeping.¹³⁷

The Chicago Infant Mortality Study (2002) reported that more than 94 percent of the mothers in the study stated that they had followed the medical advice they received regarding infant sleep position. Yet, for those mothers who did not receive medical advice or who did not follow it, past experience was the most important factor in determining sleep position.¹³⁸

You'll learn more about these concerns and ways to counter them later in this session.

Lesson 3: Communicating About SIDS Risk Reduction

Health literature is filled with studies that demonstrate the need for effective communications between health care providers and their patients.¹³⁹ As nurses know, providing information to patients often requires translating medical terminology into lay language so that patients can understand it. As mentioned earlier, the most effective way for nurses and health care providers to communicate risk-reduction messages is to practice them so that parents and families can see the messages in action. For a discussion of SIDS risk-reduction messages to be effective, nurses should try to assess the needs and abilities of the families they are working with and modify their communications accordingly.

In this lesson, you will learn how to assess the needs and abilities of families, so that you can adjust your messages appropriately without placing an unnecessary burden on your current workload.

Keep in mind that, in some cases, health education materials, such as brochures, pamphlets, and guidebooks, are written at a level far above the average adult's reading ability and may not be appropriate for many adults.¹⁴⁰ Messages about SIDS risk reduction, even those delivered orally, must be as clear and simple as possible.

Remember, too, that the simplest delivery technique is often the most effective. In a study involving mostly African American parents, those who were told to place their infants on their backs to sleep were most likely to place babies in the back sleep position. For the same study population, receiving written information did not affect sleep position at all.¹⁴¹

The following sections provide sample talking points to use with parents and caregivers to encourage safe infant sleeping practices.

Countering Common Arguments Against Back Sleeping

You can counter common arguments against back sleeping with accurate, science-based statements. Because parents may have concerns about back sleeping, it is important to address these issues directly. Opportunities to counter back sleeping challenges occur before and after delivery—during well-baby visits, postpartum home visits, and follow-up telephone calls. The following findings from SIDS risk-reduction research should help to allay some of the most commonly voiced concerns.

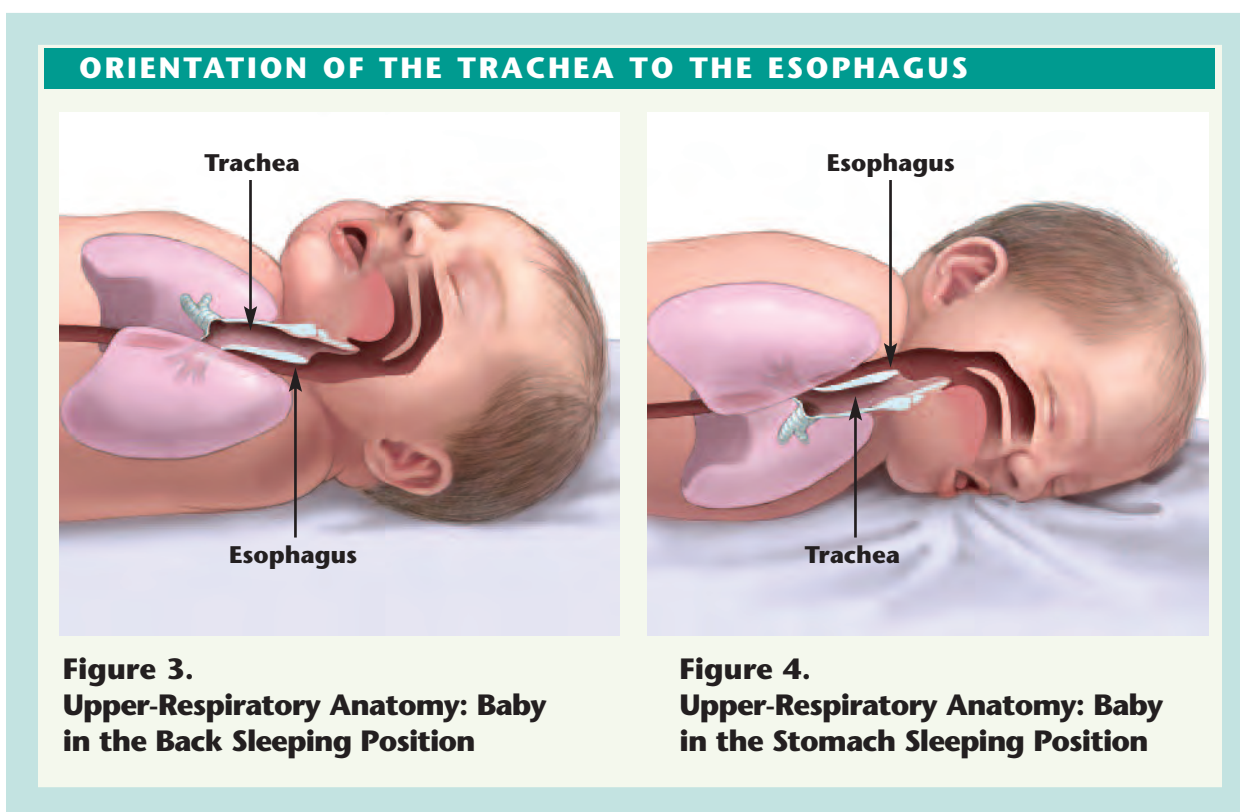
Fear of Aspiration

Aspiration is defined as the entry of secretions or foreign material into the trachea and lungs. Many parents and some nurses may fear that infants placed to sleep on their backs (supine) are more likely to experience complications from gastroesophageal reflux, including aspiration, than infants placed to sleep on their stomachs (prone). There is no evidence, however, that aspiration is more common among healthy babies sleeping on their backs than among healthy babies sleeping on their stomachs.^{142, 143}

Cases of fatal aspiration are very rare, except when associated with an underlying or associated medical condition. In most of the few reported cases of death due to aspiration, the infant's position at death, when known, was prone.

Indirect reassurance of the safety of the back sleeping position for infants comes from the knowledge that this position has been standard in China, India, and other Asian countries for many years. In England, Australia, and New Zealand, where there has been a major change in infant sleeping position from predominantly stomach sleeping to predominantly back sleeping, there is no evidence of any increased number of serious or fatal episodes of aspiration of gastric contents.

In fact, babies may actually clear secretions better when placed on their backs. Figures 3 and 4 show the orientation of the trachea to the esophagus in the back sleeping (Figure 3) and stomach sleeping (Figure 4) positions. When a baby is in the back sleeping position, the trachea lies on top of the esophagus. Anything regurgitated or refluxed from the esophagus must work against gravity to be aspirated into the trachea. Conversely, when a baby is in the stomach sleeping position, anything regurgitated or refluxed will pool at the opening of the trachea, making it easier for the baby to aspirate.



Comfort of the Infant

It is true that some infants who lie on their backs do not sleep as deeply as those who lie on their stomachs. Similarly, infants who are placed on their backs may be fussy or cry. However, the absence of very deep sleep is believed to help protect infants against SIDS.^{144, 145} As described in Session 1, babies who are placed on their stomachs sleep more deeply, are less reactive to noise, experience less movement, and are less able to be aroused than back sleeping infants.¹⁴⁶ *It is theorized that these factors may place an infant at higher risk for SIDS.* So, even though comfort is important, the infant's safety is more important; the back sleep position should be used even if the infant seems to sleep less comfortably.

Some products (e.g., wedge) claim to be designed to keep a baby in one position and to reduce the risk of SIDS. These products and others have not been tested for safety or effectiveness. These items are not recommended unless prescribed by a physician.

Flattened Skull

As you know, an infant's skull comprises free-floating bones that grow apart and together over the course of infancy to accommodate the growth and development of the brain. The appearance of persistent flat spots on an infant's head is known as *plagiocephaly*. In some cases, repeated external pressure on one area of the

head, such as that resulting from spending all of the time in one position, can lead to flattening of the back of the head; this situation is called *positional plagiocephaly*, and it is a real condition. Some data suggest that the number of babies with positional plagiocephaly has risen with the increased use of back sleeping.^{147, 148}

In most cases, though, the flat spots usually disappear in the months after the baby learns to sit up.¹⁴⁹ Once repeated pressure to the back of the head is eliminated, so too are the flat spots.

The most effective way to combat flat spots is to allow daily Tummy Time, placing the infant on his or her stomach while he or she is awake and supervised. Tummy Time helps to remove pressure on the back of the head and strengthens neck and shoulder muscle development, which helps the child prepare to sit up on his or her own.

In addition to Tummy Time, caregivers should also change the infant's head position in the crib—placing the head to one side for a week or so, and then placing it to the other side—while the infant sleeps on his or her back.¹⁵⁰ Changing an infant's head position helps to alleviate the pressure on the back of the skull. Caregivers also may wish to periodically move the crib around the room so the baby has to turn his or her head in different directions to see what's going on. Parents and caregivers should also hold the baby upright when he or she is not sleeping and limit the amount of time the baby spends in car seats, swings, carriers, or bouncy seats.¹⁵¹ All of these actions help to reduce the chances that flat spots will occur.

Some products (e.g., helmets or bands) claim to be designed to eliminate flat spots. These products have not been tested for safety or effectiveness. They are not recommended unless prescribed by a physician.

Plagiocephaly that is not related to head position can also occur. Such occurrences require intervention from a health care provider.

Advice From Others

One of the strongest reasons caregivers reported for choosing the stomach sleep position is that someone recommended it or said it was the way their family had always done it. A recent study of African American families determined that the likelihood of an infant being placed on his or her stomach to sleep nearly doubled if a grandmother lived in the home,¹⁵² suggesting that her practice and/or advice is a strong motivator to parents. As mentioned, however, sleep position advice from health care providers also carries a great deal of weight with families.

Parents need to be prepared to give solid reasons for their choice of the back sleep position in order to counter the contrary advice they may receive from others. They should also be prepared to insist on consistent use of the back sleep position even when others care for the infant.

MAKE TIME FOR TUMMY TIME

Nurses should encourage parents and caregivers to place babies on their stomachs while they are awake and are being supervised. Developmental experts advise that placing an infant on his or her stomach while awake and supervised is important for shoulder, arm, and neck development. A certain amount of Tummy Time is good for an infant when he or she is playing. In fact, Tummy Time is a very important and necessary part of an infant's healthy physical and brain development.

Source: Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116, 1245–1255.



Responding to Questions About SIDS and Sleep Position

Below are questions you may hear from parents and caregivers about back sleeping, along with ways in which you might respond.

Q. Why should I place my baby on his or her back to sleep?

A. Because it is the safest sleep position for babies. Babies are much less likely to die from SIDS if they sleep on their backs for naps and at night. Infants who are placed to sleep on their backs are also less likely to develop fevers, get stuffy noses, or develop otitis media (ear infection). Moreover, babies can benefit from sleeping on their backs because they can move their arms and legs and look around more easily.

Q. What's wrong with my baby sleeping on his or her stomach? I was placed to sleep on my stomach. Was that wrong?

A. Most of us were placed to sleep on our stomachs—and we survived. But many infants didn't. We have no way of knowing which babies will die of SIDS, but we do know how to reduce the risk. One of the most effective and easiest ways to reduce SIDS risk is to place infants on their backs to sleep. In the 1990s, more than 5,000 babies in the United States died of SIDS every year. Today, as stomach sleeping has decreased and back sleeping has increased, fewer than half that many babies—less than 2,500—die of SIDS each year. These statistics reinforce the evidence that it is safer to place babies on their backs to sleep.

Q. Won't my baby choke if he or she throws up while sleeping on his or her back?

A. Babies automatically swallow or cough up such fluid if they throw up. It's a reflex to make sure the airway is always open. Research has found no increase in choking or other problems in babies who sleep on their backs. *In fact, babies may actually clear secretions better when placed on their backs.* When a baby is in the back sleeping position, the trachea lies on top of the esophagus. Anything regurgitated or refluxed from the esophagus must work against gravity to be aspirated into the trachea. Conversely, when a baby is in the stomach sleeping position, anything regurgitated or refluxed will pool at the opening of the trachea, making it easier for the baby to aspirate.

Q. What if my baby's grandparents or caregivers want to place my baby to sleep on his or her stomach at naptime?

A. Make sure everyone knows to place your baby on his or her back to sleep for naps and at night. It is important that everyone use the same position because babies who are used to sleeping on their backs are at seven to eight times greater risk for SIDS if they are then placed on their stomachs to sleep.

Q. What if my baby can't adjust to sleeping on his or her back?

A. Deep sleep and the inability to rouse from such sleep are believed to contribute to SIDS. Even though comfort is important, the infant's safety is more important; the back sleep position should be used even if the infant seems to sleep less comfortably. It may seem that some babies don't like sleeping on their backs at first, but most adapt to it quickly. The earlier you start placing your baby on his or her back to sleep, the more quickly he or she will get used to that position.

Q. Is it okay if my baby sleeps on his or her side?

A. The side sleeping position is not as safe as the back sleeping position. For this reason, side sleeping is not advised.

Q. What about products designed to keep my baby in a certain position during sleep?

A. These products have not been tested for safety and are therefore not recommended. There is no proof that these products help lower a baby's risk of SIDS. Besides, during the time of greatest risk, two to four months of age, most babies are not able to turn over from their backs to their stomachs. So, a product claiming to prevent turning over would not be useful.

Q. Are there times when my baby should be on his or her stomach?

A. Yes, your baby should have plenty of Tummy Time—being on his or her stomach while he or she is awake and being supervised. Tummy Time will help make your baby's neck and shoulder muscles stronger and will help prevent flat spots on the head.

Q. Will my baby get flat spots on the back of his or her head from back sleeping?

A. Usually, flat spots on the back of a baby's head are temporary. They should go away in a few months once the baby begins to sit up. Tummy Time, when your baby is awake, is a good way to reduce flat spots. Parents and caregivers may also wish to alternate the baby's head position when he or she is placed to sleep so that the baby is not always sleeping on the same side of the head, and they can periodically move the crib around the room so the baby has to turn his or her head in different directions to see what's going on. They should also hold the baby upright when he or she is awake and should limit the amount of time the baby spends in car seats, swings, carriers, and bouncy seats.¹⁵³ All of these actions can help to prevent flat spots on the back of the head.

Q. What should I do when my baby starts to roll over on his or her own?

A. Babies should be placed on their backs to sleep, but when they are able to roll over on their own, they should be allowed to adopt whatever sleep position they prefer after they are asleep.* If the baby has rolled over from his or her back to the side or stomach on his or her own during sleep, it is not necessary to reposition the infant to the back position.

*American Academy of Pediatrics. Healthy Child Care America *Back to Sleep* Campaign (2003). Available online at http://www.healthychildcare.org/pdf/bts_factsheet.pdf

Sources: Adapted from Eunice Kennedy Shriver National Institute of Child Health and Human Development, *Back to Sleep Campaign*. (2005). *Safe Sleep for Your Baby: Reduce the Risk of Sudden Infant Death Syndrome (SIDS)*. NIH Pub No. 05-7040; and Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116, 1245–1255.

CAN A BABY EVER BE PLACED TO SLEEP ON HIS OR HER STOMACH OR SIDE?

There are few circumstances in which a doctor might recommend that a baby should be placed to sleep on his or her stomach or side. Studies of babies with certain medical disorders, such as upper-airway malformations (e.g., Robin Syndrome) or severe gastroesophageal reflux, show that these infants experience fewer problems when lying on their stomachs. These babies may also benefit from sleeping in the stomach position with the head elevated. However, no recent literature supports or refutes the benefits of this therapy.

If you have concerns about possible choking for the first few hours following birth, you can place the baby on his or her side, propped up against the side of the bassinet for stability. But the AAP Task Force on SIDS recommends that after several hours the baby be placed wholly on his or her back to sleep.

Nurses and other health care providers should consider the potential benefit to the baby when recommending infant sleep position. If a health care provider decides that a baby should sleep on his or her stomach or side because of a medical condition or other concern, be sure to advise parents and caregivers to reduce SIDS risk in other ways, such as avoiding soft bedding and ensuring that the baby does not overheat. For most babies, however, side sleeping is not advised.

Source: Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116, 1245–1255.

Encouraging Parents To Take Action

Studies show that patients are more likely to recall and comply with instructions when a health care provider uses a positive tone, provides adequate information, and allows the patient to ask most of the questions.¹⁵⁴ These findings suggest that the way in which nurses deliver SIDS risk-reduction messages has a significant impact on whether parents follow the advice they receive.

You may want to seek guidance from various theories of health behavior when talking to parents about safe infant-sleeping practices. According to one well-accepted theory,* watching the positive actions of others serves as a powerful motivator and predictor of parent compliance. The heart of this theory is that people tend to imitate behavior that they have recently seen. To encourage this kind of learning through observation, you need to ensure that the following four conditions are met:¹⁵⁵

- 1. Attention.** Finding an optimal time for education when the parents are alert will increase attention to the message. Anything that diverts attention decreases learning. In terms of SIDS risk reduction, for example, a parent who is fatigued, distracted, or overwhelmed following childbirth is less likely to learn well. Therefore, you may want to start educating parents about SIDS before the baby is born, again when the baby comes home, and once more during the immediate postpartum period.
- 2. Retention.** For SIDS risk-reduction recommendations to be retained, it is vital that you consistently model the behavior of placing infants on their backs to sleep. To retain (or remember) what is observed, imagery and language are important: People store what they have seen in the form of mental images or verbal descriptions. When stored, parents can later “bring up” the image or description so that they can reproduce it with their own behavior.
- 3. Reproduction.** You need to provide opportunities for parents to practice placing their baby in the back sleep position and then provide feedback and encouragement. Parents must model the behavior that nurses have demonstrated: putting their baby to sleep on his or her back, in a crib free of loose bedding, and wearing only sleep clothing and no blanket. Role-playing with parents can also help them practice communicating to grandparents and others about why back sleeping is safest.
- 4. Motivation.** Convincing parents of the benefits of the practice is critical to their motivation to implement the recommendations. To do so, nurses should:
 - Provide convincing arguments for placing infants to sleep on their backs (called past reinforcement or traditional behaviorism);
 - Demonstrate how easy it is to do (called promised reinforcement); and
 - Reinforce that parents are doing what is best for their baby and that they should continue to do so until the child’s first birthday (called vicarious reinforcement).

Nurses can reinforce parents’ confidence and interest in performing new skills by providing ongoing encouragement and praise.

*Social Cognitive Theory or Social Learning Theory

Delivering Messages

Research conducted over the past 30 years has revealed that SIDS is an extraordinarily complex problem. Eliminating SIDS will require a multidisciplinary approach involving nurses, pediatricians, epidemiologists, pathologists, neuroscientists, geneticists, infectious disease experts, and other health care providers as well as parents and caregivers. Research has also shown that prenatal and daily infant care practices play a critical role in SIDS risk reduction.¹⁵⁶

The most critical period during which nurses can influence parents' behaviors is the first 24 to 48 hours following delivery.¹⁵⁷ In addition, building a foundation for back sleeping during pregnancy is one way to ensure that parents hear and heed SIDS risk-reduction messages.

Nurses can influence parents on a wide variety of health care practices. With respect to helping a family reduce its newborn's risk of SIDS, a nurse can:

- Ask about how and where the baby will be sleeping when he or she sees the parents during prenatal care visits;

- Provide education during pregnancy about SIDS risk-reduction;

- Model behavior by placing the infant on his or her back to sleep in the nursery;

- Reinforce the SIDS risk-reduction message following the infant's birth;

- Monitor the infant's sleep position by asking the parents about it during every office visit and through periodic phone calls; and

- Help parents modify the crib and home environment according to SIDS risk-reduction recommendations, if needed.¹⁵⁸

Research shows that about one-third of parents who place infants on their backs at one month switch to the stomach sleeping position by the time the infant is three months old.^{159, 160} This choice is a dangerous one because infants who get used to the back sleeping position and who are then placed on their stomachs are *at higher risk of SIDS* than if they had always been placed on their stomachs.¹⁶¹ This finding highlights the necessity for nurses to discuss infant sleep position well after an infant's birth. It is critical that nurses continue to provide support, when possible, up to a full year after the infant's birth to ensure that families are using the back sleeping position at home.¹⁶²

If possible, follow-up education and activities should be offered to parents and caregivers where their daily activities take place, such as at women's wellness clinics, well-child clinics, and community health centers.

Session 2: Take-Away Messages



- Nurses are in a powerful position to influence parents' behavior by modeling safe sleep practices, especially during the 24 to 48 hours following delivery, and by following up with families throughout the baby's first year to ensure that they are using the back sleeping position at home.
- Evidence shows that parents and caregivers use the same sleep position for their babies at home that they see used at the hospital. Because nurses play a key role in caring for the infant immediately after birth, nurses provide the perfect channel for reaching parents and families with safe sleep messages by putting words into action.
- SIDS rates vary across racial and ethnic groups in the United States, and infant care often has its roots in tradition and experience. It is important that advice on SIDS risk reduction be as clear and as culturally appropriate as possible.
- Parents may have concerns about back sleeping, such as fear of aspiration, concern for the infant's comfort, worries about a flattened skull, and contrary advice from others. It is important to counter these arguments with accurate, science-based statements.
- For a complete list of safe sleep recommendations, please see page 18. There is also a sheet with the risk-reduction strategies in the pocket on the inside back cover of this booklet for you to copy and share with parents and families.

Additional Resources

Listed below are selected resources that provide public and professional education materials about SIDS.

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

Back to Sleep Campaign
Phone: 1-800-505-CRIB (2742)
TTY: 1-888-320-6942
Fax: 1-866-760-5947
Mail: 31 Center Drive, Building 31,
Room 2A32, Bethesda, MD 20892
Internet: <http://www.nichd.nih.gov/SIDS>

American Academy of Pediatrics (AAP)

Phone: (847) 434-4000
Fax: (847) 434-8000
Mail: 141 Northwest Point Boulevard,
Elk Grove Village, IL 60007-1098
Internet: <http://www.aap.org/healthtopics/Sleep.cfm>

Association of SIDS and Infant Mortality Programs

Phone: (631) 444-3690
Fax: (631) 444-6475
Mail: School of Social Welfare, Stony Brook
University, Stony Brook, NY 11794-8232
Internet: <http://www.asip1.org>

C.J. Foundation for SIDS

Phone: 1-888-8CJ-SIDS or (201) 996-5111
Fax: (201) 996-5326
Mail: The Don Imus-WFAN Pediatric Center,
Hackensack University Medical Center,
30 Prospect Avenue, Hackensack, NJ 07601
Internet: <http://www.cjsids.com>

First Candle/SIDS Alliance

National SIDS and Infant Death
Program Support Center
Phone: 1-800-221-7437 or (410) 653-8226
Fax: (410) 653-8709
Mail: 1314 Bedford Avenue, Suite 210,
Baltimore, MD 21208
Internet: <http://www.sidsalliance.org>

Health Resources and Services Administration (HRSA)

Maternal and Child Health Bureau
Phone: (301) 443-2170
Fax: (301) 443-1797
Mail: Parklawn Building, Room 18-05,
5600 Fishers Lane, Rockville, MD 20857
Internet: <http://mchb.hrsa.gov/programs/default.htm>

National SIDS & Infant Death Project IMPACT

Phone: 1-800-930-SIDS (7437) or (703) 902-1260
Fax: (703) 902-1320
Mail: 8280 Greensboro Drive, Suite 300,
McLean, VA 22102
Internet: <http://www.sidsprojectimpact.com>

National SIDS/Infant Death Resource Center

Phone: 1-866-866-7437 or (703) 821-8955
Fax: (703) 821-2098
Mail: 8280 Greensboro Drive, Suite 300,
McLean, VA 22102
Internet: <http://www.sidscenter.org/>

U.S. Consumer Product Safety Commission

Phone: (301) 504-7923
Fax: (301) 504-0124
Mail: 4330 East West Highway,
Bethesda, MD 20814-4408
Internet: <http://www.cpsc.gov>
Cr b Safety and SIDS Reduction:
<http://www.cpsc.gov/CPSC/PUBS/PUBS/cribsafe.html>

Acknowledgments

Many researchers, organizations, nurses, and nursing organizations collaborated with the NICHD to develop this CE program. For their valuable input, the NICHD would like to thank:

Academy of Neonatal Nursing

<http://www.academyonline.org>

American College of Nurse-Midwives

<http://www.acnm.org>

Association of SIDS and Infant Mortality Programs

<http://www.asip1.org>

Association of Women's Health, Obstetric and Neonatal Nurses

<http://www.awhonn.org>

March of Dimes

<http://www.marchofdimes.com>

First Candle/SIDS Alliance

<http://www.sidsalliance.org>

National Alaska Native/American Indian Nurses Association

<http://www.nanainurses.org>

National Association of Neonatal Nurses

<http://www.nann.org>

National Association of Pediatric Nurse Practitioners

<http://www.napnap.org>

National Institute of Nursing Research, National Institutes of Health

<http://ninr.nih.gov/ninr>

Society of Pediatric Nursing

<http://www.pedsnurses.org/all.php>

Washington State Department of Health

<http://www.doh.wa.gov>

PRE-TEST ANSWER KEY

1. A 2. D 3. D 4. C 5. B 6. D 7. D 8. D 9. C 10. D

References

- ¹ Willinger, M., James, L.S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11(5), 677–684.
- ² Centers for Disease Control and Prevention, DHHS. (2005). *Sudden Infant Death Syndrome* [Electronic version]. Retrieved June 30, 2005, from <http://www.cdc.gov/reproductivehealth/SIDS/index.htm>
- ³ Willinger, M., Ko, C.W., Hoffman, H.J., Kessler, R.C., & Corwin, M.G. (2000). Factors associated with caregivers' choice of infant sleep position: The National Infant Sleep Position Study. *Journal of the American Medical Association*, 283, 2135–2142.
- ⁴ Hauck, F.R., Moore, C.M., Herman, S.M., et al. (2002). The contribution of prone sleeping position to the racial disparity in sudden infant death syndrome: The Chicago Infant Mortality Study. *Pediatrics*, 110, 772–780.
- ⁵ Willinger, M., James, L.S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11(5), 677–684.
- ⁶ Valdes-Dapera, M. (1995). The postmortem evaluation. *Pediatric Annals*, July 24 (7), 365–372.
- ⁷ Willinger, M., James, L.S., & Catz, C. (1991). Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*, 11(5), 677–684.
- ⁸ American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
- ⁹ Centers for Disease Control and Prevention, DHHS. (2005). CDC Wonder. *Compressed mortality file: Underlying cause of death. Mortality for 1979–1998 with ICD 9 codes; Mortality for 1999–2001 with ICD 10 codes* [Electronic version]. Retrieved November 9, 2005, from <http://wonder.cdc.gov/mortSQL.html>
- ¹⁰ Maternal and Child Health Bureau, HRSA, DHHS. *What is SIDS? National SIDS/Infant Death Resource Center* [Electronic version]. Retrieved July 5, 2005, from http://www.sidscenter.org/SIDSFACT_EN.htm
- ¹¹ Panigrahy, A., Filiano, J., Sleeper, L.A., et al. (2000). Decreased serotonergic receptor binding in rhombic lip-derived regions of the medulla oblongata in the SIDS. *Journal of Neuropathology and Experimental Neurology*, 59, 377–384.
- ¹² Opdal, S.H., & Rognum, T.O. (2004). The sudden infant death syndrome gene: Does it exist? *Pediatrics*, 114(4), 506–512.
- ¹³ Roe, C.R., Millington, D.S., Maltby, D.A., & Wellman, R.B. (1987). Post-mortem recognition of inherited metabolic disorders from specific acylcarnitines in tissue in cases of sudden infant death. *Lancet*, 1(8531), 512.
- ¹⁴ Opdal, S.H., & Rognum, T.O. (2004). The sudden infant death syndrome gene: Does it exist? *Pediatrics*, 114(4), 506–512.
- ¹⁵ Opdal, S.H., & Rognum, T.O. (2004). The sudden infant death syndrome gene: Does it exist? *Pediatrics*, 114(4), 506–512.
- ¹⁶ Arnestad, M., Andersen, M., Vege, A., & Rognum, T.O. (2001). Changes in the epidemiological pattern of sudden infant death syndrome in southeast Norway, 1984–1998: Implications for future prevention and research. *Archives of Disease in Childhood*, 85, 108–115.
- ¹⁷ Filiano, J.J., & Kinney, H.C. (1994). A perspective on neuropathologic findings in victims of the sudden infant death syndrome: The triple-risk model. *Biology of the Neonate*, 65(3–4), 194–197.
- ¹⁸ Filiano, J.J., & Kinney, H.C. (1994). A perspective on neuropathologic findings in victims of the sudden infant death syndrome: The triple-risk model. *Biology of the Neonate*, 65(3–4), 194–197.
- ¹⁹ American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (1992). Infant positioning and SIDS. *Pediatrics*, 89, 1120–1126.
- ²⁰ American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (1996). Positioning and sudden infant death syndrome (SIDS): Update. *Pediatrics*, 98(6), 1216–1218.
- ²¹ National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS. (2006). *Table 4: Number of infant deaths, percentage of total infant deaths, and infant mortality rates for 2003, and percentage change in infant mortality rates from 2002 to 2003 for the 10 leading causes of infant death in 2003: United States* [Electronic version]. Retrieved April 18, 2006, from http://www.cdc.gov/nchs/data/hestat/finaldeaths03_tables.pdf
- ²² Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (2006). *The usual position in which mothers place their babies to sleep: Data from the NISP survey for years 1992–2005* [Electronic version]. Retrieved April 18, 2006, from http://dccwww.bumc.bu.edu/ChimeNisp/Tables_in_PDF/NISP%201992-2005%20The%20usual%20sleep%20position.pdf
- ²³ American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
- ²⁴ Mathews, T.J., Menacker, F., & MacDorman, M.F. (2003). Infant mortality statistics from the 2001 period linked birth/infant death data set. *National Vital Statistics Reports*, 52(2) [Electronic version]. Retrieved June 30, 2005, from http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_02.pdf
- ²⁵ Willinger, M., Ko, C.W., Hoffman, H.J., Kessler, R.C., & Corwin, M.G. (2000). Factors associated with caregivers' choice of infant sleep position: The National Infant Sleep Position Study. *Journal of the American Medical Association*, 283, 2135–2142.
- ²⁶ Alexander, D. (1997, October). *Back to Sleep—A public-private partnership to reduce the risk of SIDS*. Presented at the national conference and exhibition of the American Academy of Pediatrics, New Orleans, LA.
- ²⁷ Centers for Disease Control and Prevention, DHHS (2005). CDC Wonder. *Compressed mortality for the years 1979–1998 with ICD 9 codes* [Electronic version]. Retrieved April 18, 2006, from <http://wonder.cdc.gov/mortcid9.html>
- ²⁸ Centers for Disease Control and Prevention, DHHS. CDC Wonder. *Compressed mortality for the years 1999–2002 with ICD 10 codes* [Electronic version]. Retrieved April 18, 2006, from <http://wonder.cdc.gov/mortcid10j.html>
- ²⁹ National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS. (2006). *Deaths: Final data for 2003* [Electronic version]. Retrieved March 8, 2006, from http://www.cdc.gov/nchs/data/hestat/finaldeaths03_tables.pdf#4
- ³⁰ Willinger, M., Ko, C.W., Hoffman, H.J., Kessler, R.C., & Corwin, M.G. (2000). Factors associated with caregivers' choice of infant sleep position: The National Infant Sleep Position Study. *Journal of the American Medical Association*, 283, 2135–2142.

31. Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (1992–2004). Collaborative Home Infant Monitoring Evaluation (CHIME) and the National Infant Sleep Position Study (NISP). *The usual position in which mothers place their babies to sleep: Data from the NISP telephone survey for the years 1992–2004* [Electronic version]. Retrieved July 5, 2005, from http://dccwww.bumc.bu.edu/chimenisp/Tables_in_PDF/NISP%2019922004%20The%20usual%20sleep%20position.pdf
32. Mathews, T.J., Menacker, F., & MacDorman, M.F. (2003). Infant mortality statistics from the 2001 period linked birth/infant death data set. *National Vital Statistics Reports*, 52(2) [Electronic version]. Retrieved June 30, 2005, from http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_02.pdf
33. Centers for Disease Control and Prevention, DHHS. (2005). CDC Wonder. *Compressed mortality file: Underlying cause of death. Mortality for 1979–1998 with ICD 9 codes; Mortality for 1999–2001 with ICD 10 codes* [Electronic version]. Retrieved February 23, 2005, from <http://wonder.cdc.gov/mortSQL.html>
34. Mathews, T.J., Menacker, F., & MacDorman, M.F. (2003). Infant mortality statistics from the 2001 period linked birth/infant death data set. *National Vital Statistics Reports*, 52(2) [Electronic version]. Retrieved June 30, 2005, from http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_02.pdf
35. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
36. Willinger, M., Hoffman, H.J., Wu, K., et al. (1998). Factors associated with the transition to nonprone sleep positions of infants in the United States. *Journal of the American Medical Association*, 280, 329–335.
37. Iyasu, S., Randall, L.L., Welty, T.K., Hsia, J., Kinney, H.C., Mandell, F., et al. (2002). Risk factors for sudden infant death syndrome among Northern Plains Indians. *Journal of the American Medical Association*, 288, 2717–2723.
38. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
39. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
40. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
41. U.S. Consumer Product Safety Commission. *Crib Safety Tips: Use Your Crib Safely* [Electronic version]. Retrieved July 5, 2005, from <http://www.cpsc.gov/CPSC/PUBS/5030.html>
42. Fleming, P.J., Gilbert, R., & Azaz, Y. (1990). Interaction between bedding and sleeping position in the sudden infant death syndrome: A population-based case-control study. *British Medical Journal*, 301, 85–89.
43. Gilbert, R., Rudd, P., & Berry, P.J. (1992). Combined effect of infection and heavy wrapping on the risk of sudden unexpected infant death. *Archives of Disease in Childhood*, 67, 171–177.
44. Ponsonby, A.L., Dwyer, T., Gibbons, L., Cochrane, J.A., Jones, M.E., & McCall, M.J. (1992). Thermal environment and SIDS: Case-control study. *British Medical Journal*, 304, 277–282.
45. Ponsonby, A.L., Dwyer, T., Gibbons, L.E., Cochrane, J.A., & Wang, Y.G. (1993). Factors potentiating the risk of sudden infant death syndrome associated with prone position. *New England Journal of Medicine*, 329, 377–382.
46. Williams, S.M., Taylor, B.J., & Mitchell, E.A. (1996). Sudden infant death syndrome: Insulation from bedding and clothing and its effect modifiers. *International Journal of Epidemiology*, 25, 277–282.
47. Fleming, P.J., Gilbert, R., & Azaz, Y. (1990). Interaction between bedding and sleeping position in the sudden infant death syndrome: A population based case-control study. *British Medical Journal*, 301, 85–89.
48. Gilbert, R., Rudd, P., & Berry, P.J. (1992). Combined effect of infection and heavy wrapping on the risk of sudden unexpected infant death. *Archives of Disease in Childhood*, 67, 171–177.
49. Ponsonby, A.L., Dwyer, T., Gibbons, L., Cochrane, J.A., Jones, M.E., & McCall, M.J. (1992). Thermal environment and SIDS: Case-control study. *British Medical Journal*, 304, 277–282.
50. Ponsonby, A.L., Dwyer, T., Gibbons, L.E., Cochrane, J.A., & Wang, Y.G. (1993). Factors potentiating the risk of sudden infant death syndrome associated with prone position. *New England Journal of Medicine*, 329, 377–382.
51. Williams, S.M., Taylor, B.J., & Mitchell, E.A. (1996). Sudden infant death syndrome: Insulation from bedding and clothing and its effect modifiers. *International Journal of Epidemiology*, 25, 277–282.
52. Malloy, M.H., & Freeman, D.H. (2004). Age at death, season, and day of death as indicators of the effect of the back to sleep program on sudden infant death syndrome in the United States, 1992–1999. *Archives of Pediatric and Adolescent Medicine*, 158, 359–365.
53. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
54. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
55. Ariagno, R. (1994). *Smoking and the risk for SIDS* [Electronic version]. Retrieved July 5, 2005, from <http://sids-network.org/experts/smok.htm>
56. Schoendorf, K.C., & Kiely, J.L. (1992). Relationship of sudden infant death syndrome to maternal smoking during and after pregnancy. *Pediatrics*, 90(6), 905–908.
57. Ariagno, R. (1994). *Smoking and the risk for SIDS* [Electronic version]. Retrieved July 5, 2005, from <http://sids-network.org/experts/smok.htm>
58. McMartin, K.I., Platt, M.S., & Hackman, R. (2002). Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS). *Journal of Pediatrics*, 140, 205–209.
59. McMartin, K.I., Platt, M.S., & Hackman, R. (2002). Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS). *Pediatrics*, 140, 205–209.
60. Anderson, H.R., & Cook, D.G. (1999). Passive smoking and sudden infant death syndrome: Review of the epidemiological evidence. *Thorax*, 54, 365–366.

REFERENCES Continued

61. Willinger, A., Ko, C., Hoffman, H., Kessler, R., & Corwin, M. (2003). Trends in infant bed sharing in the United States, 1993–2000: The National Infant Sleep Position Study. *Archives of Pediatric and Adolescent Medicine*, 157, 43–49.
62. Willinger, A., Ko, C., Hoffman, H., Kessler, R., & Corwin, M. (2003). Trends in infant bed sharing in the United States, 1993–2000: The National Infant Sleep Position Study. *Archives of Pediatric and Adolescent Medicine*, 157, 43–49.
63. Scragg, R., Mitchell, E.A., Taylor, B.J., et al. (1993). Bed sharing, smoking, and alcohol in the sudden infant death syndrome: New Zealand Cot Death Study Group. *British Medical Journal*, 307(6915), 1312–1318.
64. Kemp, J.S., Livne, M., White, D.K., & Arfken, C.L. (1998). Softness and potential to cause rebreathing: Differences in bedding used by infants at high and low risk for sudden infant death syndrome. *Pediatrics*, 132(2), 234–239.
65. Ponsonby, A.L., Dwyer, T., Couper, D., & Cochrane, J. (1998). Association between the use of a quilt and sudden infant death syndrome: Case-control study. *British Medical Journal*, 316, 195–196.
66. Blair, P.S., Fleming, P.J., Smith, I.J., Platt, M.W., Young, J., Nadin, P., et al. (1999). Babies sleeping with parents: Case-control study of factors influencing the risk of sudden infant death syndrome. *British Medical Journal*, 319(7223), 1457–1462.
67. Hauck, F.R., Herman, S.M., Donovan, M., Iyasu, S., Moore, C.M., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(Suppl. 5), 1207–1214.
68. Scheers, N.J., Rutherford, G.W., & Kemp, J.S. (2003). Where should infants sleep? A comparison of risk for suffocation of infants sleeping in cribs, adult beds, and other sleeping locations. *Pediatrics*, 112(4), 883–889.
69. Carpenter, R.G., Irgens, L.M., Blair, P.S., England, P.D., Fleming, P., Huber, J., et al. (2004). Sudden unexplained infant death in 20 regions in Europe: Case-control study. *Lancet*, 363, 185–191.
70. Matthews, T., McDonnell, M., McGarvey, C., Loftus, G., & O'Regan, M. (2004). A multivariate "time based" analysis of SIDS risk factors. *Archives of Disease in Childhood*, 89, 267–271.
71. Hauck, F.R., Herman, S.M., Donovan, M., Iyasu, S., Moore, C.M., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(Suppl. 5), 1207–1214.
72. Carpenter, R.G., Irgens, L.M., Blair, P.S., England, P.D., Fleming, P., Huber, J., et al. (2004). Sudden unexplained infant death in 20 regions in Europe: Case-control study. *Lancet*, 363, 185–191.
73. Tappin, D.M., Ecob, R., & Brooke, H. (2005). Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case-control study. *Journal of Pediatrics*, 147(1), 32–37.
74. Blair, P.S., Fleming, P.J., Smith, I.J., Platt, M.W., Young, J., Nadin, P., et al. (1999). Babies sleeping with parents: Case-control study of factors influencing the risk of sudden infant death syndrome. *British Medical Journal*, 319(7223), 1457–1462.
75. Mitchell, E.A., & Thompson, J.M.D. (1995). Co-sleeping increases the risk of SIDS, but sleeping in the parents' bedroom lowers it. In T.O. Rognum (Ed.), *Sudden Infant Death Syndrome: New Trends in the Nineties* (pp. 266–269). Oslo, Norway: Scandinavian University Press.
76. Blair, P.S., Fleming, P.J., Smith, I.J., Platt, M.W., Young, J., Nadin, P., et al. (1999). Babies sleeping with parents: Case-control study of factors influencing the risk of sudden infant death syndrome. *British Medical Journal*, 319(7223), 1457–1462.
77. Carpenter, R.G., Irgens, L.M., Blair, P.S., England, P.D., Fleming, P., Huber, J., et al. (2004). Sudden unexplained infant death in 20 regions in Europe: Case-control study. *Lancet*, 363, 185–191.
78. Tappin, D.M., Ecob, R., & Brooke, H. (2005). Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case-control study. *Journal of Pediatrics*, 147(1), 32–37.
79. Li, D.K., Pettiti, D.B., Willinger, M., McMahon, R., Odouli, R., Vu, H., & Hoffman, H.J. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
80. Mitchell, E.A., Thach, B.T., Thompson, J.M.D., & Williams, S. (1999). Changing infants' sleep position increases risk of sudden infant death syndrome. *Archives of Pediatric and Adolescent Medicine*, 153(11), 1136–1141.
81. Moon, R.Y., & Oden, R.P. (2003). Back to Sleep: Can we influence child care providers? *Pediatrics*, 112(4), 878–882.
82. Ehrle, J., Adams, G., & Tout, K. (2001). *Who's caring for our youngest children? Child care patterns of infants and toddlers*. Washington, DC: The Urban Institute.
83. Moon, R.Y., Patel, K.M., & Shaefer, S.J. (2000). Sudden infant death syndrome in child care settings. *Pediatrics*, 106(2), 295–300.
84. Gershon, N.B., & Moon, R.Y. (1997). Infant sleep position in licensed child care centers. *Pediatrics*, 100(1), 75–78.
85. Moon, R.Y., Weese-Mayer, D.E., & Silvestri, J.M. (2003). Nighttime child care: Inadequate sudden infant death syndrome risk factor knowledge, practice, and policies. *Pediatrics*, 111, 795–799.
86. Moon, R.Y., Weese-Mayer, D.E., & Silvestri, J.M. (2003). Nighttime child care: Inadequate sudden infant death syndrome risk factor knowledge, practice, and policies. *Pediatrics*, 111, 795–799.
87. Moon, R.Y., Biliter, W.M., & Croskell, S.E. (2001). Examination of state regulation regarding infants and sleep in licensed child care centers and family child care settings. *Pediatrics*, 107, 1029–1036.
88. Moon, R.Y., & Oden, R.P. (2003). Back to Sleep: Can we influence child care providers? *Pediatrics*, 112(4), 878–882.
89. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
90. Carroll, J.L., & Siska, E.S. (1998). SIDS: Counseling parents to reduce the risk. *American Family Physician*, 57, 1566–1567.
91. Davies, D.P. (1985). Cot death in Hong Kong: A rare problem? *Lancet*, 2, 1346–1348.
92. Lee, N.N., Chan, Y.F., Davies, D.P., Lau, E., & Yip, D.C. (1989). Sudden infant death syndrome in Hong Kong: Confirmation of low incidence. *British Medical Journal*, 298(6675), 721.
93. Sahni, R., Saluja, D., Schulze, K.F., Kashyap, S., Ohira-Kist, K., Fifer, W.P., & Myers, M.M. (2002). Quality of diet, body position, and time after feeding influence behavioral states in low birth weight infants. *Pediatric Research*, 52, 399–404.
94. Kahn, A., Groswasser, J., Franco, P., Scaillet, S., Sawaguchi, T., Kelmanson, I., & Dan, B. (2003). Sudden infant deaths: Stress, arousal, and SIDS. *Early Human Development*, 75(Suppl.), 147–166.
95. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
96. Davis, B.E., Moon, R.Y., Sachs, H.C., & Ottolini, M.C. (1998). Effects of sleep position on infant motor development. *Pediatrics*, 102(5), 1135–1140.

97. Hunt, C.E., Lesko, S.M., Vezina, R.M., McCoy, R., Corwin, M.J., Mandell, F., et al. (2003). Infant sleep position and associated outcomes. *Archives of Pediatric and Adolescent Medicine*, 157, 469–474.
98. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
99. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
100. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
101. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
102. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
103. Hunt, C.D., & Puczynski, M.S. (1996). Does supine sleeping cause asymmetric heads? *Pediatrics*, 98, 127–129.
104. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
105. Persing, J., James, H., Swanson, J., & Kattwinkel, J. (2003). Prevention and management of positional skull deformities in infants. *Pediatrics*, 112(1), 199–202.
106. Franco, P., Scaillet, S., Wermenbol, V., Valente, F., Groswasser, J., & Kahn, A. (2000). The influence of a pacifier on infants' arousals from sleep. *Journal of Pediatrics*, 136, 775–779.
107. Horne, R.S., Parslow, P.M., Ferens, D., Watts, A.M., & Adamson, T.M. (2004). Comparison of evoked arousability in breast and formula fed infants. *Archives of Disease in Childhood*, 89, 22–25.
108. Mitchell, E.A., Tuohy, P.G., Brunt, J.M., Thompson, J.M.D., Clements, M.S., Stewart, A.W., et al. (1997). Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: A prospective study. *Pediatrics*, 100(5), 835–840.
109. Wennergren, G., Alm, B., Oyen, N., Helweg-Larsen, K., Milerad, J., Skjaerven, R., et al. (1997). The decline in the incidence of SIDS in Scandinavia and its relation to risk-intervention campaigns: Nordic Epidemiological SIDS Study. *Acta Paediatrica*, 86(9), 963–968.
110. L'Hoir, M.P., Engelberts, A.C., van Well, G.T.J., Westers, P., Mellenbergh, G.J., Wolters, W.H.G., & Huber, J. (1998). Case-control study of current validity of previously described risk factors for SIDS in the Netherlands. *Archives of Disease in Childhood*, 79, 386–393.
111. Tappin, D., Brooke, H., Ecob, R., & Gibson, A. (2002). Used infant mattresses and sudden infant death syndrome in Scotland: Case-control study. *British Medical Journal* 325, 1007.
112. Hauck, F.R., Herman, S.M., Donovan, M., Iyasu, S., Moore, C.M., Donoghue, E., et al. (2003). Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago Infant Mortality Study. *Pediatrics*, 111(Suppl. 5), 1207–1214.
113. Chen, A., & Rogan, W.J. (2004). Breastfeeding and the risk of postneonatal death in the United States. *Pediatrics*, 113(5), e435–e439.
114. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
115. Fleming, P.J., Blair, P.S., Pollard, K., Platt, M.W., Leach, C., Smith, I., Berry, P.J., & Golding, J. (1999). Pacifier use and sudden infant death syndrome: Results from the CESDI/SUDI case-control study. *Archives of Disease in Childhood*, 81(2), 112–116.
116. Hauck, F.R., Omojokun, O.O., & Siadat, M.S. (2005). Do pacifiers reduce the risk of sudden infant death syndrome? A meta-analysis. *Pediatrics*, 116, 716–723.
117. Franco, P., Scaillet, S., Wermenbol, V., Valente, F., Groswasser, J., & Kahn, A. (2000). The influence of a pacifier on infants' arousals from sleep. *Journal of Pediatrics*, 136, 775–779.
118. Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. *National Infant Sleep Position study data: Sleep position 1992–2004 (all races and ethnic groups)* [Electronic version]. Retrieved March 7, 2006, from http://dccwww.bumc.bu.edu/ChimeNisp/Tables_in_PDF/NISP%201992-2004%20The%20usual%20sleep%20position.pdf
119. Bullock, L.F., Mickey, K., Green, J., & Heine, A. (2004). Are nurses acting as role models for the prevention of SIDS? *The American Journal of Maternal Child Nursing*, 29(3), 172–177.
120. Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall, Inc.
121. Pastore, G., Guala, A., Zaffaroni, M., & Bona, G. (2003). Back to Sleep: Risk factors for SIDS as targets for public health campaigns. *Pediatrics*, 109(4), 453–454.
122. Colson, E.R., & Cohen, J.S. (2002). Changing nursery practice gets inner-city infants in the supine position to sleep. *Archives of Pediatric & Adolescent Medicine*, 156, 717–720.
123. Peeke, K., Hershberger, C.M., Kuehn, D., & Levett, J. (1999). Infant sleep position: Nursing practice and knowledge. *The American Journal of Maternal Child Nursing*, 24(6), 301–304.
124. Bullock, L.F., Mickey, K., Green, J., & Heine, A. (2004). Are nurses acting as role models for the prevention of SIDS? *The American Journal of Maternal Child Nursing*, 29(3), 172–177.
125. Hein, H.A., & Pettit, S.F. (2001). Back to Sleep: Good advice for parents but not for hospitals? *Pediatrics*, 107, 537–539.
126. Colson, E.R., Stille, C.J., Payton, J., Bernstein, B., & Dworkin, P. (2000). Not yet “back to sleep”: Sleep position for infants in two inner-city clinics. *Ambulatory Child Health*, 6, 269–275.
127. Stastny, P.F., Ichinose, T.Y., Thayer, S.D., Olson, R.J., & Keens, T.G. (2004). Infant sleep positioning by nursery staff and mothers in newborn hospital nurseries. *Nursing Research*, 53(2), 122–129.
128. Bullock, L.F., Mickey, K., Green, J., & Heine, A. (2004). Are nurses acting as role models for the prevention of SIDS? *The American Journal of Maternal Child Nursing*, 29(3), 172–177.
129. Colson, E.R., & Cohen, J.S. (2002). Changing nursery practice gets inner-city infants in the supine position to sleep. *Archives of Pediatric and Adolescent Medicine*, 156, 717–720.
130. Colson, E.R., & Cohen, J.S. (2002). Changing nursery practice gets inner-city infants in the supine position to sleep. *Archives of Pediatric & Adolescent Medicine*, 156, 717–720.

REFERENCES Continued

- ^{131.} Boschert, S. (2004). Mother's race a factor in infant sleep positioning: Expand education efforts. *Family Practice News*, 34(2), 57.
- ^{132.} Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. *National Infant Sleep Position study data: Sleep position 1992–2004 (black mothers)* [Electronic version]. Retrieved March 7, 2006, from [http://dccwww.bumc.bu.edu/ChimeNisp/Tables_in_PDF/NISP%201992-2004%20The%20usual%20sleep%20position%20\(blacks\).pdf](http://dccwww.bumc.bu.edu/ChimeNisp/Tables_in_PDF/NISP%201992-2004%20The%20usual%20sleep%20position%20(blacks).pdf)
- ^{133.} Iyasu, S., Randall, L.L., Welty, T.K., Hsia, J., Kinney, H.C., Mandell, F., et al. (2002). Risk factors for sudden infant death syndrome among Northern Plains Indians. *Journal of the American Medical Association*, 288, 2717–2723.
- ^{134.} Willinger, A., Ko, C., Hoffman, H., Kessler, R., & Corwin, M. (2003). Trends in infant bed sharing in the United States, 1993–2000: The National Infant Sleep Position Study. *Archives of Pediatric & Adolescent Medicine*, 157, 43–49.
- ^{135.} Willinger, A., Ko, C., Hoffman, H., Kessler, R., & Corwin, M. (2003). Trends in infant bed sharing in the United States, 1993–2000: The National Infant Sleep Position Study. *Archives of Pediatric & Adolescent Medicine*, 157, 43–49.
- ^{136.} Boschert, S. (2004). Mother's race a factor in infant sleep positioning: Expand education efforts. *Family Practice News*, 34(2), 57.
- ^{137.} Boschert, S. (2004). Mother's race a factor in infant sleep positioning: Expand education efforts. *Family Practice News*, 34(2), 57.
- ^{138.} Hauck, F., Moore, C., Herman, S., Donovan, M., Kalelkar, M., Christoffel, K., et al. (2002). The contribution of prone sleeping to the racial disparity in sudden infant death syndrome: The Chicago Infant Mortality Study. *Pediatrics*, 110(4), 772–780.
- ^{139.} Moon, R.Y., Cheng, T.L., Patal, K.M., Baumhaft, K., & Scheidt, P. (1998). Parental literacy level and understanding of medical information. *Pediatrics*, 102(2), 25.
- ^{140.} Moon, R.Y., Cheng, T.L., Patal, K.M., Baumhaft, K., & Scheidt, P. (1998). Parental literacy level and understanding of medical information. *Pediatrics*, 102(2), 25.
- ^{141.} Moon, R.Y., & Omon, R. (2002). Determinants of infant sleep position in an urban population. *Clinical Pediatrics*, 41(8), 569.
- ^{142.} Hunt, C.E., Lesko, S.M., Vezina, R.M., McCoy, R., Corwin, M.J., Mandell, F., et al. (2003). Infant sleep position and associated health outcomes. *Archives of Pediatric and Adolescent Medicine*, 157, 469–474.
- ^{143.} Malloy, M.H. (2002). Trends in postneonatal aspiration deaths and reclassification of sudden infant death syndrome: Impact of the "Back to Sleep" program. *Pediatrics*, 109(4), 661–665.
- ^{144.} Harper, R.M., Kinney, H.C., Fleming, P.J., & Thach, B.T. (2000). Sleep influences on homeostatic functions: Implications for sudden infant death syndrome. *Respiration Physiology*, 119, 123–132.
- ^{145.} Kahn, A., Groswasser, J., Franco, P., Scaillet, S., Sawaguchi, T., Kelmanson, I., & Dan, B. (2003). Sudden infant deaths: Stress, arousal, and SIDS. *Early Human Development*, 75(Suppl.), 147–166.
- ^{146.} Kahn, A., Groswasser, J., Franco, P., Scaillet, S., Sawaguchi, T., Kelmanson, I., & Dan, B. (2003). Sudden infant deaths: Stress, arousal, and SIDS. *Early Human Development*, 75(Suppl.), 147–166.
- ^{147.} Persing, J., James, H., Swanson, J., & Kattwinkel, J. (2003). American Academy of Pediatrics Committee on Practice and Ambulatory Medicine, Section on Plastic Surgery and Section on Neurological Surgery. Prevention and management of positional skull deformities in infants. *Pediatrics*, 112(1), 199–202.
- ^{148.} Hutchison, B.L., Hutchison, L.A.D., Thompson, J.M.D., & Mitchell, E.A. (2004). Plagiocephaly and brachycephaly in the first two years of life: A prospective cohort study. *Pediatrics*, 114, 970–980.
- ^{149.} Hutchison, B.L., Hutchison, L.A.D., Thompson, J.M.D., & Mitchell, E.A. (2004). Plagiocephaly and brachycephaly in the first two years of life: A prospective cohort study. *Pediatrics*, 114, 970–980.
- ^{150.} American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position. *Pediatrics*, 105(3), 650–656.
- ^{151.} Persing, J., James, H., Swanson, J., & Kattwinkel, J. (2003). American Academy of Pediatrics Committee on Practice and Ambulatory Medicine, Section on Plastic Surgery and Section on Neurological Surgery. Prevention and management of positional skull deformities in infants. *Pediatrics*, 112(1), 199–202.
- ^{152.} Willinger, M., Ko, C.W., Hoffman, H.J., Kessler, R.C., & Corwin, M.G. (2000). Factors associated with caregivers' choice of infant sleep position: The National Infant Sleep Position Study. *Journal of the American Medical Association*, 283, 2135–2142.
- ^{153.} Persing, J., James, H., Swanson, J., & Kattwinkel, J. (2003). American Academy of Pediatrics Committee on Practice and Ambulatory Medicine, Section on Plastic Surgery and Section on Neurological Surgery. Prevention and management of positional skull deformities in infants. *Pediatrics*, 112(1), 199–202.
- ^{154.} Roter, D., & Hall, J. (1989). Studies of doctor-patient interaction. *Annual Review of Public Health*, 10, 163–180.
- ^{155.} Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall, Inc.
- ^{156.} Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (2000). *Targeting sudden infant death syndrome (SIDS): A strategic plan*.
- ^{157.} Bullock, L.F., Mickey, K., Green, J., & Heine, A. (2004). Are nurses acting as role models for the prevention of SIDS? *The American Journal of Maternal Child Nursing*, 29(3), 172–177.
- ^{158.} Heiberger, G. (2004). Empowering parents for SIDS prevention: Nurse practitioners play key role. *Advance for Nurse Practitioners*, 12(5), 57–58.
- ^{159.} Brenner, R.A., Simons-Morton, B.G., & Bhaskar, B. (1998). Prevalence and predictors of the prone sleep position among inner-city infants. *Journal of the American Medical Association*, 280, 341–346.
- ^{160.} Lesko, S.M., Corwin, M.J., & Vezina, R.M. (1998). Changes in sleep position during infancy: A prospective longitudinal assessment. *Journal of the American Medical Association*, 280, 336–340.
- ^{161.} Li, D.K., Petitti, D.B., Willinger, M., McMahon, R., Odouli, R., Vu, H., & Hoffman, H.J. (2003). Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *American Journal of Epidemiology*, 157(5), 446–455.
- ^{162.} Heiberger, G. (2004). Empowering parents for SIDS prevention: Nurse practitioners play key role. *Advance for Nurse Practitioners*, 12(5), 57–58.
- ^{163.} Ariagno, R.L., Mirmiran, M., Adams, M., Saporito, A., Dubin, A., & Baldwin, R.B. (2003). Effect of position on sleep, heart rate variability, and QT interval in preterm infants at 1 and 3 months' corrected age. *Pediatrics*, 111(3), 622–625.
- ^{164.} Bhat, R., Hannam, S., Pressler, R., Rafferty, G., Peacock, J., & Greenough, A. (2006). Effect of prone and supine position on sleep, apneas, and arousal in preterm infants. *Pediatrics*, 118(1), 101–107.

For more information on SIDS and SIDS risk reduction, contact the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). The mission of the NICHD is to ensure that every person is born healthy and wanted, that women suffer no harmful effects from the reproductive process, and that all children have the chance to fulfill their potential for a healthy and productive life, free of disease or disability, and to ensure the health, well-being, independence, and productivity of all people through optimal rehabilitation. The NICHD supports and conducts research on topics related to SIDS and infant mortality, including maintaining the national *Back to Sleep* campaign to raise awareness about ways to reduce the risk of SIDS.

***Back to Sleep* Campaign**

Phone: 1-800-505-CRIB (2742)

Fax: 1-866-760-5947

Mail: 31 Center Drive, Building 31, Room 2A32, Bethesda MD 20892

Internet: <http://www.nichd.nih.gov/SIDS>

Continuing Education Program on SIDS *Risk* Reduction

The following post-test is designed to measure your knowledge of SIDS, SIDS risk-reduction recommendations, and how to communicate the recommendations to parents and caregivers. The questions cover the major content areas of the CE program you just completed. Some questions may have more than one correct answer. To receive CE credit, you must score 70 percent or better; that is 7 out of 10 questions must be answered correctly to receive CE credit.

The NICHD will notify you of test results within 8 weeks of receiving your post-test and evaluation form. Nurses with scores of 70 percent or higher will receive a certificate of completion; nurses with scores lower than 70 percent will be offered a second attempt to pass the test. If you have questions about this CE program, contact the NICHD at 1-800-370-2943 or at NICHDInformationResourceCenter@mail.nih.gov.

Instructions:

1. Complete the registration information.
2. Complete the post-test by checking the appropriate answer box for each question.
3. Sign and date the post-test.
4. Complete the program evaluation.
5. Return the post-test and program evaluation to:
Mail: P.O. Box 3006, Rockville, MD 20847
Secure fax: 1-866-760-5947

Name: _____

Title: _____

Affiliation: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Optional Items:

License Number: _____

Credential: _____

State(s): _____



To complete the post-test, check the appropriate answer box for each question. Then sign and date the bottom of the post-test and submit it to the NICHD for scoring. For complete submission instructions, please see Post-Test Page 1.

Test questions here.

1. SIDS is:

<input type="checkbox"/> A. The sudden and unexplained death of an infant younger than one year of age	<input type="checkbox"/> C. Determined only after an autopsy, an examination of the death scene, and a review of the infant's and family's clinical histories
<input type="checkbox"/> B. Caused by vomiting and/or choking	<input type="checkbox"/> D. Both A and C
2. The triple-risk model describes:

<input type="checkbox"/> A. The most dangerous environmental stressors associated with SIDS	<input type="checkbox"/> C. The genetic mutations linked to SIDS
<input type="checkbox"/> B. The convergence of three conditions that may lead to the death of an infant from SIDS	<input type="checkbox"/> D. The three most critical developmental periods associated with SIDS
3. Each of the following is a major modifiable factor that puts infants at higher risk of SIDS, except:

<input type="checkbox"/> A. Stomach sleeping for naps and at night	<input type="checkbox"/> C. Tummy Time
<input type="checkbox"/> B. Soft sleep surfaces and loose bedding	<input type="checkbox"/> D. Maternal smoking during pregnancy
4. Since 1992, SIDS rates in the United States have:

<input type="checkbox"/> A. Increased in all populations	<input type="checkbox"/> C. Increased among Hispanic infants, but declined in all other populations
<input type="checkbox"/> B. Remained constant	<input type="checkbox"/> D. Declined in all populations
5. SIDS rates remain disproportionately high in which of the following ethnic groups:

<input type="checkbox"/> A. Hispanics	<input type="checkbox"/> B. African Americans	<input type="checkbox"/> C. American Indians/Alaska Natives	<input type="checkbox"/> D. Both B and C
---------------------------------------	---	---	--
6. Which of the following constitutes a safe sleeping environment for an infant:

<input type="checkbox"/> A. A firm mattress with stuffed toys surrounding the perimeter	<input type="checkbox"/> C. A firm mattress, free of loose bedding and stuffed toys
<input type="checkbox"/> B. Soft sleep surfaces	<input type="checkbox"/> D. Loose bedding, such as quilts and comforters
7. Tummy Time is appropriate when:

<input type="checkbox"/> A. An infant is awake but drowsy	<input type="checkbox"/> C. An infant is asleep
<input type="checkbox"/> B. An infant is awake and supervised	<input type="checkbox"/> D. An infant is unsupervised
8. When nurses speak to parents and caregivers about SIDS, it is important that their messages:

<input type="checkbox"/> A. Be detailed	<input type="checkbox"/> C. Be clear and culturally appropriate
<input type="checkbox"/> B. Include statistics	<input type="checkbox"/> D. Include medical terminology
9. Among parents and caregivers, common reasons for not complying with SIDS risk-reduction recommendations include:

<input type="checkbox"/> A. Relatives recommend the prone position	<input type="checkbox"/> C. Fear of aspiration or choking
<input type="checkbox"/> B. Concern about flattened skull (positional plagiocephaly)	<input type="checkbox"/> D. All of the above
10. The appropriate time to deliver SIDS risk-reduction recommendations to parents is:

<input type="checkbox"/> A. Within the first 24 hours following delivery	<input type="checkbox"/> C. At well-baby visits
<input type="checkbox"/> B. During pregnancy	<input type="checkbox"/> D. All of the above

I certify that these answers were arrived at by me only and in accordance with the instructions contained herein. I also understand that this post-test will form part of my application for CE credit through the Maryland Nurses Association.

Signature: _____

Date: _____

Continuing Education Program on SIDS *Risk* Reduction

The following program evaluation is designed to measure the effectiveness of this CE program in meeting the learning objectives outlined in the Introduction.

Please complete this evaluation after reading the CE program and completing the post-test. Inclusion of your contact information on this form is optional. However, this evaluation form is part of your application for CE credit through the Maryland Nurses Association. Submit the post-test and this evaluation to NICHD at:

Mail: P.O. Box 3006, Rockville, MD 20847

Fax (secure): 1-866-760-5947

If you have questions about this CE program, call NICHD at 1-800-370-2943, or e-mail
NICHDInformationResourceCenter@mail.nih.gov.

Name: _____

Title: _____

Affiliation: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Instructions: On a scale of 1 to 5, with 5 being EXCELLENT and 1 being POOR, please rate the SIDS risk-reduction CE program.

	Poor	Weak	Good	Very Good	Excellent
1. Overall CE program	1	2	3	4	5
2. Clarity of the information	1	2	3	4	5
3. Logical organization of the CE program	1	2	3	4	5
4. Usefulness of the information	1	2	3	4	5

5. How much time did you require to complete this program, including the pre-test and post-test?
_____ hours

6. Which sections of the program were most beneficial? _____

7. Which sections of the program were least beneficial? _____

8. Is there additional information or another resource that would be helpful to you in communicating with parents and caregivers about SIDS risk reduction? _____



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

Eunice Kennedy Shriver National Institute of Child Health and Human Development

Please complete this program evaluation after reading the CE program and completing the post-test. Submit both pages of the program evaluation with your post-test to the NICHD. For complete submission instructions, please see Program Evaluation page 1.

Name: _____

Title: _____

Instructions: On a scale of 1 to 5, with 5 being EXCELLENT and 1 being POOR, please rate the SIDS risk-reduction CE program.

	Poor	Weak	Good	Very Good	Excellent
9. Defining SIDS (including its etiology, risk factors, and epidemiology)	1	2	3	4	5
10. Listing the critical SIDS risk-reduction messages for parents/caregivers	1	2	3	4	5
11. Describing your key role as an educator about SIDS for parents/caregivers	1	2	3	4	5
12. Listing the four barriers to back sleeping	1	2	3	4	5
13. Having objectives relate to the overall purpose/goal of the activity	1	2	3	4	5

RECOMMENDATIONS

Continuing Education Program on SIDS *Risk* Reduction

Share the information below with parents and caregivers to educate them on ways to reduce the risk of SIDS.

- **Always place the baby on his or her back to sleep for naps and at night.** The back sleep position is the safest, and every sleep time counts.
- **Place the baby to sleep on a firm sleep surface, such as on a safety-approved* crib mattress, covered by a fitted sheet.** Never place the baby to sleep on pillows, quilts, sheepskins, or other soft surfaces.
- **Keep soft objects, toys, and loose bedding out of the baby's sleep area.** Don't use pillows, blankets, quilts, sheepskins, or pillow-like crib bumpers in the baby's sleep area, and keep all items away from the baby's face. If you choose to use a blanket, place the baby with his or her feet at the end of the crib. The blanket should reach no higher than the baby's chest. Tuck the ends of the blanket under the crib mattress to ensure safety.
- **Do not allow smoking around the baby.** Don't smoke before or after the birth of the baby, and don't let others smoke around the baby.
- **Keep the baby's sleep area close to but separate from where you and others sleep.** The baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you. If you bring the baby into bed with you to breastfeed, put him or her back in a separate sleep area, such as a bassinet, crib, cradle, or a bedside co-sleeper (an infant bed that attaches to an adult bed) when finished.
- **Think about using a clean, dry pacifier when placing the baby down to sleep,** but don't force the baby to take it. If breastfeeding, wait until the baby is one month of age or is used to breastfeeding before using a pacifier.
- **Do not let the baby overheat during sleep.** Dress the baby in light sleep clothing and keep the room at a temperature that is comfortable for an adult.
- **Avoid products that claim to reduce the risk of SIDS** because most have not been tested for effectiveness or safety.
- **Do not use home monitors to reduce the risk of SIDS.** If you have questions about using monitors for other conditions, talk to your health care provider.
- **Reduce the chance that flat spots will develop on the baby's head.** Provide Tummy Time when the baby is awake and someone is watching; hold the baby upright when he or she is not sleeping; change the direction that the baby lies in the crib from one week to the next; and avoid too much time in car seats, carriers, and bouncy seats.

Share these messages with parents, child care providers, grandparents, babysitters, and everyone who cares for the baby.

* U.S. Consumer Product Safety Commission *Crib Safety Tips*: <http://www.cpsc.gov/cpscpub/pubs/cribsafe.html>

Sources: Eunice Kennedy Shriver National Institute of Child Health and Human Development. (2005). *Safe Sleep for Your Baby: Reduce the Risk of Sudden Infant Death Syndrome (SIDS)*. NIH Pub No. 05-7040; and Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116, 1245–1255.



December 2006
NIH Publication No. 06-6005

SIDS

by Baby's Age

Sudden infant death syndrome (SIDS) is the leading cause of death in infants between 1 month and 1 year of age. SIDS is also the third-leading cause of death for infants up to 1 year of age.

More than **90% of SIDS deaths** occur before babies reach **6 months** of age.

Age by Month



Even though SIDS can occur anytime during a baby's first year, **most SIDS deaths** occur in babies between **1 and 4 months** of age.

SIDS is less common after 8 months of age, but parents and caregivers should continue to follow safe-sleep practices to reduce the risk of SIDS and other sleep-related causes of infant death until baby's first birthday.

More than
90%
of all SIDS deaths occur
before **6 months**
of age

72%
of SIDS deaths occur in
Months 1–4

Source: Technical Report of the American Academy of Pediatrics
Task Force on Sudden Infant Death Syndrome

To reduce the risk of SIDS and other sleep-related causes of infant death:

- ▶ Always place baby on his or her back to sleep for all sleep times, including naps.
- ▶ Room share—keep baby's sleep area in the *same* room next to where you sleep.
- ▶ Use a firm sleep surface, free from soft objects, toys, blankets, and crib bumpers.



20th
Anniversary
SAFE TO SLEEP[®]

Learn more about ways to reduce the risk of SIDS and other sleep-related causes of infant death at
<http://safetosleep.nichd.nih.gov>



Eunice Kennedy Shriver National Institute
of Child Health and Human Development

Create a **Safe Sleep** Environment for Baby

Did you know that the features of your baby's sleep area can affect his/her risk for **Sudden Infant Death Syndrome (SIDS)** and other sleep-related causes of infant death, such as suffocation?

Reduce the risk of SIDS and other sleep-related causes of infant death by **creating a safe sleep environment** for your baby.

How can you make a **safe sleep environment**?



- ▶ Always place baby **on his or her back** to sleep for all sleep times, including naps.



- ▶ Have the baby **share your room, not your bed**. Your baby should not sleep in an adult bed, on a couch, or on a chair alone, with you, or with anyone else. Try room sharing—keeping baby's sleep area in the *same* room next to where you sleep.



- ▶ Use a **firm sleep surface**, such as a mattress in a safety-approved* crib, covered by a fitted sheet.



- ▶ Keep soft objects, toys, pillows, crib bumpers, and loose bedding **out of your baby's sleep area**.



- ▶ Dress your baby in **no more than one layer of clothing more than an adult would wear** to be comfortable, and leave the blanket out of the crib. A one-piece sleeper or wearable blanket can be used for sleep clothing. Keep the room at a temperature that is comfortable for an adult.

Safety-approved* portable play yards can also provide a safe sleep environment for your baby. When using a portable play yard, always place baby to sleep on his or her back and keep toys, pillows, and blankets out of the play yard. These actions help reduce the risk of SIDS and other sleep-related causes of infant death.

***Visit** the U.S. Consumer Product Safety Commission website for more information about safety-approved baby sleep areas: <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/>



Eunice Kennedy Shriver National Institute of Child Health and Human Development



Learn more about ways to reduce the risk of SIDS and other sleep-related causes of infant death at

<http://safetosleep.nichd.nih.gov>

What is Safe Sleep for Babies?

[an educational flip chart]

DEVELOPED BY:
GEORGIA DEPARTMENT OF PUBLIC HEALTH
INJURY PREVENTION PROGRAM



EDUCATOR NOTE: The ABCs of Safe Sleep. The word “alone” when referring to an infant can be scary to parents. What it really means in this context is separate but close to the caregiver – not by themselves in another room.

Following these three suggestions decreases the risk of SIDS by as much as **50%**.

- **Alone** — Room sharing not bed sharing. Set up the infant’s safe sleeping area in the same room with you. This is especially important in the very early months when the risk of SIDS and SUID is greater.
- **Back** — Babies sleep safest on their backs. Every sleep. Every nap.
- **Crib** — Babies need a firm mattress with a tight fitting bottom sheet, made specifically for the crib. No blankets, quilts, crib bumpers or toys.

The ABC’s of Safe Sleep

[**A**lone, **B**ack, **C**rib]

A. Alone – Babies need their own sleep space.

B. Back – Babies sleep safest on their backs. Every sleep. Every nap. Every time.

C. Crib – Babies without blankets, quilts, crib bumpers or toys.



We Protect Lives.

We Protect Lives.

The ABC's of Safe Sleep

[**A**lone, **B**ack, **C**rib]

A. Alone – Babies need their own sleep space.

B. Back – Babies sleep safest on their backs. Every sleep. Every nap. Every time.

C. Crib – Babies need a firm mattress with a tight fitting bottom sheet, made specifically for the crib. No blankets, quilts, crib bumpers or toys.



We Protect Lives.

EDUCATOR NOTE: This is an example of a safe sleep environment. If your baby can roll over front to back and back to front, you do not need to reposition the baby if he/she turns over while sleeping.

Ask the parent: What makes this a safe sleep environment?

A. The baby is **alone**.

There are no crib bumpers, blankets, toys, or siblings.

B. The baby is on his **back**.

Sleeping on the stomach doubles the risk of sleep related infant death.

C. The **crib** mattress is firm.

There is nothing that poses a risk of suffocation or strangulation.



We Protect Lives.

We Protect Lives.



We Protect Lives.

EDUCATOR NOTE: Room sharing is the safest sleeping arrangement for the baby and parent or caregiver. Many parents find having the baby nearby in the same room throughout the night helps them sleep better since they don't have to worry about the baby being too hot or too cold or waking up.

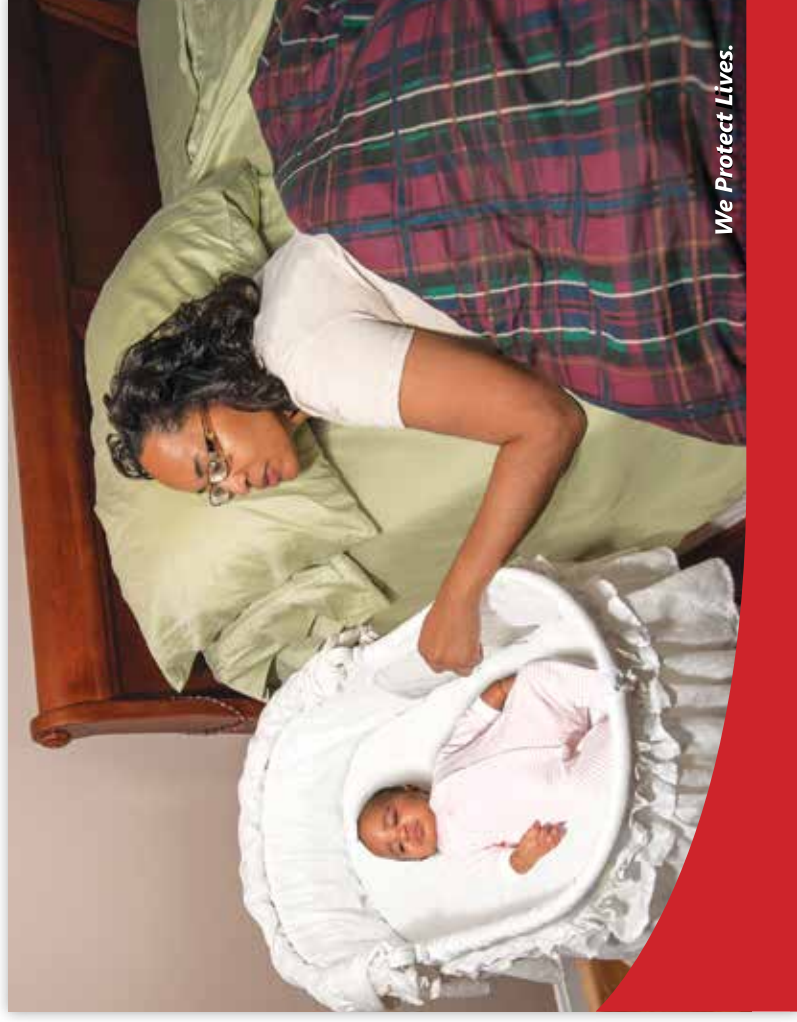
What is Room Sharing?

What is room sharing?

- A sleep arrangement in which an infant sleeps in the same room as parents or other adults, but on a separate sleep surface, such as a crib, bassinet, or play yard.

Why room share instead of bed share?

- Room sharing does not have the risk of suffocation and entrapment that is associated with bed sharing.
- Room sharing is breastfeeding-friendly because the baby is nearby and the mother doesn't have to leave the room.
- Room sharing allows for easy monitoring and soothing during nighttime fussiness.
- Room sharing is especially important during an infant's first six months when the risk of SIDS or SUID is greatest or if the baby is pre-term or low birth weight.
- Room sharing is critically important if the parent or caregiver smokes, uses medication, is overly fatigued or if they have a soft bed.



We Protect Lives.



We Protect Lives.

EDUCATOR NOTE: We know that some things can increase a baby's risk for SIDS and SUID and other sleep-related causes of infant death. Each picture below shows different risks for suffocation, entrapment, and overlay.

Ask the parent – What do you see as risks in each of these pictures?

(TOP LEFT) Crib has many suffocation risks including blankets, crib bumpers, toys. Crib should be bare – nothing but baby in the crib. Baby is on her stomach with a fluffy blanket and pillow by her face. Babies cannot lift things away from their face and don't notice when their intake of oxygen is being restricted, leading to suffocation.

(TOP RIGHT) Babies easily fall asleep lying on someone. It is especially dangerous if the person holding the baby falls asleep because the baby can slip off and become trapped between the person and the sleeping surface (couch, chair, headboard, etc.).

(BOTTOM LEFT) Baby is placed between two people. This type of bed sharing increases the risk of suffocation if someone, even another child, rolls over on the baby. The baby cannot warn you that he is in danger and slowly suffocating.

(BOTTOM RIGHT) Baby is sleeping on his stomach with a blanket and toys in the crib.



We Protect Lives.

We Protect Lives.



Unsafe and Potentially Deadly



Sleep Environments

We Protect Lives.

EDUCATOR NOTE: Please be aware that all “drop down” cribs (where the side slides up and down for easier access to the baby) are considered unsafe and no longer for sale. If a family has one, advise them to consider a different model. Additionally, the slats on a crib should be no wider than the bottom of a soda can – this helps to keep little legs and arms (and head) from getting stuck. Please check www.cpsc.gov to make sure your crib is not recalled.

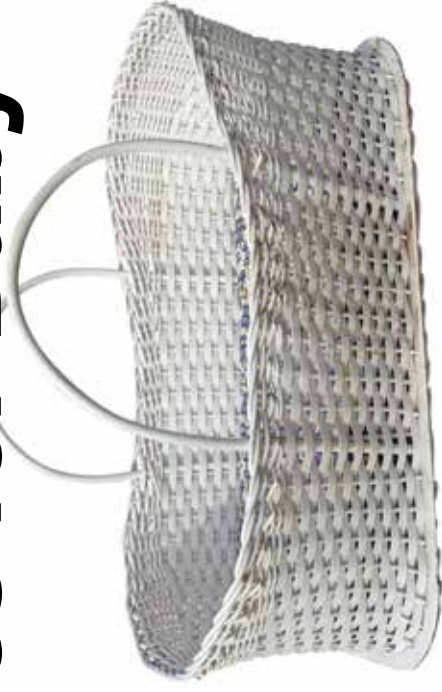
Ask the parent – What makes these sleep places safer for babies?

- They have firm mattresses.
- There are no blankets or pillows.
- There are no toys or crib bumpers.



We Protect Lives.

Safe Sleeping Places for Baby



We Protect Lives.

EDUCATOR NOTE: Creating the safest possible sleep environment for baby is key to reducing the risk of sleep related infant death.

Ask the parent – On the last page we looked at safe places for babies to sleep. Now we're looking at **unsafe** places – what makes these unsafe places for babies to sleep?

- Surfaces are not considered firm.
- Pillows and cushions can lead to suffocation.
- Babies can get trapped between the cushions and the back and sides of a chair or couch.
- Air mattresses and bean bags are not firm surfaces and should never be used with a baby.
- Babies sleeping in car seats and bouncy chairs tend to slide down in them, which can restrict their breathing and lead to suffocation.

Unsafe Sleeping Places for Baby



We Protect Lives.

Unsafe Sleeping Places for Baby



We Protect Lives.

EDUCATOR NOTE: There are other things to consider when creating a safe sleep environment for your baby.

- **Avoid overheating** – Dress your baby in only one more layer of clothing than what you are comfortable wearing.
- **Sleep Sack** – Consider a “wearable blanket” or one-piece sleeper instead of using quilts or blankets.
- **Space Heaters** – Keep baby at least 4 feet from all heaters (electric space heaters, kerosene heaters, etc.)
- **Smoke Exposure** – To reduce the risk of SIDS, do not smoke during pregnancy or after your baby is born. Don’t allow others to smoke around your baby.
- **Drugs and Alcohol** – If you or another caregiver is under the influence of drugs or alcohol, your baby must have a separate sleep area.

Some Other Things to Consider...



We Protect Lives.

We Protect Lives.

Some Other Things to Consider...



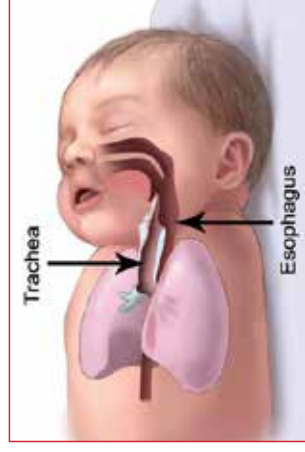
We Protect Lives.

EDUCATOR NOTE: A leading reason for parents and caregivers putting babies to sleep on their stomachs is concern about choking and reflux. Research shows no increased incidence of aspiration since the change to back sleeping. This is important to understand and will help you when you address parental worry about back sleeping.

- When a baby is **lying on his back** the airway, or trachea, is on top of the esophagus. Healthy babies tend to swallow or cough up fluids when lying on their back without anything getting into the airway causing them to choke.
- When a baby is **lying on his stomach**, any food or fluids thrown up or refluxed will pool at the opening of the airway.
- If your baby has a **medical condition** such as reflux, you should talk to your pediatrician about the best sleep position for your baby.

Choking Concerns

Upper Respiratory Anatomy



Less Risk of Choking

Gravity helps keep food and liquid out of trachea (airway).



Greater Risk of Choking

Gravity draws food and liquid into the trachea (airway).

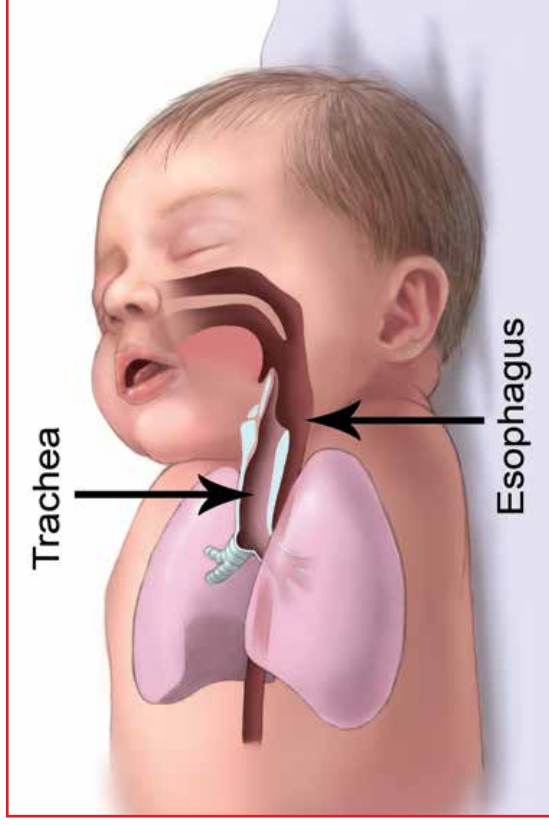
We Protect Lives.

We Protect Lives.

Choking

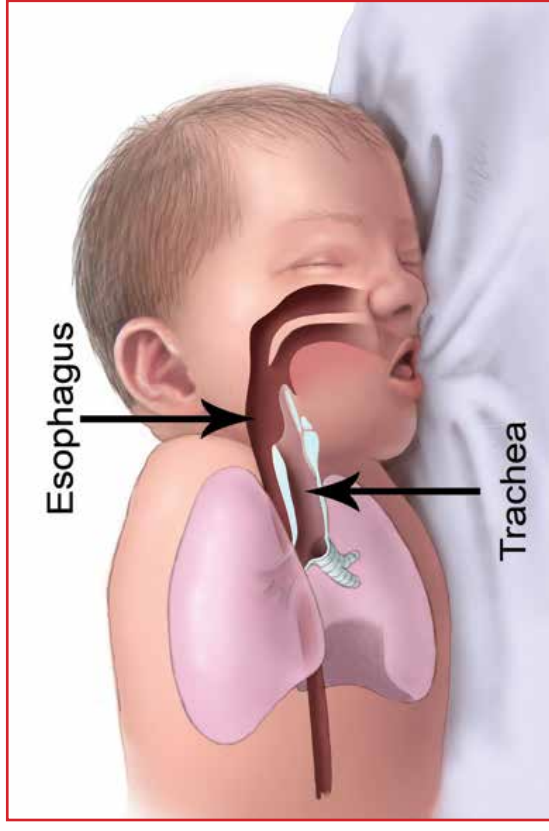
Upper Respiratory Anatomy

Trachea = Airway • Esophagus = Goes to Stomach



Less Risk of Choking

Gravity helps keep food and liquid out of trachea (airway).



Greater Risk of Choking

Gravity draws food and liquid into the trachea (airway).

We Protect Lives.

EDUCATOR NOTE: Many parents feel that bed sharing with their infant is a way to bond with their baby, especially if they are away from the child for long periods. But there are other safe, effective ways to bond with their baby.

Ask the parent –

Can you think of ways to bond with your baby that don't involve bed sharing?

Safe ways to bond are:

- Breastfeeding,
- Reading, singing, talking to your baby,
- Holding and snuggling and engaging in eye to eye contact are a few.
- Babies prefer human voices and enjoy vocalizing in their first efforts at communication. Babies often enjoy just listening to your conversations, as well as your descriptions of their activities and environments.
- Giving your baby a bath.
- Supervised Tummy Time

Safe and Effective Ways to Bond

- **Breastfeed your baby** (protects against SIDS, too)
- **Read, sing, or talk** to your baby
- **Hold and snuggle** your baby while awake
- **Supervised tummy time**
- **Engage in eye contact**



We Protect Lives.

We Protect Lives.

Safe and Effective Ways to Bond

- **Breastfeed your baby** (protects against SIDS, too)
- **Read, sing, or talk** to your baby
- **Hold and snuggle** your baby while awake
- **Supervised tummy time**
- **Engage in eye contact**



We Protect Lives.

Additional Resources

- **Georgia Department of Public Health** dph.ga.gov/safetosleep
- **Centers for Disease Control and Prevention Safe Sleep Information**
cdc.gov/sids
- **First Candle** (prevention and bereavement resources)
firstcandle.org
- **American Academy of Pediatrics**
healthychildcare.org
- **Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)** – Safe to Sleep Campaign
safetosleep.nichd.nih.gov; dph.ga.gov/safetosleep

A photograph of a man and a woman leaning over a white crib, looking at a baby lying inside. The woman is wearing a white lace top and the man is wearing a dark t-shirt. The baby is wearing a grey onesie with purple polka dots. The crib has a pink sheet. The background is a plain white wall and a wooden floor.

Any Questions or Concerns?

We Protect Lives.

A Brief History of the

Safe to Sleep Recommendations

- In 1992, the American Academy of Pediatrics (AAP) issued its first recommendation on infant sleep which was to place infants on their back (supine) or on their side. Until this time, there was no consistent recommendation rooted in science and based upon research.
- In 1994 the National Institute on Child Health and Development launched the “Back to Sleep” Campaign. This campaign was very successful and resulted in a large number of children being placed either on their back or side for sleep. The result was a dramatic drop in SIDS (Sudden Infant Death Syndrome) related deaths.
- In 2005, the AAP changed its recommendation from supine or side, to supine only. It eliminated any recommendation of side sleeping for healthy infants.
- In 2011, the AAP further expanded their recommendations on infant safe sleep to include the sleep environment because unfortunately, at the same time that SIDS rates were declining it was discovered that SUID (Sudden Unexpected Infant Death) rates were increasing. Many past SIDS cases are now believed to have been SUID. SUID cases often involve unsafe sleeping environments and one or more risk factors for SIDS; therefore, infant safe

sleep must incorporate not only the sleep position but also the sleep location and environment.

- The new AAP recommendations were split into 3 levels based on scientific rigor:

Level A: Recommendations are based on good and consistent scientific evidence (i.e., there are consistent findings from at least 2 well-designed, well-conducted case-control studies, a systematic review, or a meta-analysis). There is high certainty that the net benefit is substantial, and the conclusion is unlikely to be strongly affected by the results of future studies.

Level B: Recommendations are based on limited or inconsistent scientific evidence. The available evidence is sufficient to determine the effects of the recommendations on health outcomes, but confidence in the estimate is constrained by such factors as the number, size, or quality of individual studies or inconsistent findings across individual studies. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Level C: Recommendations are based primarily on consensus and expert opinion. (AAP, 2011)

Level A recommendations:

- Back to sleep for every sleep
- Use a firm sleep surface
- Room-sharing without bed-sharing is recommended
- Keep soft objects and loose bedding out of the crib
- Pregnant women should receive regular prenatal care
- Avoid smoke exposure during pregnancy and after birth
- Avoid alcohol and illicit drug use during pregnancy and after birth
- Breastfeeding is recommended
- Consider offering a pacifier at nap time and bedtime
- Avoid overheating
- Do not use home cardiorespiratory monitors as a strategy for reducing the risk of SIDS
- Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep related infant deaths, including SIDS, suffocation, and other accidental deaths; pediatricians, family physicians, and other primary care providers should actively participate in this campaign.

We Protect Lives.

Level B recommendations:

- Infants should be immunized in accordance with recommendations of the AAP and Centers for Disease Control and Prevention
- Avoid commercial devices marketed to reduce the risk of SIDS
- Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly

Level C recommendations:

- Health care professionals, staff in newborn nurseries and NICUs, and child care providers should endorse the SIDS risk-reduction recommendations from birth.
- Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising.
- Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely.
- To access the full article, visit: www.pediatrics.org/cgi/doi/10.1542/peds.2011-2284

Common issues and concerns you may encounter when discussing Safe to Sleep recommendations:

Previously, education on Safe to Sleep recommendations has mostly revolved around telling a parent or caregiver what they should and should not do when laying their infant to sleep. Research has shown that although this tactic may work for some, it isn't as effective of a method that could be employed. Current suggestions involve explaining "why" the recommendations are being made and having more of a conversation with the caregiver around the recommendations. Therefore, we are focusing on explaining the risks of suffocation, strangulation, and entrapment and we are also explaining that choking and comfort do not need to be concerns. Adoption of the recommendations, which will help to reduce infant death, will be more likely if the concerns of parents and caregivers are addressed. Below are some sample questions and answers.

Common concerns

with the ABC's of Safe Sleep (A – alone, B – on his or her back and, C – in a crib)

Q: What if my baby spits up? Will she choke while on her back?

A: Very good question and one of much concern for new parents. Many people define choking as; coughing, spitting, or sputtering. This is not

choking however, and is actually what the baby does to avoid choking. It would seem to make sense that a child will choke if on his or her back however; our bodies are designed in such a manner that the windpipe is protected while a child is lying on her back. Therefore, a child has less risk of choking when laying on his or her back.

Q: Do babies that sleep on their backs get flat spots on their heads?

A: Babies CAN get flat spots on their heads (called plagiocephaly) but they don't HAVE to get flat heads. Plagiocephaly is most common in babies who are less than five months old. That's because the bones in babies' skulls are soft and movable when they are born. Here are some steps to help avoid issues with "flat head":
1) limit the time your baby is left in a car seat (for instance not while napping, car seats should only be used for travel) **2)** switch which end of the crib your baby sleeps at each night to change the things baby is looking at and encourage him to turn his head **3)** carry your baby on alternate shoulders or hips, and make sure your baby's head isn't always in the same feeding position and, **4)** around 3 months of age, encourage supervised tummy time to help strengthen his back and stomach muscles. By 4 to 6 months your baby will be laying fully on his back less often and will be able to be propped up and this will take the pressure off of the back of his skull.

We Protect Lives.

Q: My Mom put be on my stomach when I was young, I turned out fine, why is it so important for me to put my child on her back to sleep?

A: This is a very common question, especially because the advice years ago used to be to lay babies on their bellies for sleep. The advice for stomach sleeping wasn't rooted in science. The recommendation for back sleeping is supported by research and we know it is safer for a baby to be on her back. We also know that SIDS deaths have dropped by 50% since we started placing babies on their backs for sleep. That's a lot of babies that are surviving. Now recommendations have been expanded to help give our babies safe sleep environments, so we can eliminate sleep related deaths for all babies and their families.

Q: My baby doesn't seem comfortable on his back and seems to wake more often. Shouldn't I be concerned for his comfort?

A: Babies do tend to rouse (wake up) more often when on their backs however, the fact that babies rouse more often is actually believed to be a protective factor against SIDS. This means that instead of "forgetting" to breathe because they are so soundly asleep, a baby on his back will rouse more often and ensure that his underdeveloped respiratory system keeps working correctly.

Q: Why would I want to put my baby all alone in a crib by herself? That seems more dangerous to me.

A: Just because it is recommended that your baby is alone in her crib, doesn't mean she needs to be left all alone and by herself! To clarify, she should be alone in her crib without other children and items like blankets and toys but, she should still be close to you. We call this "room-sharing" without "bed-sharing". Room-sharing is shown to be protective of your baby, especially when they are very young. As your child gets older you can decide when the right time is to move him or her into their own room. Until then, keep them close, but keep them safe in their own space too.

Q: My doctor, a nurse, and my Mom all gave me different information...who should I listen to about sleep safety?

A: Gather as much information as you can and follow your instincts...even advocates for bed-sharing acknowledge that there are clearly defined steps you should take to reduce your child's risk of sleep related death. These steps align with the advice posted here and are positive healthy ways to ensure your child's wellbeing. Certain medical conditions may require you to follow different advice than what is here, always take into account special circumstances when deciding what is best for you and your family.

Q: Why is smoking bad for my baby and his sleep?

A: Tobacco smoke is damaging to everyone's lungs, especially the undeveloped, new to the world, lungs of an infant. Tobacco usage by mothers, or others in the home, while pregnant and after birth, has been linked to an increased risk for SIDS. Additionally, you want to avoid all drugs and alcohol when you are nursing your baby or in charge of caring for him.

Q: I'm worried about my baby being cold and getting sick. Why do they suggest no extra blankets in his crib?

A: Most babies only need about 1 layer more than what you, the adult, are wearing. Very young babies are still learning how to regulate their body temperatures and overheating them is dangerous therefore, adding an additional layer is sufficient for keeping them warm without being too hot. For example, if you are at home wearing a short sleeve t-shirt and jeans, your baby will be fine in a long sleeved sleeper. No extra blankets and quilts needed. Some people even dress their babies in a special "sleep sack". Additionally, extra blankets and quilts pose a very serious risk for suffocation. Keeping extra items such as this out of the crib, eliminates the risk.

We Protect Lives.

Background information for the educator.

- As of 2013, Georgia averaged **three infant deaths per week** due to sleep-related causes.
The majority of infant deaths are due to Sudden Unexpected Infant Death (SUID).
- SUID is the death of an infant younger than 1 year of age that occurs suddenly and unexpectedly. After a full investigation, these deaths may be diagnosed as suffocation, strangulation, entrapment, undetermined causes, and SIDS.
- SIDS is the sudden death of an infant younger than 1 year of age that cannot be explained even after a full investigation that includes a complete autopsy, examination of the death scene, and review of the clinical history. Not all infant sleep-related deaths are SIDS. SIDS deaths are rare and unpreventable, but steps can be taken to reduce the risk of SIDS. Other SUIDs are completely preventable. Referring to all deaths as SIDS undermines efforts to educate parents and caregivers on how to reduce the risk of sleep-related infant deaths.
- There are two main types of co-sleeping; room sharing and bed sharing. In accordance with the American Academy of Pediatrics (AAP), DPH promotes room sharing – a separate sleep space in the same room as the parent or caregiver. The baby is nearby and can be seen and heard. Room sharing helps promote breastfeeding and is associated with reduced risk of sleep-related death.
- This flipchart is intended to help parents and caregivers consciously and critically review their infant's sleep environment and best protect them from sleep-related death.
- As the educator, you can empower parents and caregivers with the knowledge they can protect their infant from suffocation, strangulation, entrapment, and other risks.

Safe to Sleep Campaign

www.dph.ga.gov/safetosleep



DEVELOPED BY:
GEORGIA DEPARTMENT OF PUBLIC HEALTH
INJURY PREVENTION PROGRAM



Safe Sleep Tips

A crib is the most important safety equipment that parents use with their new baby. It is the one place where children are left without supervision for hours at a time. Since 2007, over 12 million cribs have been recalled for faulty drop sides, mattress support, and other hazards. **Use the following guidelines to protect children** from dangerous sleeping environments.

What is a safe sleep environment? A safe sleep environment is a crib, bassinet, portable crib, or play yard that meets CPSC and ASTM standards. Cribs sold after June 28, 2011 now meet the *world's strongest testing standard*, and play yards made after February 28, 2013 have stronger than ever testing standards. The crib should include a tightly fitted sheet and the baby should be placed on its back -- **nothing else should be in the crib**. Never add extra padding under the baby.



Crib Safety Checklist:

1. Hardware is secure with no loose or missing parts.
2. Dress a baby in footed pajamas or wearable blankets to stay warm.
3. Mattress fits tight. 2 fingers cannot fit between the mattress and crib side.
4. Use only a tight fitting sheet that won't come loose.

To keep baby safe from SIDS and suffocation, keep all items out of the crib including:



Toys



Heavy blankets



Pillows



Sleep positioners



Crib bumper pads

Stay informed about safe sleep and other product safety issues by signing up for safety alerts at www.KidsInDanger.org.
Check cribs for recalls and get direct notification of recalls at www.cpsc.gov.

Submit and view reports of unsafe children's products at www.SaferProducts.gov.

Consejos para Dormir con Seguridad

La cuna es el equipo de seguridad más importante que los padres pueden obtener para su nuevo bebé. Es el lugar donde los niños se quedan sin supervisión durante horas. Desde el año 2007, más de 12 millones de cunas han sido reclamadas por barandales defectuosos, soportes de colchón, y otros peligros. **Utilice las siguientes directrices para proteger a los niños** de un ambiente peligroso para dormir.

¿Qué es un ambiente seguro para dormir? Un ambiente seguro para dormir es una cuna, moisés, cuna portátil o corralito que cumpla con los estándares del CPSC y ASTM. Las cunas vendidas después del 28 de Junio del 2011 cumplen con las normas de seguridad más rigurosas del mundo y los corralitos hechos después del 28 de Febrero del 2013 tienen estándares de pruebas más fuertes. La cuna debe incluir una sábana bien ajustada y el bebé debe estar colocado sobre su espalda – ninguna otra cosa **debe estar en la cuna**. Nunca añadas cobijas, almohadas, etc. adicionales debajo del bebé.



Lista de Seguridad para Cunas:

1. El hardware es seguro, sin piezas sueltas o perdidas.
2. Vista al bebé con pijamas hasta los pies o mantas portátiles para mantenerlo caliente.
3. El colchón tiene que estar bien ajustado. El espacio entre el colchón y la cuna no es más de 2 dedos.
4. Utilice solo una sábana bien ajustada que no se suelte ni tenga arrugas.

Para mantener al bebé a salvo del síndrome de muerte súbita infantil (SMSI) y asfixia, mantenga todos los artículos fuera de la cuna incluyendo:



Juguetes



Mantas pesadas



Cojines



Posicionadores de sueño



Protectores para la cuna

Manténgase informado sobre como dormir seguro y la seguridad de otros productos, inscribiéndose para recibir alertas en www.KidsInDanger.org. Revise las cunas en proceso de reclamo y recibe notificaciones directas de reclamaciones en www.cpsc.gov.

Envíe y revise informes sobre productos peligrosos para niños en www.SaferProducts.gov.

Síguenos en Internet:



Facebook.com/kidsindanger



Twitter.com/kidsindanger



Youtube.com/kidsindanger

116 W. Illinois., Suite 4E, Chicago, IL 60654 | (312) 595-0649 | www.KidsInDange

3 KEY WAYS **DADS** CAN HELP BABY Sleep Safe



Dads today spend triple the time caring for their children as dads did 50 years ago.

Making sure dads with infants know how to reduce the risk of **Sudden Infant Death Syndrome (SIDS)** and other sleep-related causes of infant death is more important than ever.

Dads everywhere can keep baby safe during sleep in the following ways.

1

Always place your baby on his or her back for sleep—both for naps and at night.

This is the most effective way to protect a sleeping baby from SIDS and other sleep-related causes of death.

Babies are not more likely to choke if placed on their backs to sleep, even if they throw up or drool while sleeping.

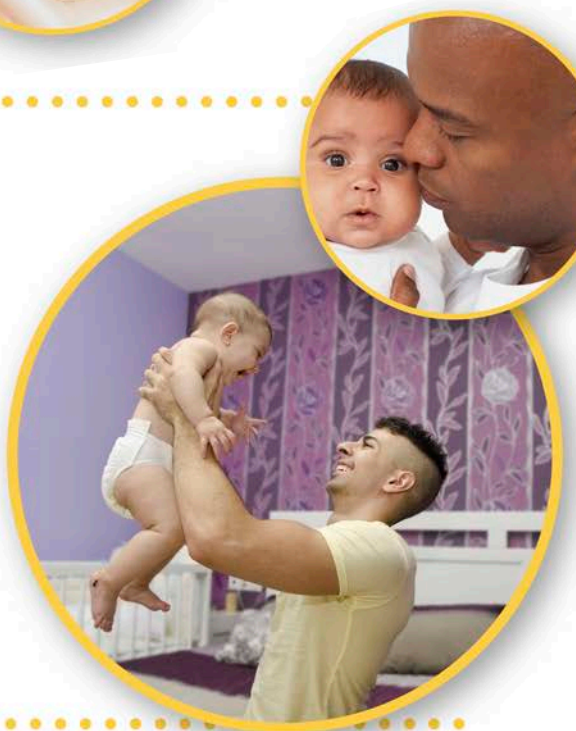


2

Share your room, not your bed.

Your baby should sleep in your room, but in his or her own separate sleep area. Baby should not sleep in an adult bed, on a couch, or in a chair alone, with you, or with anyone else.

Room sharing without bed sharing may reduce the risk of SIDS by as much as 50% and helps prevent accidental suffocation.



3

Use a firm sleep surface—such as a mattress in a safety-approved crib—covered by a fitted sheet.*

Remove all bumpers, blankets, loose bedding, and soft toys from the sleep area.

Do not use car seats, strollers, baby carriers, swings, and other sitting devices as baby's routine sleep area.



Learn more about what dads can do to create a safe sleep environment for babies at <http://safetosleep.nichd.nih.gov>.

*For information about crib safety, visit:

<http://www.cpsc.gov/Safety-Education/Safety-Education-Centers/cribs/>

20th
Anniversary
SAFE TO SLEEP



Eunice Kennedy Shriver National Institute of Child Health and Human Development



Safe Sleep

for Your Baby

About **3,400 infants die** suddenly and unexpectedly each year in the United States.** Most of these deaths result from **Sudden Infant Death Syndrome (SIDS)** and other sleep-related causes of infant death, such as suffocation.



Safe Sleep

to

formerly the Back to Sleep campaign

Safe to Sleep mission:

to educate parents, caregivers, and health care providers about ways to reduce the risk of SIDS and other sleep-related causes of infant death

1993

The proportion of **infants placed on their back** to sleep increased from **17%** to **73%***

17%

2010

73%

SIDS

50%

Number of **SIDS deaths**

4,669

1,910

The U.S. **SIDS rate dropped** by more than **50%** since 1993**



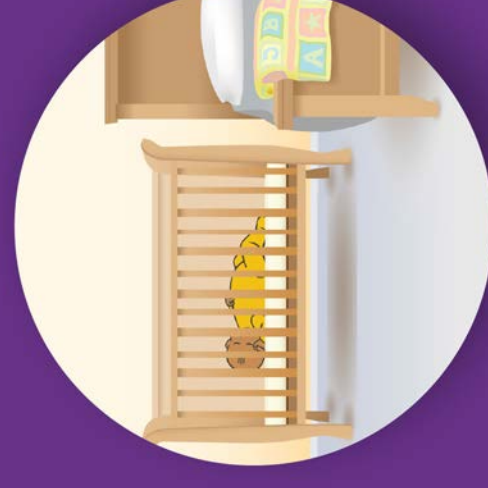
Safe Sleep

environment

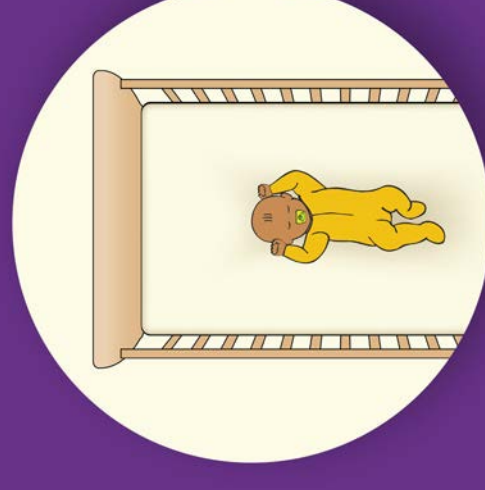
To **reduce the risk** of SIDS and other sleep-related causes of infant death:



- ▶ Always place baby on his or her back to sleep for all sleep times, including naps.



- ▶ Room share—keep baby's sleep area in the *same* room next to where you sleep.



- ▶ Use a firm sleep surface, free from soft objects, toys, blankets, and crib bumpers.



Learn more about ways to reduce the risk of SIDS and other sleep-related causes of infant death at

<http://safetosleep.nichd.nih.gov>



Eunice Kennedy Shriver National Institute of Child Health and Human Development

*NICHD National Infant Sleep Position Study
**Centers for Disease Control and Prevention

Safe to Sleep Education Acknowledgement Form

Instructions: Complete one form for each infant. Provide parent(s) with information about safe infant sleep and SIDS/SUID prevention. Request that the parent(s) voluntarily sign this form indicating that they have received the information. Provide them with one copy of the signed form and retain a copy in the infant's medical record.

NAME OF HOSPITAL: _____

Parent Name: _____ Age of Child: (if applicable) _____

Year of Parent's Birth: (voluntary) _____ County of Residence: _____

Parent(s) provided information of SIDS/SUID and safe infant sleep on: _____
mm/dd/yyyy

Parent: I have received information about the **ABC's of infant safe sleep** and understand that:

- My baby should sleep **Alone** in his or her own sleep space, free from toys, blankets, siblings and other items that could pose a risk for suffocation.
- My baby needs to sleep on his or her **Back** because side or tummy sleeping is dangerous.
- My baby should sleep in a **Crib** and have his or her own sleep space, free from toys, blankets, siblings and other items that could pose a risk for suffocation.
- Room sharing is safer for my baby and is recommended instead of bed sharing.
- Tobacco smoke is dangerous for my baby.
- Breastfeeding is recommended to reduce the risk of SIDS.
- My baby does not need lots of extra blankets and clothes and I should avoid overheating him or her.
- I received education on how to properly set up and use the provided Graco Pack 'N Play with Bassinet.
- I know to teach anyone who takes care of my baby about keeping him/her safe when sleeping.

Signature, Caregiver/Mother: _____ Date: _____

Signature, Caregiver/Father: _____ Date: _____

Signature, Education Provider: _____ Date: _____
mm/dd/yyyy

Our Babies:
safe&sound
.....

Say **Yes** to Safe Sleep Pledge

My Say **Yes** to Safe Sleep Pledge to: _____

Name of baby

I love you and promise to:

- Make sure that you always sleep alone, and on your back, in your crib or bassinet, even during naptimes.
- Check to make sure your crib is safety approved, and the mattress is firm and fits close to the sides of the crib or bassinet.
- Remove toys, heavy blankets, comforters and bumper pads from your crib, bassinet or pack and play.
- Keep you away from places where people smoke.
- Teach anyone who takes care of you about keeping you safe when you sleep.

Signature: _____ Date _____

Signature: _____ Date _____

SafeSoundBabies.com





Safe to Sleep Program Audit Tool

1. Has an Infant Safe to Sleep Policy/Guidelines been established and implemented?
Yes No
2. Have the requirements for Staff training been met?
Yes No
3. Are the requirements for Patient education being met?
Yes No
4. Is room sharing without bed sharing being enforced by staff?
Yes No
5. Are take home Safe to Sleep educational materials being provided to the parent?
Yes No
6. Have Crib Audit results been tallied?
Yes No
7. Are the majority of crib audits satisfactory?
Yes No

Signature of Person Completing the Audit: _____

Signature of Safe to Sleep Champion: _____

REFERENCES

A POLICY & EDUCATION DEVELOPMENT GUIDE



THIS
SIDE
UP

GEORGIA
SAFE TO SLEEP
CAMPAIGN

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Integrating "Back to Sleep" Recommendations Into Neonatal ICU Practice

Polina Gelfer, Ricci Cameron, Kathy Masters and Kathleen A. Kennedy

Pediatrics 2013;131:e1264; originally published online March 4, 2013;

DOI: 10.1542/peds.2012-1857

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/131/4/e1264.full.html>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2013 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Integrating "Back to Sleep" Recommendations Into Neonatal ICU Practice

Polina Gelfer, Ricci Cameron, Kathy Masters and Kathleen A. Kennedy

Pediatrics 2013;131:e1264; originally published online March 4, 2013;

DOI: 10.1542/peds.2012-1857

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/131/4/e1264.full.html>

References

This article cites 14 articles, 6 of which can be accessed free at:
<http://pediatrics.aappublications.org/content/131/4/e1264.full.html#ref-list-1>

Citations

This article has been cited by 1 HighWire-hosted articles:
<http://pediatrics.aappublications.org/content/131/4/e1264.full.html#related-urls>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Fetus/Newborn Infant
http://pediatrics.aappublications.org/cgi/collection/fetus:newborn_infant_sub
SIDS
http://pediatrics.aappublications.org/cgi/collection/sids_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://pediatrics.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://pediatrics.aappublications.org/site/misc/reprints.xhtml>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2013 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Integrating “Back to Sleep” Recommendations Into Neonatal ICU Practice

abstract

BACKGROUND AND OBJECTIVES: The American Academy of Pediatrics stresses that NICUs should endorse and model the sudden infant deaths syndrome risk-reduction recommendations significantly before anticipated discharge of the infant. Medical personnel are critical role models for parents, and the way they position infants in the hospital strongly influences parental practices at home. The aims of this project were to increase the percentage of infants following safe sleep practices in the NICU before discharge and to determine if improving compliance with these practices would influence parent behavior at home.

METHODS: An algorithm detailing when to start safe sleep practices, a “Back to Sleep” crib card, educational programs for nurses and parents, a crib audit tool, and postdischarge telephone reminders were developed as quality improvement intervention strategies.

RESULTS: NICU compliance with supine positioning increased from 39% to 83% ($P < .001$), provision of a firm sleeping surface increased from 5% to 96% ($P < .001$), and the removal of soft objects from the bed improved from 45% to 75% ($P = .001$). Through the use of a post-discharge telephone survey, parental compliance with safe sleep practices was noted to improve from 23% to 82% ($P < .001$).

CONCLUSIONS: Multifactorial interventions improved compliance with safe sleep practices in the NICU and at home. *Pediatrics* 2013;131:e1264–e1270

AUTHORS: Polina Gelfer, MD,^{a,b} Ricci Cameron, BSN, RNC-NIC,^b Kathy Masters, Six Sigma Master Black Belt,^c and Kathleen A. Kennedy, MD, MPH^{a,b}

^a*Division of Neonatal-Perinatal Medicine, University of Texas Medical School, Houston, Texas; and* ^b*Neonatal ICU, and* ^c*Quality Improvement and Leadership Academy, Memorial Hermann Hospital, Houston, Texas*

KEY WORDS

sudden infant death syndrome, safe sleep practice, premature infant, quality improvement

ABBREVIATIONS

AAP—American Academy of Pediatrics
CMHH—Children’s Memorial Hermann Hospital
SIDS—sudden infant death syndrome
SSP—safe sleep practices

Dr Gelfer conceptualized and designed the project, designed the data collection instruments, coordinated and supervised data collection, drafted the initial manuscript, and approved the final manuscript as submitted; Ms Cameron conceptualized and designed the project, participated in designing the data collection instruments, reviewed and revised the manuscript, and approved the final manuscript as submitted; Ms Masters conceptualized and designed the project, carried out the initial analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted; and Dr Kennedy conceptualized and designed the project, carried out the final analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted.

www.pediatrics.org/cgi/doi/10.1542/peds.2012-1857

doi:10.1542/peds.2012-1857

Accepted for publication Nov 7, 2012

Address correspondence to Polina Gelfer, MD, Division of Neonatal-Perinatal Medicine, The University of Texas at Houston Medical School, 6431 Fannin St, Houston, TX 77030. E-mail: polina.gelfer@uth.tmc.edu

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2013 by the American Academy of Pediatrics

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationship relevant to this article to disclose.

FUNDING: No external funding.

Sudden infant death syndrome (SIDS) remains the third leading cause of infant mortality in the United States.^{1,2} Epidemiologic studies have demonstrated a strong association between infant sleep position, sleeping environment, and SIDS. The most recent American Academy of Pediatrics (AAP) guidelines stress the following preventive safe sleep practices (SSPs): supine-only position for sleep, a firm sleep surface, no soft objects in the crib, no loose bedding in the crib, no bed sharing, avoidance of overheating the infant, and elimination of infant exposure to smoking.³ Sleeping position and environment are emphasized as crucial modifiable risk factors for SIDS. Despite the aggressive, nationwide “Back to Sleep” campaign, SIDS continues to be one of the leading causes of postneonatal infant deaths, and the majority of these deaths still occur when the above SSPs are not followed.^{4–6}

Premature and low-birth-weight infants have a higher risk of SIDS than term infants,^{7,8} and very-low-birth-weight infants are more likely to sleep in the nonsupine position after discharge than larger low-birth-weight infants.⁹ These numbers are particularly concerning because the rate of prematurity in the United States remains high (12% of all births).¹⁰ Parental knowledge and acceptance of SSPs are key to decreasing the risk of unexpected deaths. Studies have indicated that nurses and other medical personnel play critical roles in parental education: the way infants are positioned in the hospital strongly influences parental practices at home.^{9,11,12}

Full implementation of the AAP guidelines on SSPs is challenging in the NICU environment. Prone sleeping positions are encouraged early in the hospital course to optimize respiratory mechanics.¹³ Because non-oxygen-dependent healthy preterm infants nearing dis-

charge have similar breathing patterns and work of breathing in the prone versus supine position,¹⁴ there should be no impediment to transitioning these infants to the supine sleeping position at some point before discharge. When caring for preterm infants, nurses often use special aids or blanket rolls to position infants and may apply extra blankets to improve thermoregulation when weaning infants from incubators to open cribs. Nonetheless, in its updated recommendations from 2011, the AAP stressed that NICUs should endorse and model the SIDS risk-reduction recommendations significantly before the infant's anticipated discharge.³

SSPs and SIDS reduction strategies are typically introduced to parents by bedside nurses before discharge. However, there is a significant knowledge gap in SIDS prevention measures and implementation among NICU nurses who discharge infants. In a survey of 430 nurses, just 42% to 64% of NICU nurses (depending on the component of SSPs) identified themselves as always following safe sleep recommendations when preparing infants for discharge.¹⁵ Another survey showed that only half of NICU nurses advised parents to place their infant exclusively supine after discharge.¹⁶

The aims of this project were to develop a safe sleep educational and modeling program for the NICU, to develop a process to identify which infants are ready to begin SSPs in the NICU, to increase the percentage of eligible infants following SSPs before discharge, and to determine if improving compliance in the unit influences parental choices at home.

METHODS

The project was reviewed and approved by the Children's Memorial Hermann Hospital (CMHH) Quality Council. The project activities were part of the regular hospital education and quality

improvement activities; identifiable information about patients, parents, and nurses was not collected. The project was carried out over a 7-month period from May to November 2010.

Setting

The CMHH NICU is a large tertiary care unit in Houston, Texas, with an average census of 100 infants. There are 900 to 1000 admissions to the NICU per year; approximately one-third are born outside CMHH. During random crib audits in May and June 2010 performed in the level II nursery at CMHH, only 39% of infants were sleeping in the supine position, 5% had a firm sleeping surface, and 45% had no soft objects in bed. Although these hospitalized infants were not at risk because they were being continuously monitored, pre-discharge sleep practices that conflict with the AAP recommendations for SIDS prevention are likely to be continued after discharge when the infants are no longer being monitored. Furthermore, a postdischarge telephone survey of parents, done at the same time along with crib audits, showed that only 23% of parents reported full compliance with SSPs at home.

Overall Framework

A quality improvement model was developed to translate the AAP guidelines on SSPs into nursing practice in our NICU. The project team worked closely with all key stakeholders, including representatives from administration, nursing, physical and occupational therapy, and physicians. Team members met regularly once or twice a month for the duration of the project. They were responsible for developing a unit guideline on SSPs, educational materials for nurses and parents, visual cues for staff, a tool for auditing cribs, and conducting a parental survey. Team members performed literature searches and group interviews with

physicians, nurses, and parents to identify facilitators and barriers for developing and implementing safe sleep policies in premature infants. The project was divided into before-intervention (May–June), intervention (July–September), and after-intervention (October–November) phases. The before-intervention phase was defined as the time before any interventions or staff interviews were started. The intervention phase included the development of nursing guidelines and education of staff nurses on SSPs. The after-intervention phase was measured after the nursing guidelines and nursing education campaign on SSPs were completed.

Intervention and Implementation

All nurses in the NICU were required to complete the continuing education program on SIDS risk reduction developed by the National Institute of Child Health and Human Development.¹⁷ They were also tested on safe sleep role modeling during their annual skills evaluation. The National Institute of Child Health and Human Development computer module took about 1 hour to complete and provided 1 hour of continuing education credit for the nurses. The module covered theories of SIDS etiology, outlined modifiable and nonmodifiable risk factors, and provided strategies on risk reduction. Numerous question and answer sessions with the nursing staff were conducted to educate them on issues regarding specific implementation strategies for our NICU. The project was also discussed with the physicians in a division meeting to elicit their acceptance and incorporate their suggestions.

On the basis of the literature review, expert opinions, and numerous unit discussions, an algorithm was developed to determine when an infant was ready to start SSPs in our NICU (Fig 1).

NICU therapeutic positioning was defined as positions (prone, side-lying, elevated head of bed, etc.) and positioning tools (positioning aids, blanket rolls) used in the NICU for medical reasons but not appropriate for the routine home environment. SSP included the following components: sleeping on the back on a firm, flat mattress covered by a fitted sheet; blanket positioned in such a manner that it stays below the shoulders, preventing possible airway obstruction; a crib free of loose material including pillow-like stuffed toys and bumper pads; and room temperature that is comfortable for a lightly clothed adult (21.13–23.35°C).^{21–23}

A laminated “Back to Sleep” crib card based on the AAP’s recommendations was developed (Fig 2). The clinical staff was responsible for putting the card on all open cribs. The crib card was used to remind medical providers and parents that the infant had started SSPs. This form of implementation would also cue nurses to provide discharge teaching to the parents. The crib card had 2 sides: one with an explanation of SSPs and the other with NICU therapeutic positioning for infants who were not ready to start SSP; it was secured to the crib with the appropriate side up. At discharge, parents received a different Back to Sleep card with the SSP recommendations on one side and cardiopulmonary resuscitation tips on the other side for use on the baby’s crib at home.

SIDS education was offered to all parents. Parents were encouraged to watch the DVD on safe sleep education from the First Candle Foundation (www.firstcandle.org); the DVD explained how to implement SSPs in the home setting. The DVD method was used to provide consistent and accurate information. A written parent discharge instruction sheet containing language-appropriate information on

SSPs was given to every family; neonatal nurses reviewed the instructions with parents before discharge. SSP strategies were also included in the agenda of the discharge educational class for parents.

Methods of Evaluation

A crib audit tool was developed to monitor in-hospital compliance with SSPs and limit the variability among observers. A single-page form was created to collect information on the sleep position of the infant (back, prone, side), presence of firm sleep surface, and absence of extra soft objects in the bed. Only cribs of the SSP-eligible infants were selected for auditing (Fig 1, Initiating SSP Algorithm). Multiple audits were conducted by different quality improvement team members in each phase of the project. There were 2 or 3 days on which audits were conducted in each phase. They were taken during weekdays on day shifts without previous warning to the staff nurses.

A questionnaire was developed to monitor parental compliance with SSPs at home after discharge (Table 1). This questionnaire was added to the routine postdischarge telephone courtesy calls. Parents of all discharged patients were routinely contacted by phone within several days of discharge. A maximum of 2 attempts was made to reach a parent. Parents were asked about SSPs and provided with counseling if incorrect practices were identified. A pilot survey was conducted to assess understanding of the questions. The surveys were provided before, during, and after the implementation of the changes. A parent was counted as fully compliant only if all requirements of SSPs were always in place (eg, if parent answered “sometimes” when the correct response was “always,” the

Initiating SSP Algorithm

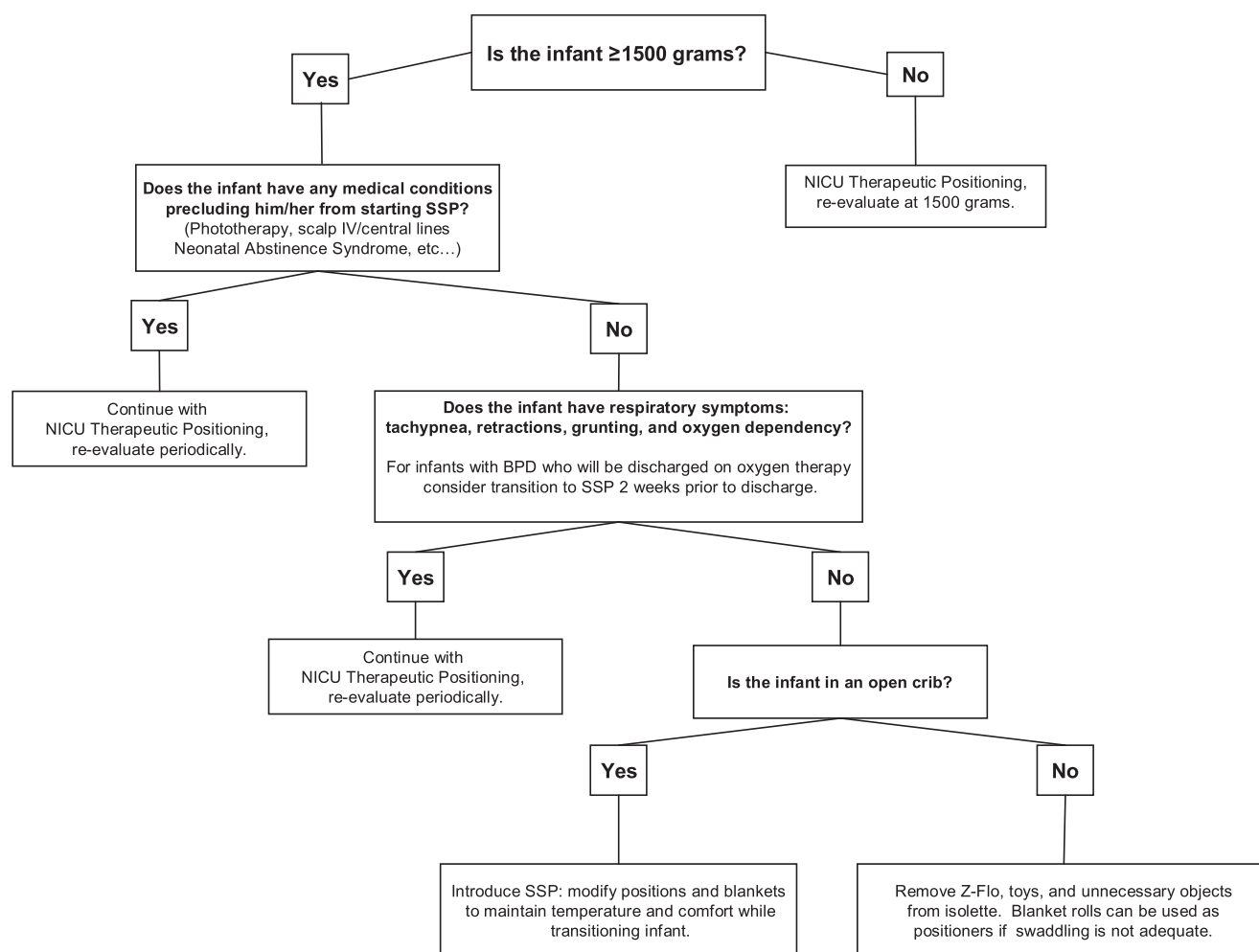


FIGURE 1

Algorithm to determine when an infant is ready to begin SSPs. BPD, bronchopulmonary dysplasia.

compliance was counted as not fully compliant). The results of the crib audits and parental surveys were displayed in the nursing lounges for review and feedback to reinforce the educational measures.

Analysis

Comparisons between the before- and after-implementation phases were made by using Fisher's exact test (Stata 11.0; StataCorp, College Station, TX). The nurses' participation with education was monitored by the NICU's clinical nurse educators by collecting copies of continuing education certificates.

RESULTS

Consensus Building

Despite reaching the consensus that the AAP guidelines should be implemented, multiple group interviews of the nurses, physicians, and auxiliary staff revealed persistent attitudinal barriers to the program. Many nurses were aware of the AAP recommendations but still continued to believe that other positions, mainly side positions, were safer for infants, especially after their feedings. Education, along with a recommended hospital policy, helped modify nurses' beliefs and behaviors toward putting infants

to sleep on their backs. Our NICU staff is composed of 236 nurses; 189 nurses (around 80%) completed Back to Sleep training. Maintenance of education was accomplished by including questions on SSPs and Back to Sleep in the annual nursing competency assessment and in the online program for all new employees.

At the beginning of the project, numerous staff members were also concerned with the implementation of the Back to Sleep recommendations in fragile premature infants who spend a majority of their time in their beds; concerns focused on the possibility that putting those infants exclusively

NICU Therapeutic Positioning

Examples of when NICU Therapeutic Positioning is appropriate:

- Respiratory symptoms such as tachypnea, retractions, grunting and oxygen dependency
- Nasal CPAP
- Nasal Cannula requirements other than home oxygen requirements
- Phototherapy
- Scalp IV or central lines
- Neonatal Abstinence Syndrome
- Lack of handling due to social reasons (please address with primary team)
- Any medical condition that requires prone or side lying positioning
- If tummy time cannot be implemented due to inability to be positioned prone (such as ostomy/surgical site)

Continue to evaluate infant for readiness to start Back to Sleep positioning

Ready for Back to Sleep

- Back to Sleep is recommended by the AAP and should be implemented prior to discharge.
- Arms in or arms out are both acceptable ways to swaddle an infant based on its needs.
- Cold infants are not happy infants. Dress infants appropriately and use extra blankets if necessary.
- Keep unnecessary blankets, toys, and soft objects out of the infant's bed space.
- Tummy time should be encouraged when alert and should be supervised by a parent or caregiver.
- Opportunities for tummy time are during an assessment or when a nurse is warming a feed.
- Swaddling is safe. Keep the blankets from going above the infant's shoulder line.
- Look through the guideline located on *SharePoint* for more detailed information on Back to Sleep.
- Educate parents on a safe sleep environment and practice with the parent crib card, DVD, and discussion.
- Encourage the use of a pacifier.
- Prevent plagiocephaly by encouraging tummy time when the infant is awake.

FIGURE 2

Each infant's crib had a crib card that would either recommend therapeutic positioning or Back to Sleep practices depending on the readiness to begin SSPs.

TABLE 1 Postdischarge Survey Included as Part of the Routine Follow-up Telephone Courtesy Call Made Within Days After Discharge

	Never	Sometimes	Almost Always	Always
1. Do you put your baby on his back to sleep?				
2. Does your baby sleep in his own crib/bassinette?				
3. Is your baby exposed to cigarette smoke?				
4. Do you dress your baby in as much or as little as you would wear?				
5. Does your baby sleep on a firm mattress?				
6. Do you keep toys or extra blankets in your baby's crib?				

If incorrect practices were identified, further counseling provided advice on how to pursue SSPs based on the AAP recommendations.

supine might negatively affect their respiratory function and predispose them to a higher risk of plagiocephaly. Through numerous discussions, we eventually reached consensus about the patients who qualified to start the SSPs (Fig 1). Through this process, it became clear that finding the optimal time to transition our infants to SSPs was a fundamental key to increasing the nurses' acceptance and compliance.

Crib Audits

In our NICU, about 20% to 30% of the patients are in open cribs and otherwise eligible for SSPs. A total of 227 cribs were audited during the project time. Sixty-two cribs were audited in the before-implementation phase and 79 cribs were audited after the new policies were fully implemented. Infants who were being held or engaged in supervised activities were not assessed for sleeping position. Overall, during the

project period, there was a significant increase in the rate of supine positioning from 39% during the baseline period to 83% after a 3-month implementation period ($P < .001$; Fig 3). Provision of a firm sleeping surface increased from 5% to 96% ($P < .001$), and the removal of soft objects in the bed improved from 45% to 75% ($P = .001$).

Surveying Parental Compliance After Discharge

Of the total of 338 parents that were called after discharge, 259 parents replied with an overall response rate of 77%. Among responders were 66 parents in the pre-intervention phase (65% response rate) and 98 parents in the post-intervention phase (80% response rate). There was a significant increase in the percent of parents fully compliant with SSPs in the after-implementation phase (before-implementation, 23%; after-intervention phase, 82%; $P < .001$). Among the SSP components, we observed the largest improvements in putting infants to sleep on the back (93% vs 73%), dressing infants appropriately (93% vs 66%), and removing extra soft blankets from the crib (97% vs 61%). The other components had relatively high compliance in the pre- and postintervention phases: sleeping in own bed (96% vs 94%); no smoking exposure (98% vs 99%); and sleeping on a firm mattress (94% vs 99%). During the postdischarge telephone survey, a number of parents spontaneously positively commented on the use of crib cards as visual reminders.

DISCUSSION

What parents observe in the hospital regarding SSPs has a significant effect on what they do at home after discharge. To encourage safe practices at home, it is essential to initiate them during the hospital stay as the

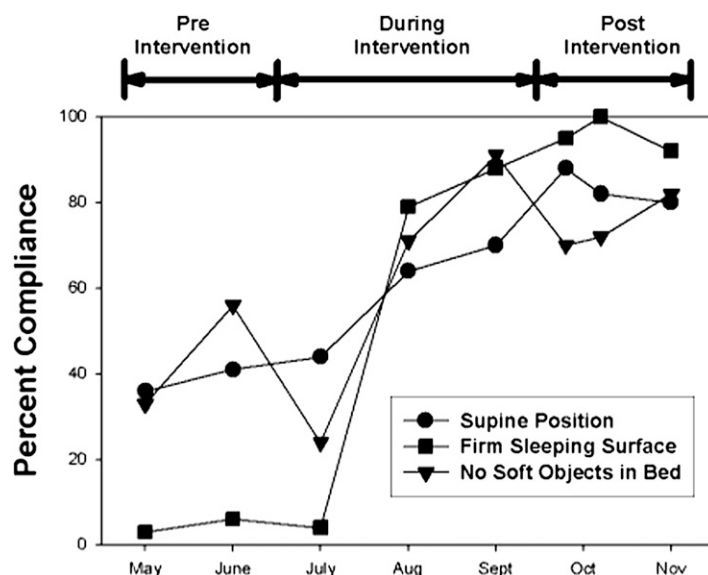


FIGURE 3
Run chart of the compliance with SSP components.

beginning of a consistent safe sleep routine.

Although the AAP recommends positioning premature babies on their backs for sleep well before discharge, it is unclear when preterm infants should transition to supine sleeping. One survey showed that the majority of units in the United Kingdom began supine sleeping at least 1 to 2 weeks before discharge or when monitoring for apnea was no longer used and the infant could be nursed in a crib rather than an incubator.¹⁸

The use of positioning devices along with soft bedding material has been advocated for the developmental support of preterm infants in the NICU, even though the benefits are unproven. There is evidence for respiratory advantages of prone positioning in premature infants with respiratory symptoms,^{13,19} but these advantages were not found in preterm infants off oxygen and nearing discharge.¹⁴ Soon after discharge, SIDS becomes the leading cause of death, and the physiologic benefits of prone positioning for oxygen-dependent infants must be weighed against the increased risk of dying suddenly and unexpectedly in the prone position.

It seems reasonable to transition the infant to a supine sleeping position as soon as physiologically stable. A simple operational definition of “physiologically stable” is needed for implementation of SSPs in the NICU.

This project offers one institution's approach to the implementation of the AAP recommendations for infants' sleep positioning, a guideline primarily directed toward healthy term infants, in the NICU. Our primary implementation strategy was education for nurses and parents and development of unit guidelines based on existing evidence and our own medical staff input. Multiple presentations, question and answer sessions, and consensus discussions helped to identify barriers and possible solutions. We were able to address potential attitudinal barriers such as fear of aspiration and claims that the program compromised developmental care principles through an educational campaign. We believe that an important key to our success was early involvement of key stakeholders including administration, nurses, nurse educators, occupational/physical therapists, and physicians. We empowered our nursing and medical staff with knowledge and included their input

into the new unit policy. The results of this project confirmed that the incorporation of SIDS risk-reduction strategies into the hospital nursing routine can positively affect parental postdischarge practices.

This project has several limitations. Demographic data on the survey responders were not obtained; therefore, it is not known if the groups compared were similar in their educational level, age, and racial distribution. The absence of demographic data may present the possibility for selection bias. We did not collect detailed information regarding the consistency with which intervention components were implemented or what the nurses included in the discharge teaching. Because we implemented a multifaceted program at one time, we do not know the intensity of the use of each intervention and therefore could not determine which intervention components had the greatest effect.

Currently, ongoing efforts by the nursing administration and nursing educators are directed at maintaining or improving our postintervention results. If the results of this project are to be reproduced in other units, we recommend local adaptation to incorporate these practices into the routine work flow. In our case, SSPs were most conveniently triggered at transition from incubator to open crib. Success with these practices requires commitment from both nursing administration and medical staff to prioritize SSPs into routine care practices and discussions with families.

ACKNOWLEDGMENTS

We thank the nursing staff and the nursing leadership team of the Children's Memorial Hermann Hospital, particularly Dinah L. Lovejoy-Naumann and Patricia Brandl, for their significant contribution to this project and participation in the data collection process.

REFERENCES

- Center for Disease Control and Prevention. Sudden unexpected infant death. Available at: www.cdc.gov/SIDS/index.htm. Accessed April 12, 2011
- Center for Disease Control and Prevention. National vital statistics report. Available at: www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf. Accessed February 2, 2012
- Moon RY; Task Force on Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*. 2011;128(5):1030–1039
- Texas Department of State Health Services. Texas CFRAR. Available at: www.dshs.state.tx.us/mch/child_fatality_review. Accessed February 2, 2012
- Li DK, Petitti DB, Willinger M, et al. Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *Am J Epidemiol*. 2003;157(5):446–455
- Trachtenberg FL, Haas EA, Kinney HC, Stanley C, Krous HF. Risk factor changes for sudden infant death syndrome after initiation of Back-to-Sleep campaign. *Pediatrics*. 2012;129(4):630–638
- Malloy MH, Hoffman HJ. Prematurity, sudden infant death syndrome, and age of death. *Pediatrics*. 1995;96(3 Pt 1):464–471
- Halloran DR, Alexander GR. Preterm delivery and age of SIDS death. *Ann Epidemiol*. 2006;16(8):600–606
- Vernacchio L, Corwin MJ, Lesko SM, et al. Sleep position of low birth weight infants. *Pediatrics*. 2003;111(3):633–640
- Center for Disease Control and Prevention. National vital statistics report. Available at: www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_02.pdf. Accessed February 2, 2012
- Colson ER, Joslin SC. Changing nursery practice gets inner-city infants in the supine position for sleep. *Arch Pediatr Adolesc Med*. 2002;156(7):717–720
- Shaefer SJ, Herman SE, Frank SJ, Adkins M, Terhaar M. Translating infant safe sleep evidence into nursing practice. *J Obstet Gynecol Neonatal Nurs*. 2010;39(6):618–626
- Wolfson MR, Greenspan JS, Deoras KS, Allen JL, Shaffer TH. Effect of position on the mechanical interaction between the rib cage and abdomen in preterm infants. *J Appl Physiol*. 1992;72(3):1032–1038
- Levy J, Habib RH, Liptsen E, et al. Prone versus supine positioning in the well preterm infant: effects on work of breathing and breathing patterns. *Pediatr Pulmonol*. 2006;41(8):754–758
- Grazel R, Phalen AG, Polomano RC. Implementation of the American Academy of Pediatrics recommendations to reduce sudden infant death syndrome risk in neonatal intensive care units: An evaluation of nursing knowledge and practice. *Adv Neonatal Care*. 2010;10(6):332–342
- Aris C, Stevens TP, Lemura C, et al. NICU nurses' knowledge and discharge teaching related to infant sleep position and risk of SIDS. *Adv Neonatal Care*. 2006;6(5):281–294
- National Institute of Child Health and Human Development (NICHD). Continuing education program on SIDS risk reduction. Available at: www.nichd.nih.gov/SIDS/nursececourse/Welcomes.aspx. Accessed February 2, 2012
- Rao H, May C, Hannam S, Rafferty GF, Greenough A. Survey of sleeping position recommendations for prematurely born infants on neonatal intensive care unit discharge. *Eur J Pediatr*. 2007;166(8):809–811
- Kassim Z, Donaldson N, Khatriwal B, et al. Sleeping position, oxygen saturation and lung volume in convalescent, prematurely born infants. *Arch Dis Child Fetal Neonatal Ed*. 2007;92(5):F347–F350



The National Safe Sleep Hospital Certification Program Criteria for Designation

To be designated a *Certified Safe Sleep Hospital*, the hospital must:

1. Develop and maintain a Safe Sleep Policy (see **POLICY** on page 2);
2. Provide staff working on the units serving infants and children under the age of 1 with training on infant safe sleep (see **STAFF TRAINING** on page 3);
3. Provide infant safe sleep education to the parents of infants prior to discharge (see **PARENT EDUCATION** on page 4);

To be designated a *Certified Safe Sleep Leader*, in addition to the above criteria, the hospital must:

1. Make use of wearable blankets in the Well-Baby Nursery and Neonatal Intensive Care Unit, as applicable. (see **WEARABLE BLANKET PROGRAM** on page 5);
2. **AUDIT** – Record your progress and report your successes with the use of our PDSA tool. (See PDSA Cycle worksheet on 6).

To be designated a *Certified Safe Sleep Champion*, in addition to the above criteria, the hospital must:

1. Conduct outreach activities related to infant safe sleep (see **COMMUNITY OUTREACH** on page 8);
2. Affiliate with or become a Cribs for Kids® Partner (see **CRIBS FOR KIDS®** on page 9).

The following expands on the requirements to be designated a *Certified Safe Sleep Hospital, Leader or Champion*. Each page contains three sections:

1. **Criteria.** In order to achieve a designation, you must meet – or exceed – each criterion.
2. **Documentation.** Please make the documentation available to Cribs for Kids® upon request.
3. **Resource.** Multiple resources have been provided in an effort to facilitate the process of achieving a designation.

* If your hospital is working toward achieving the requirements for Safe Sleep Certification, please contact Cribs for Kids®. Our goal is to help your hospital achieve a designation.

Cribs for Kids® would like to thank the North Carolina Healthy Start Foundation for generously sharing the materials for the Infant Safe Sleep Model of Excellence Award in North Carolina in the name of saving babies nationwide.

POLICY

The following is required to be designated a Certified Safe Sleep Hospital

Criteria:

- Develop and maintain a Safe Sleep Policy that is consistent with the recommendations of the American Academy of Pediatrics (AAP). The Safe Sleep Policy must be in current operation, as well as in practice for at least three months prior to the date of application. The Safe Sleep Policy must include the following:
 - The provision of training on infant safe sleep to staff working on the units serving infants and children under the age of 1;
 - The provision of infant safe sleep education to the parents of infants prior to discharge.

Documentation:

- If requested, please provide a copy of the hospital's Safe Sleep Policy with an effective date of at least three months prior to when the application is submitted.

Resource:

- A sample Safe Sleep Policy is available from Cribs for Kids®. The document can be accessed at <http://www.cribsforkids.org/hospital-initiative-toolkit/>.
- A sample Safe Sleep Policy is available from First Candle. The document can be accessed at http://www.firstcandle.org/modelbehavior/docs/WBU_booklet1.pdf.

STAFF TRAINING

The following is required to be designated a Certified Safe Sleep Hospital

Criteria:

- ☐ Provide staff working on the units serving infants and children under the age of 1 with training on infant safe sleep. The training can be direct contact (e.g., lecture) and/or computer-based.
- ☐ Provide new staff working on the units serving infants and children under the age of 1 with training on infant safe sleep within 3 months of hire.
- ☐ Provide staff working on the units serving infants and children under the age of 1 with annual trainings on infant safe sleep and/or updated information on the most current data and practice standards.

Documentation:

- ☐ If requested, please provide a training log (or similar document) including a description of the training and the date of the training.
- ☐ If requested, please complete the Checklist of Standard Materials (see page 8) to indicate which materials are used for training. If the material used is not on the checklist, please send it to Cribs for Kids® for approval.

Resource:

- Training materials and curriculum are available from the Eunice Kennedy Shriver National Institute of Child Health and Human Development Safe to Sleep® Public Education Campaign. The training materials and curriculum can be accessed at <http://www.nichd.nih.gov/sts/Pages/default.aspx>.
- Training materials and curriculum are also available from Cribs for Kids®. The training materials and curriculum can be accessed via the Hospital Initiative Toolkit at <http://www.cribsforkids.org/hospital-initiative-toolkit/>.

PARENT EDUCATION

The following is required to be designated a Certified Safe Sleep Hospital

Criteria:

- ❑ Provide infant safe sleep education to the parents of infants prior to discharge. Provision of parental education must be documented in the patient's chart. Education can be provided by an educational video or DVD or educational material(s), but it must be supplemented by direct dialogue.
- ❑ Model appropriate safe sleep behavior [per the recommendations for infant safe sleep from the American Academy of Pediatrics (AAP)] unless contraindicated for documented medical reasons with a physician's order.

Documentation:

- ❑ If requested, please provide a statement indicating the above criteria is hospital policy.
- ❑ If requested, please complete the Checklist of Standard Materials (see page 8) to indicate which materials are used for education. If the material used is not on the checklist, please send it to Cribs for Kids® for approval.

Resource:

- Materials are available from the Eunice Kennedy Shriver National Institute of Child Health and Human Development Safe to Sleep® Public Education Campaign. The materials can be accessed at <http://www.nichd.nih.gov/sts/Pages/default.aspx>.
- Materials (including *Safe Sleep for Your Baby Right from the Start*, an educational DVD) are also available from Cribs for Kids®. The materials can be accessed via the Hospital Initiative Toolkit at <http://www.cribsforkids.org/hospital-initiative-toolkit/>.
- Additional DVDs can be found with reviews at: <http://www.mchlibrary.org/suid-sids/SafeSleep/videos.html>
- Safe Sleep bi-lingual handouts and door hangers available at <http://www.cribsforkids.org/hospital-initiative-toolkit/> and <http://www.halosleep.com/halo-in-hospitals/>

WEARABLE BLANKET PROGRAM

The following is required to be designated a Certified Safe Sleep Leader.

Criteria:

- ☐ Implement the use of wearable blankets (replacing traditional blankets) in the Neonatal Intensive Care Unit (NICU) and the Well-Baby Nursery.

Documentation:

- ☐ If requested, please provide a document describing the hospital's wearable blanket program.

Resource:

- Information on the HALO® In-Hospital SleepSack® Program is available at <http://www.halosleep.com/in-hospital-sleepsack-program/>.
- Institutional laundering recommendations are available at <http://www.halosleep.com/laundry-guidelines/>.

AUDITS AND PDSA CYCLES

The following is required to be designated a Certified Safe Sleep Leader and Safe Sleep Champion.

Criteria:

- Implement the use of one of the following:*
 - 2 PDSA cycles over the course of a calendar year
 - 2 audits of modeling of safe sleep behaviors in the hospital.
- *May do one of each of the above.

Documentation:

- If requested, please provide a document describing the hospital's PDSA cycle and results OR the results of the audit.

Resource:

- Information on PDSA cycles is available at http://www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/plan_do_study_act.html
- Information on audit tools is available at <http://www.cribsforkids.org/hospital-initiative-toolkit/>.

Safe Sleep Audit Tool

Date: _____

Auditor: _____

<i>Patient #</i>	<i>Head of bed Flat? Y or Degree of elevation</i>	<i>Patient Asleep Supine? Y or N</i>	<i>Multiple Blankets to Crib? Y or N</i>	<i>Stuffed Animals in Crib? Y or N</i>	<i>Large or Fluffy Blankets Around Pt.? Y or N</i>	<i>Patient in Nest Y or N</i>	<i>Patient Bundled? Y or N</i>	<i>Patient Able to Move Legs? Y or N</i>	<i>Positioning Device used? Y or N</i>
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Y – Yes N- No

COMMUNITY OUTREACH

The following is required to be designated a Certified Safe Sleep Champion.

Criteria:

- ❑ Conduct outreach activities related to infant safe sleep. The hospital must conduct at least two outreach activities per year. Outreach activities can include but are not limited to:
 - Broadcast of a Public Service Announcement (PSA) related to infant safe sleep;
 - Participate in a health fair;
 - Providing infant safe sleep education at a church or community center;
 - Publishing an editorial in the local newspaper.
- ❑ Display educational material (e.g., a poster illustrating an infant safe sleep environment) in appropriate departments of the hospital.
- ❑ Include information on infant safe sleep on the hospital's website.

Documentation:

- ❑ If requested, please provide a document describing the outreach activities including the type of activity, the date of the activity, the location of the activity, and the number of people who participated in the activity. If desired, please send photographs taken at the outreach activity to Cribs for Kids®. Printed material (e.g., press release) can also be sent.

Resource:

- Sample outreach materials are available from the Eunice Kennedy Shriver National Institute of Child Health and Human Development Safe to Sleep® Public Education Campaign. The outreach materials can be accessed at <http://www.nichd.nih.gov/sts/Pages/default.aspx>.
- Other materials are also available from Cribs for Kids®. The materials can be accessed via the Hospital Initiative Toolkit at <http://www.cribsforkids.org/hospital-initiative-toolkit/>.

The following is required to be designated a Certified Safe Sleep Champion.

Criteria:

- Become a Cribs for Kids® Partner or provide a letter of support from your local Cribs for Kids partner documenting your affiliation or support of their program. The goal is to insure that every new family leaving the hospital has a safe sleep environment for their infant.

Documentation:

- If requested, please provide a copy of the signed Cribs for Kids® Trademark License Agreement.

Resource:

- Information on becoming a Cribs for Kids® Partner and purchasing Graco® Pack ‘n Plays® from Cribs for Kids® is available at <http://www.cribsforkids.org/become-a-partner/>.



**The National Safe Sleep Hospital Certification Program
Checklist of Standard Materials**

Please indicate which materials are used for staff training and which materials are used for parent education. If the material used is not on the checklist, please send it to Cribs for Kids® for approval.

Staff Training	Parent Education	Material Source
<input type="checkbox"/>	<input type="checkbox"/>	Cribs for Kids®
<input type="checkbox"/>	<input type="checkbox"/>	National Institute of Child Health and Human Development Safe to Sleep® Public Campaign
<input type="checkbox"/>	<input type="checkbox"/>	HALO Innovations®
<input type="checkbox"/>	<input type="checkbox"/>	First Candle
<input type="checkbox"/>	<input type="checkbox"/>	The American Academy of Pediatrics
<input type="checkbox"/>	<input type="checkbox"/>	C J Foundation for SIDS
<input type="checkbox"/>	<input type="checkbox"/>	Safe Kids Worldwide
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME

Pediatrics; originally published online October 17, 2011;

DOI: 10.1542/peds.2011-2284

The online version of this article, along with updated information and services, is
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2011/10/12/peds.2011-2284>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2011 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME

Pediatrics; originally published online October 17, 2011;

DOI: 10.1542/peds.2011-2284

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/early/2011/10/12/peds.2011-2284>

Citations

This article has been cited by 33 HighWire-hosted articles:
<http://pediatrics.aappublications.org/content/early/2011/10/12/peds.2011-2284#related-urls>

Post-Publication Peer Reviews (P³Rs)

One P³R has been posted to this article:
<http://pediatrics.aappublications.org/cgi/eletters/peds.2011-2284v1>

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://pediatrics.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://pediatrics.aappublications.org/site/misc/reprints.xhtml>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2011 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™





POLICY STATEMENT

SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

abstract

FREE

Despite a major decrease in the incidence of sudden infant death syndrome (SIDS) since the American Academy of Pediatrics (AAP) released its recommendation in 1992 that infants be placed for sleep in a non-prone position, this decline has plateaued in recent years. Concurrently, other causes of sudden unexpected infant death that occur during sleep (sleep-related deaths), including suffocation, asphyxia, and entrapment, and ill-defined or unspecified causes of death have increased in incidence, particularly since the AAP published its last statement on SIDS in 2005. It has become increasingly important to address these other causes of sleep-related infant death. Many of the modifiable and nonmodifiable risk factors for SIDS and suffocation are strikingly similar. The AAP, therefore, is expanding its recommendations from focusing only on SIDS to focusing on a safe sleep environment that can reduce the risk of all sleep-related infant deaths, including SIDS. The recommendations described in this policy statement include supine positioning, use of a firm sleep surface, breastfeeding, room-sharing without bed-sharing, routine immunizations, consideration of using a pacifier, and avoidance of soft bedding, overheating, and exposure to tobacco smoke, alcohol, and illicit drugs. The rationale for these recommendations is discussed in detail in the accompanying “Technical Report—SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment,” which is included in this issue of *Pediatrics* (www.pediatrics.org/cgi/content/full/128/5/e1341). *Pediatrics* 2011;128:1030–1039

INTRODUCTION

Sudden infant death syndrome (SIDS) is a cause assigned to infant deaths that cannot be explained after a thorough case investigation, including a scene investigation, autopsy, and review of the clinical history.¹ Sudden unexpected infant death (SUID), also known as sudden unexpected death in infancy, is a term used to describe any sudden and unexpected death, whether explained or unexplained (including SIDS), that occurs during infancy. After case investigation, SUIDs can be attributed to suffocation, asphyxia, entrapment, infection, ingestions, metabolic diseases, arrhythmia-associated cardiac channelopathies, and trauma (accidental or nonaccidental). The distinction between SIDS and other SUIDs, particularly those that occur during an observed or unobserved sleep period (sleep-related infant deaths), such as ac-

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME

KEY WORDS

SIDS, sudden infant death, infant mortality, sleep position, bed-sharing, tobacco, pacifier, immunization, bedding, sleep surface

ABBREVIATIONS

SIDS—sudden infant death syndrome
SUID—sudden unexpected infant death
AAP—American Academy of Pediatrics

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

www.pediatrics.org/cgi/doi/10.1542/peds.2011-2284

doi:10.1542/peds.2011-2284

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2011 by the American Academy of Pediatrics

TABLE 1 Summary and Strength of Recommendations**Level A recommendations**

- Back to sleep for every sleep
- Use a firm sleep surface
- Room-sharing without bed-sharing is recommended
- Keep soft objects and loose bedding out of the crib
- Pregnant women should receive regular prenatal care
- Avoid smoke exposure during pregnancy and after birth
- Avoid alcohol and illicit drug use during pregnancy and after birth
- Breastfeeding is recommended
- Consider offering a pacifier at nap time and bedtime
- Avoid overheating
- Do not use home cardiorespiratory monitors as a strategy for reducing the risk of SIDS
- Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep-related infant deaths, including SIDS, suffocation, and other accidental deaths; pediatricians, family physicians, and other primary care providers should actively participate in this campaign

Level B recommendations

- Infants should be immunized in accordance with recommendations of the AAP and Centers for Disease Control and Prevention
- Avoid commercial devices marketed to reduce the risk of SIDS
- Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly

Level C recommendations

- Health care professionals, staff in newborn nurseries and NICUs, and child care providers should endorse the SIDS risk-reduction recommendations from birth
- Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising
- Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely

These recommendations are based on the US Preventive Services Task Force levels of recommendation (www.uspreventiveservicestaskforce.org/uspstf/grades.htm).

Level A: Recommendations are based on good and consistent scientific evidence (ie, there are consistent findings from at least 2 well-designed, well-conducted case-control studies, a systematic review, or a meta-analysis). There is high certainty that the net benefit is substantial, and the conclusion is unlikely to be strongly affected by the results of future studies.

Level B: Recommendations are based on limited or inconsistent scientific evidence. The available evidence is sufficient to determine the effects of the recommendations on health outcomes, but confidence in the estimate is constrained by such factors as the number, size, or quality of individual studies or inconsistent findings across individual studies. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Level C: Recommendations are based primarily on consensus and expert opinion.

cidental suffocation, is challenging and cannot be determined by autopsy alone. Scene investigation and review of the clinical history are also required. Many of the modifiable and nonmodifiable risk factors for SIDS and suffocation are strikingly similar. This document focuses on the subset of SUIDs that occurs during sleep.

The recommendations outlined herein were developed to reduce the risk of SIDS and sleep-related suffocation, asphyxia, and entrapment among infants in the general population. As defined by epidemiologists, risk refers to the probability that an outcome will occur given the presence of a particular factor or set of factors. Although all of the 18 recommendations cited below are intended for parents, health care providers, and others who care for infants, the last 4 recommendations are also directed toward health policy

makers, researchers, and professionals who care for or work on behalf of infants. In addition, because certain behaviors, such as smoking, can increase risk for the infant, some recommendations are directed toward women who are pregnant or may become pregnant in the near future.

Table 1 summarizes the major recommendations, along with the strength of each recommendation. It should be noted that there have been no randomized controlled trials with regards to SIDS and other sleep-related deaths; instead, case-control studies are the standard.

Because most of the epidemiologic studies that established the risk factors and on which these recommendations are based include infants up to 1 year of age, these recommendations for sleep position and the sleep envi-

ronment should be used consistently for infants up to 1 year of age. Individual medical conditions might warrant that a physician recommend otherwise after weighing the relative risks and benefits.

For the background literature review and data analyses on which this policy statement and recommendations are based, please refer to the accompanying "Technical Report—SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment," available in the online version of this issue of *Pediatrics*.²

RECOMMENDATIONS

1. Back to sleep for every sleep—To reduce the risk of SIDS, infants should be placed for sleep in a supine position (wholly on the back) for every

sleep by every caregiver until 1 year of life.³⁻⁷ Side sleeping is not safe and is not advised.^{4,6}

a. The supine sleep position does not increase the risk of choking and aspiration in infants, even those with gastroesophageal reflux, because they have protective airway mechanisms.^{8,9} Infants with gastroesophageal reflux should be placed for sleep in the supine position for every sleep, with the rare exception of infants for whom the risk of death from complications of gastroesophageal reflux is greater than the risk of SIDS (ie, those with upper airway disorders, for whom airway protective mechanisms are impaired),¹⁰ including infants with anatomic abnormalities such as type 3 or 4 laryngeal clefts who have not undergone antireflux surgery. Elevating the head of the infant's crib while the infant is supine is not recommended.¹¹ It is ineffective in reducing gastroesophageal reflux; in addition, it might result in the infant sliding to the foot of the crib into a position that might compromise respiration.

b. Preterm infants are at increased risk of SIDS,^{12,13} and the association between prone sleep position and SIDS among low birth weight infants is equal to, or perhaps even stronger than, the association among those born at term.¹⁴ Preterm infants and other infants in the NICU should be placed in the supine position for sleep as soon as the infant is medically stable and significantly before the infant's anticipated

discharge, by 32 weeks' postmenstrual age.¹⁵ NICU personnel should endorse safe-sleeping guidelines with parents of infants from the time of admission to the NICU.

c. There is no evidence that placing infants on the side during the first few hours of life promotes clearance of amniotic fluid and decreases the risk of aspiration. Infants in the newborn nursery and infants who are rooming in with their parents should be placed in the supine position as soon as they are ready to be placed in the bassinet.

d. Although data to make specific recommendations as to when it is safe for infants to sleep in the prone or side position are lacking, studies that have established prone and side sleeping as risk factors for SIDS include infants up to 1 year of age. Therefore, infants should continue to be placed supine until 1 year of age. Once an infant can roll from supine to prone and from prone to supine, the infant can be allowed to remain in the sleep position that he or she assumes.

2. Use a firm sleep surface—A firm crib mattress, covered by a fitted sheet, is the recommended sleeping surface to reduce the risk of SIDS and suffocation.

a. A crib, bassinet, or portable crib/play yard that conforms to the safety standards of the Consumer Product Safety Commission and ASTM International (formerly the American Society for Testing and Materials) is recommended.¹⁶ In addition, parents and providers should

check to make sure that the product has not been recalled. Cribs with missing hardware should not be used, and the parent or provider should not attempt to fix broken components of a crib, because many deaths are associated with cribs that are broken or have missing parts (including those that have presumably been fixed). Local organizations throughout the United States can help to provide low-cost or free cribs or play yards for families with financial constraints.

b. Only mattresses designed for the specific product should be used. Mattresses should be firm and maintain their shape even when the fitted sheet designated for that model is used, such that there are no gaps between the mattress and the side of the crib, bassinet, portable crib, or play yard. Pillows or cushions should not be used as substitutes for mattresses or in addition to a mattress. Soft materials or objects such as pillows, quilts, comforters, or sheepskins, even if covered by a sheet, should not be placed under a sleeping infant. If a mattress cover to protect against wetness is used, it should be tightly fitting and thin.

c. Infants should not be placed for sleep on beds because of the risk of entrapment and suffocation.^{17,18} In addition, portable bed rails should not be used with infants because of the risk of entrapment and strangulation.

d. The infant should sleep in an area free of hazards, such

as dangling cords, electric wires, and window-covering cords, because they might present a strangulation risk.

- e. Sitting devices, such as car safety seats, strollers, swings, infant carriers, and infant slings, are not recommended for routine sleep in the hospital or at home.^{19–23} Infants who are younger than 4 months are particularly at risk, because they might assume positions that can create risk of suffocation or airway obstruction. When infant slings and cloth carriers are used for carrying, it is important to ensure that the infant's head is up and above the fabric, the face is visible, and that the nose and mouth are clear of obstructions.²⁴ After nursing, the infant should be repositioned in the sling so that the head is up, is clear of fabric, and is not against the adult's body or the sling. If an infant falls asleep in a sitting device, he or she should be removed from the product and moved to a crib or other appropriate flat surface as soon as is practical. Car safety seats and similar products are not stable on a crib mattress or other elevated surfaces.^{25–29}
3. Room-sharing without bed-sharing is recommended—There is evidence that this arrangement decreases the risk of SIDS by as much as 50%.^{5,7,30,31} In addition, this arrangement is most likely to prevent suffocation, strangulation, and entrapment that might occur when the infant is sleeping in an adult bed.
 - a. The infant's crib, portable crib, play yard, or bassinet should be placed in the parents' bedroom close to the parents' bed. This arrangement reduces SIDS risk and removes the possibility of suffocation, strangulation, and entrapment that might occur when the infant is sleeping in the adults' bed. It also allows close parental proximity to the infant and facilitates feeding, comforting, and monitoring of the infant.
 - b. Devices promoted to make bed-sharing "safe" (eg, in-bed co-sleepers) are not recommended.
 - c. Infants may be brought into the bed for feeding or comforting but should be returned to their own crib or bassinet when the parent is ready to return to sleep.^{6,32} Because of the extremely high risk of SIDS and suffocation on couches and armchairs,^{3,5,6,31,32} infants should not be fed on a couch or armchair when there is a high risk that the parent might fall asleep.
 - d. Epidemiologic studies have not demonstrated any bed-sharing situations that are protective against SIDS or suffocation. Furthermore, not all risks associated with bed-sharing, such as parental fatigue, can be controlled. Therefore, the American Academy of Pediatrics (AAP) does not recommend any specific bed-sharing situations as safe. Moreover, there are specific circumstances that, in epidemiologic studies, substantially increase the risk of SIDS or suffocation while bed-sharing. In particular, it should be stressed to parents that they avoid the following situations at all times:
 - i. Bed-sharing when the infant is younger than 3 months, regardless of whether the parents are smokers or not.^{5,7,31–34}
 - ii. Bed-sharing with a current smoker (even if he or she does not smoke in bed) or if the mother smoked during pregnancy.^{5,6,34–36}
 - iii. Bed-sharing with someone who is excessively tired.
 - iv. Bed-sharing with someone who has or is using medications (eg, certain antidepressants, pain medications) or substances (eg, alcohol, illicit drugs) that could impair his or her alertness or ability to arouse.^{7,37}
 - v. Bed-sharing with anyone who is not a parent, including other children.³
 - vi. Bed-sharing with multiple persons.³
 - vii. Bed-sharing on a soft surface such as a waterbed, old mattress, sofa, couch, or armchair.^{3,5,6,31,32}
 - viii. Bed-sharing on a surface with soft bedding, including pillows, heavy blankets, quilts, and comforters.^{3,38}
 - e. It is prudent to provide separate sleep areas and avoid co-bedding for twins and higher-order multiples in the hospital and at home.³⁹
4. Keep soft objects and loose bedding out of the crib to reduce the risk of SIDS, suffocation, entrapment, and strangulation.
 - a. Soft objects, such as pillows and pillow-like toys, quilts, comfort-

- ers, and sheepskins, should be kept out of an infant's sleeping environment.^{40–45}
- b. Loose bedding, such as blankets and sheets, might be hazardous and should not be used in the infant's sleeping environment.^{3,6,46–51}
 - c. Because there is no evidence that bumper pads or similar products that attach to crib slats or sides prevent injury in young infants and because there is the potential for suffocation, entrapment, and strangulation, these products are not recommended.^{52,53}
 - d. Infant sleep clothing that is designed to keep the infant warm without the possible hazard of head covering or entrapment can be used.
5. Pregnant women should receive regular prenatal care—There is substantial epidemiologic evidence linking a lower risk of SIDS for infants whose mothers obtain regular prenatal care.^{54–57}
 6. Avoid smoke exposure during pregnancy and after birth—Both maternal smoking during pregnancy and smoke in the infant's environment after birth are major risk factors for SIDS.
 - a. Mothers should not smoke during pregnancy or after the infant's birth.^{1,58–61}
 - b. There should be no smoking near pregnant women or infants. Encourage families to set strict rules for smoke-free homes and cars and to eliminate secondhand tobacco smoke from all places in which children and other nonsmokers spend time.^{62,63}
 - c. The risk of SIDS is particularly high when the infant bed-
 - shares with an adult smoker.^{5,6,34–36}
 7. Avoid alcohol and illicit drug use during pregnancy and after birth—There is an increased risk of SIDS with prenatal and postnatal exposure to alcohol or illicit drug use.
 - a. Mothers should avoid alcohol and illicit drugs periconceptionally and during pregnancy.^{64–70}
 - b. Parental alcohol and/or illicit drug use in combination with bed-sharing places the infant at particularly high risk of SIDS.^{7,37}
 8. Breastfeeding is recommended.
 - a. Breastfeeding is associated with a reduced risk of SIDS.^{71–73} If possible, mothers should exclusively breastfeed or feed with expressed human milk (ie, not offer any formula or other non-human milk-based supplements) for 6 months, in alignment with recommendations of the AAP.⁷⁴
 - b. The protective effect of breastfeeding increases with exclusivity.⁷³ However, any breastfeeding has been shown to be more protective against SIDS than no breastfeeding.⁷³
 9. Consider offering a pacifier at nap time and bedtime—Although the mechanism is yet unclear, studies have reported a protective effect of pacifiers on the incidence of SIDS.^{3,7,32} The protective effect persists throughout the sleep period, even if the pacifier falls out of the infant's mouth.
 - a. The pacifier should be used when placing the infant for sleep. It does not need to be reinserted once the infant falls asleep. If the infant refuses the pacifier, he or she should not be forced to take it. In those cases, parents can try to offer the pacifier again when the infant is a little older.
 - b. Because of the risk of strangulation, pacifiers should not be hung around the infant's neck. Pacifiers that attach to infant clothing should not be used with sleeping infants.
 - c. Objects such as stuffed toys, which might present a suffocation or choking risk, should not be attached to pacifiers.
 - d. For breastfed infants, delay pacifier introduction until breastfeeding has been firmly established,⁷⁴ usually by 3 to 4 weeks of age.
 - e. There is insufficient evidence that finger-sucking is protective against SIDS.
 10. Avoid overheating—Although studies have revealed an increased risk of SIDS with overheating,^{75–78} the definition of overheating in these studies varied. Therefore, it is difficult to provide specific room-temperature guidelines for avoiding overheating.
 - a. In general, infants should be dressed appropriately for the environment, with no more than 1 layer more than an adult would wear to be comfortable in that environment.
 - b. Parents and caregivers should evaluate the infant for signs of overheating, such as sweating or the infant's chest feeling hot to the touch.
 - c. Overbundling and covering of the face and head should be avoided.⁷⁹

- d. There is currently insufficient evidence to recommend the use of a fan as a SIDS risk-reduction strategy.
11. Infants should be immunized in accordance with recommendations of the AAP and the Centers for Disease Control and Prevention—There is no evidence that there is a causal relationship between immunizations and SIDS.⁸⁰ Indeed, recent evidence suggests that immunization might have a protective effect against SIDS.^{81–83} Infants should also be seen for regular well-child checks in accordance with AAP recommendations.
 12. Avoid commercial devices marketed to reduce the risk of SIDS—These devices include wedges, positioners, special mattresses, and special sleep surfaces. There is no evidence that these devices reduce the risk of SIDS or suffocation or that they are safe.
 - a. The AAP concurs with the US Food and Drug Administration and Consumer Product Safety Commission that manufacturers should not claim that a product or device protects against SIDS unless there is scientific evidence to that effect.
 13. Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS—Although cardiorespiratory monitors can be used at home to detect apnea, bradycardia, and, when pulse oximetry is used, decreases in oxyhemoglobin saturation, there is no evidence that use of such devices decreases the incidence of SIDS.^{84–87} They might be of value for selected infants but should not be used routinely.
- There is also no evidence that routine in-hospital cardiorespiratory monitoring before discharge from the hospital can identify newborn infants at risk of SIDS.
14. Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly.
 - a. Although there are no data to make specific recommendations as to how often and how long it should be undertaken, supervised, awake tummy time is recommended on a daily basis, beginning as early as possible, to promote motor development, facilitate development of the upper body muscles, and minimize the risk of positional plagiocephaly.⁸⁸
 - b. Diagnosis, management, and other prevention strategies for positional plagiocephaly, such as avoidance of excessive time in car safety seats and changing the infant's orientation in the crib, are discussed in detail in the recent AAP clinical report on positional skull deformities.⁸⁸
 15. Health care professionals, staff in newborn nurseries and neonatal intensive care nurseries, and child care providers should endorse the SIDS risk-reduction recommendations from birth.^{89–91}
 - a. Staff in NICUs should model and implement all SIDS risk-reduction recommendations as soon as the infant is clinically stable and significantly before anticipated discharge.
 - b. Staff in newborn nurseries should model and implement these recommendations beginning at birth and well before anticipated discharge.
 - c. All physicians, nurses, and other health care professionals should receive education on safe infant sleep.
 - d. All child care providers should receive education on safe infant sleep and implement safe sleep practices. It is preferable that they have written policies.
 16. Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising.

Media exposures (including movie, television, magazines, newspapers, and Web sites), manufacturer advertisements, and store displays affect individual behavior by influencing beliefs and attitudes.^{89,91} Media and advertising messages contrary to safe-sleep recommendations might create misinformation about safe sleep practices.⁹²
 17. Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep-related infant deaths, including SIDS, suffocation, and other accidental deaths. Pediatricians, family physicians, and other primary care providers should actively participate in this campaign.
 - a. Public education should continue for all who care for infants, including parents, child care providers, grandparents, foster parents, and babysitters, and should include strategies for overcoming barriers to behavior change.
 - b. The campaign should continue to have a special focus

on the black and American Indian/Alaskan Native populations because of the higher incidence of SIDS and other sleep-related infant deaths in these groups.

- c. The campaign should specifically include strategies for increasing breastfeeding while decreasing bed-sharing and eliminating tobacco smoke exposure.
 - d. These recommendations should be introduced before pregnancy and ideally in secondary school curricula for both boys and girls. The importance of maternal preconceptional health and avoidance of substance use (including alcohol and smoking) should be included in this training.
 - e. Safe-sleep messages should be reviewed, revised, and reissued at least every 5 years to address the next generation of new parents and products on the market.
18. Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of SIDS and other sleep-related infant deaths, with the ul-

timate goal of eliminating these deaths entirely.

- a. Education campaigns need to be evaluated, and innovative intervention methods need to be encouraged and funded.
- b. Continued research and improved surveillance on the etiology and pathophysiological basis of SIDS should be funded.
- c. Standardized protocols for death-scene investigations should continue to be implemented. Comprehensive autopsies that include full external and internal examination of all major organs and tissues (including the brain), complete radiographs, metabolic testing, and toxicology screening should be performed. Training about how to conduct comprehensive death-scene investigation offered to medical examiners, coroners, death-scene investigators, first responders, and law enforcement should continue, and resources for maintaining training and conduct of these investigations need to be allocated. In addition, child death reviews, with involvement of pediatricians

and other primary care providers, should be supported and funded.

- d. Improved and widespread surveillance of SIDS and SUID cases should be implemented and funded.
- e. Federal and private funding agencies should remain committed to all aspects of the aforementioned research.

LEAD AUTHOR

Rachel Y. Moon, MD

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME, 2010–2011

Rachel Y. Moon, MD, Chairperson
Robert A. Darnall, MD
Michael H. Goodstein, MD
Fern R. Hauck, MD, MS

CONSULTANTS

Marian Willinger, PhD – *Eunice Kennedy Shriver National Institute for Child Health and Human Development*
Carrie K. Shapiro-Mendoza, PhD, MPH – *Centers for Disease Control and Prevention*

STAFF

James Couto, MA

ACKNOWLEDGMENTS

The task force acknowledges the contributions provided by others to the collection and interpretation of data examined in preparation of this report. The task force is particularly grateful for the report submitted by Dr Suad Wanna-Nakamura (Consumer Product Safety Commission).

REFERENCES

1. Willinger M, James LS, Catz C. Defining the sudden infant death syndrome (SIDS): deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatr Pathol*. 1991; 11(5):677–684
2. Moon RY, American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. Technical report—SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*. 2011;128(5). Available at: www.pediatrics.org/cgi/content/full/128/5/e1461
3. Hauck FR, Herman SM, Donovan M, et al. Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study. *Pediatrics*. 2003;111(5 pt 2): 1207–1214
4. Li DK, Petitti DB, Willinger M, et al. Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *Am J Epidemiol*. 2003;157(5):446–455
5. Blair PS, Fleming PJ, Smith IJ, et al. Babies sleeping with parents: case-control study of factors influencing the risk of the sudden infant death syndrome. CESDI SUDI Research Group. *BMJ*. 1999;319(7223):1457–1462
6. Fleming PJ, Blair PS, Bacon C, et al. Environment of infants during sleep and risk of the sudden infant death syndrome: results of 1993–5 case-control study for confidential inquiry into stillbirths and deaths in infancy. Confidential Enquiry Into Stillbirths and Deaths Regional Coordinators and Researchers. *BMJ*. 1996; 313(7051):191–195
7. Carpenter RG, Irgens LM, Blair PS, et al. Sudden unexplained infant death in 20 regions in Europe: case control study. *Lancet*. 2004; 363(9404):185–191
8. Malloy MH. Trends in postneonatal aspiration deaths and reclassification of sudden infant death syndrome: impact of the “Back to Sleep” program. *Pediatrics*. 2002;109(4): 661–665

9. Tablizo MA, Jacinto P, Parsley D, Chen ML, Ramanathan R, Keens TG. Supine sleeping position does not cause clinical aspiration in neonates in hospital newborn nurseries. *Arch Pediatr Adolesc Med.* 2007;161(5):507–510
10. Vandenplas Y, Rudolph CD, Di Lorenzo C, et al. Pediatric gastroesophageal reflux clinical practice guidelines: joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN). *J Pediatr Gastroenterol Nutr.* 2009;49(4):498–547
11. Tobin JM, McCloud P, Cameron DJ. Posture and gastro-oesophageal reflux: a case for left lateral positioning. *Arch Dis Child.* 1997;76(3):254–258
12. Malloy MH, Hoffman HJ. Prematurity, sudden infant death syndrome, and age of death. *Pediatrics.* 1995;96(3 pt 1):464–471
13. Sowter B, Doyle LW, Morley CJ, Altmann A, Halliday J. Is sudden infant death syndrome still more common in very low birthweight infants in the 1990s? *Med J Aust.* 1999;171(8):411–413
14. Oyen N, Markestad T, Skjaerven 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
15. American Academy of Pediatrics, Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. *Pediatrics.* 2008;122(5):1119–1126
16. US Consumer Product Safety Commission. *Crib safety tips: use your crib safely.* Washington, DC: US Consumer Product Safety Commission. CPSC Document No. 5030. Available at: <http://www.cpsc.gov/cpscpub/pubs/5030.html>. Accessed September 30, 2011
17. Ostfeld BM, Perl H, Esposito L, et al. Sleep environment, positional, lifestyle, and demographic characteristics associated with bed sharing in sudden infant death syndrome cases: a population-based study. *Pediatrics.* 2006;118(5):2051–2059
18. Scheers NJ, Rutherford GW, Kemp JS. Where should infants sleep? A comparison of risk for suffocation of infants sleeping in cribs, adult beds, and other sleeping locations. *Pediatrics.* 2003;112(4):883–889
19. Bass JL, Bull M. Oxygen desaturation in term infants in car safety seats. *Pediatrics.* 2002;110(2 pt 1):401–402
20. Kornhauser Cerar L, Scirica CV, Štucin Gantar I, Osredkar D, Neubauer D, Kinane TB. A comparison of respiratory patterns in healthy term infants placed in car safety seats and beds. *Pediatrics.* 2009;124(3). Available at: www.pediatrics.org/cgi/content/full/124/3/e396
21. Côté A, Bairam A, Deschesne M, Hatzakis G. Sudden infant deaths in sitting devices. *Arch Dis Child.* 2008;93(5):384–389
22. Merchant JR, Worwa C, Porter S, Coleman JM, deRegnier RA. Respiratory instability of term and near-term healthy newborn infants in car safety seats. *Pediatrics.* 2001;108(3):647–652
23. Willett LD, Leuschen MP, Nelson LS, Nelson RM Jr. Risk of hypoventilation in premature infants in car seats. *J Pediatr.* 1986;109(2):245–248
24. US Consumer Product Safety Commission. *Infant Deaths Prompt CPSC Warning About Sling Carriers for Babies* [press release]. Washington, DC: US Consumer Product Safety Commission; 2010. Available at: www.cpsc.gov/cpscpub/prerel/prhtml10/10165.html. Accessed August 27, 2011
25. Desapriya EB, Joshi P, Subzwari S, Nolan M. Infant injuries from child restraint safety seat misuse at British Columbia Children's Hospital. *Pediatr Int.* 2008;50(5):674–678
26. Graham CJ, Kittredge D, Stuenkel JH. Injuries associated with child safety seat misuse. *Pediatr Emerg Care.* 1992;8(6):351–353
27. Parikh SN, Wilson L. Hazardous use of car seats outside the car in the United States, 2003–2007. *Pediatrics.* 2010;126(2):352–357
28. Pollack-Nelson C. Fall and suffocation injuries associated with in-home use of car seats and baby carriers. *Pediatr Emerg Care.* 2000;16(2):77–79
29. Wickham T, Abrahamson E. Head injuries in infants: the risks of bouncy chairs and car seats. *Arch Dis Child.* 2002;86(3):168–169
30. Mitchell EA, Thompson JMD. Co-sleeping increases the risk of SIDS, but sleeping in the parents' bedroom lowers it. In: Rognum TO, ed. *Sudden Infant Death Syndrome: New Trends in the Nineties.* Oslo, Norway: Scandinavian University Press; 1995:266–269
31. Tappin D, Ecob R, Brooke H. Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: a case control study. *J Pediatr.* 2005;147(1):32–37
32. McGarvey C, McDonnell M, Chong A, O'Regan M, Matthews T. Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland. *Arch Dis Child.* 2003;88(12):1058–1064
33. McGarvey C, McDonnell M, Hamilton K, O'Regan M, Matthews T. An 8 year study of risk factors for SIDS: bed-sharing vs. non bed-sharing. *Arch Dis Child.* 2006;91(4):318–323
34. Vennemann M, Hense HW, Bajonowski T, et al. Bed sharing and the risk of SIDS: can we resolve the debate? *J Pediatr.* In press; ePub ahead of print August 21, 2011
35. Arnestad M, Andersen M, Vege A, Rognum TO. Changes in the epidemiological pattern of sudden infant death syndrome in south-east Norway, 1984–1998: implications for future prevention and research. *Arch Dis Child.* 2001;85(2):108–115
36. Scragg R, Mitchell EA, Taylor BJ, et al. Bed sharing, smoking, and alcohol in the sudden infant death syndrome. New Zealand Cot Death Study Group. *BMJ.* 1993;307(6915):1312–1318
37. Blair PS, Sidebotham P, Evason-Coombe C, Edmonds M, Heckstall-Smith EM, Fleming P. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ.* 2009;339:b3666
38. Fu LY, Hauck FR, Moon R. Bed sharing among black infants and sudden infant death syndrome: interactions with other known risk factors. *Acad Pediatr.* 2010;10(6):376–382
39. Tomashek KM, Wallman C; American Academy of Pediatrics, Committee on Fetus and Newborn. Cobedding twins and higher-order multiples in a hospital setting [published correction appears in *Pediatrics.* 2008;121(1):227]. *Pediatrics.* 2007;120(6):1359–1366
40. Chiodini BA, Thach BT. Impaired ventilation in infants sleeping facedown: potential significance for sudden infant death syndrome. *J Pediatr.* 1993;123(5):686–692
41. Kanetake J, Aoki Y, Funayama M. Evaluation of rebreathing potential on bedding for infant use. *Pediatr Int.* 2003;45(3):284–289
42. Kemp JS, Linne M, White DK, Arfken CL. Softness and potential to cause rebreathing: differences in bedding used by infants at high and low risk for sudden infant death syndrome. *J Pediatr.* 1998;132(2):234–239
43. Kemp JS, Nelson VE, Thach BT. Physical properties of bedding that may increase risk of sudden infant death syndrome in prone-sleeping infants. *Pediatr Res.* 1994;36(1 pt 1):7–11
44. Patel AL, Harris K, Thach BT. Inspired CO₂ and O₂ in sleeping infants rebreathing from bedding: relevance for sudden infant death syndrome. *J Appl Physiol.* 2001;91(6):2537–2545
45. Sakai J, Kanetake J, Takahashi S, Kanawaku Y, Funayama M. Gas dispersal potential of bedding as a cause for sudden infant death. *Forensic Sci Int.* 2008;180(2–3):93–97
46. Brooke H, Gibson A, Tappin D, Brown H. Case-control study of sudden infant death syn-

- drome in Scotland, 1992–5. *BMJ*. 1997; 314(7093):1516–1520
47. L'Hoir MP, Engelberts AC, van Well GTJ, et al. Risk and preventive factors for cot death in the Netherlands, a low-incidence country. *Eur J Pediatr*. 1998;157(8):681–688
 48. Markestad T, Skadberg B, Hordvik E, Morild I, Irgens L. Sleeping position and sudden infant death syndrome (SIDS): effect of an intervention programme to avoid prone sleeping. *Acta Paediatr*. 1995;84(4):375–378
 49. Ponsonby AL, Dwyer T, Couper D, Cochrane J. Association between use of a quilt and sudden infant death syndrome: case-control study. *BMJ*. 1998;316(7126):195–196
 50. Beal SM, Byard RW. Accidental death or sudden infant death syndrome? *J Paediatr Child Health*. 1995;31(4):269–271
 51. Wilson CA, Taylor BJ, Laing RM, Williams SM, Mitchell EA. Clothing and bedding and its relevance to sudden infant death syndrome: further results from the New Zealand Cot Death Study. *J Paediatr Child Health*. 1994;30(6):506–512
 52. Thach BT, Rutherford GW, Harris K. Deaths and injuries attributed to infant crib bumper pads. *J Pediatr*. 2007;151(3):271–274
 53. Yeh ES, Rochette LM, McKenzie LB, Smith GA. Injuries associated with cribs, playpens, and bassinets among young children in the US, 1990–2008. *Pediatrics*. 2011;127(3):479–486
 54. Getahun D, Amre D, Rhoads GG, Demissie K. Maternal and obstetric risk factors for sudden infant death syndrome in the United States. *Obstet Gynecol*. 2004;103(4):646–652
 55. Kraus JF, Greenland S, Bulterys M. Risk factors for sudden infant death syndrome in the US Collaborative Perinatal Project. *Int J Epidemiol*. 1989;18(1):113–120
 56. Paris C, Remler R, Daling JR. Risk factors for sudden infant death syndrome: changes associated with sleep position recommendations. *J Pediatr*. 2001;139(6):771–777
 57. Stewart A, Williams S, Mitchell E, Taylor BJ, Ford R, Allen EM. Antenatal and intrapartum factors associated with sudden infant death syndrome in the New Zealand Cot Death study. *J Paediatr Child Health*. 1995;31(5):473–478
 58. MacDorman MF, Cnattingius S, Hoffman HJ, Kramer MS, Haglund B. Sudden infant death syndrome and smoking in the United States and Sweden. *Am J Epidemiol*. 1997;146(3):249–257
 59. Schoendorf KC, Kiely JL. Relationship of sudden infant death syndrome to maternal smoking during and after pregnancy. *Pediatrics*. 1992;90(6):905–908
 60. Malloy MH, Kleinman JC, Land GH, Schramm WF. The association of maternal smoking with age and cause of infant death. *Am J Epidemiol*. 1988;128(1):46–55
 61. Haglund B, Cnattingius S. Cigarette smoking as a risk factor for sudden infant death syndrome: a population-based study. *Am J Public Health*. 1990;80(1):29–32
 62. American Academy of Pediatrics, Committee on Environmental Health; Committee on Substance Abuse; Committee on Adolescence; Committee on Native American Child. Policy statement—tobacco use: a pediatric disease [published correction appears in *Pediatrics*. 2010;125(4):861]. *Pediatrics*. 2009;124(5):1474–1487
 63. Best D; American Academy of Pediatrics, Committee on Environmental Health; Committee on Native American Child Health; Committee on Adolescence. Technical report—secondhand and prenatal tobacco smoke exposure. *Pediatrics*. 2009;124(5). Available at: www.pediatrics.org/cgi/content/full/124/5/e1017
 64. Rajegowda BK, Kandall SR, Falciglia H. Sudden unexpected death in infants of narcotic-dependent mothers. *Early Hum Dev*. 1978;2(3):219–225
 65. Chavez CJ, Ostrea EM Jr, Stryker JC, Smialek Z. Sudden infant death syndrome among infants of drug-dependent mothers. *J Pediatr*. 1979;95(3):407–409
 66. Durand DJ, Espinoza AM, Nickerson BG. Association between prenatal cocaine exposure and sudden infant death syndrome. *J Pediatr*. 1990;117(6):909–911
 67. Ward SL, Bautista D, Chan L, et al. Sudden infant death syndrome in infants of substance-abusing mothers. *J Pediatr*. 1990;117(6):876–881
 68. Rosen TS, Johnson HL. Drug-addicted mothers, their infants, and SIDS. *Ann NY Acad Sci*. 1988;533:89–95
 69. Kandall SR, Gaines J, Habel L, Davidson G, Jessop D. Relationship of maternal substance abuse to subsequent sudden infant death syndrome in offspring. *J Pediatr*. 1993;123(1):120–126
 70. Fares I, McCulloch KM, Raju TN. Intrauterine cocaine exposure and the risk for sudden infant death syndrome: a meta-analysis. *J Perinatol*. 1997;17(3):179–182
 71. Ip S, Chung M, Raman G, Trikalinos TA, Lau J. A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries. *Breastfeed Med*. 2009;4(suppl 1):S17–S30
 72. Vennemann MM, Bajonowski T, Brinkmann B, et al; GeSID Study Group. Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics*. 2009;123. Available at: www.pediatrics.org/cgi/content/full/123/3/e406
 73. Hauck FR, Thompson J, Tanabe KO, Moon RY, Vennemann M. Breastfeeding and reduced risk of sudden infant death syndrome: a meta-analysis. *Pediatrics*. 2011;128(1):103–110
 74. American Academy of Pediatrics, Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 2005;115(2):496–506
 75. Fleming P, Gilbert R, Azaz Y, et al. Interaction between bedding and sleeping position in the sudden infant death syndrome: a population based case-control study. *BMJ*. 1990;301(6743):85–89
 76. Ponsonby AL, Dwyer T, Gibbons LE, Cochrane JA, Jones ME, McCall MJ. Thermal environment and sudden infant death syndrome: case-control study. *BMJ*. 1992;304(6822):277–282
 77. Ponsonby AL, Dwyer T, Gibbons LE, Cochrane JA, Wang YG. Factors potentiating the risk of sudden infant death syndrome associated with the prone position. *N Engl J Med*. 1993;329(6):377–382
 78. Iyasu S, Randall LL, Welty TK, et al. Risk factors for sudden infant death syndrome among northern plains Indians. *JAMA*. 2002;288(21):2717–2723
 79. Blair PS, Mitchell EA, Heckstall-Smith EM, Fleming PJ. Head covering: a major modifiable risk factor for sudden infant death syndrome: a systematic review. *Arch Dis Child*. 2008;93(9):778–783
 80. Stratton K, Almario DA, Wizemann TM, McCormick MC, eds; Immunization Safety Review Committee. *Immunization Safety Review: Vaccinations and Sudden Unexpected Death in Infancy*. Washington, DC: National Academies Press; 2003
 81. Mitchell EA, Stewart AW, Clements M, Ford RPK. Immunisation and the sudden infant death syndrome. New Zealand Cot Death Study Group. *Arch Dis Child*. 1995;73(6):498–501
 82. Jonville-Béra AP, Autret-Leca E, Barbeillon F, Paris-Llado J; French Reference Centers for SIDS. Sudden unexpected death in infants under 3 months of age and vaccination status: a case-control study. *Br J Clin Pharmacol*. 2001;51(3):271–276
 83. Fleming PJ, Blair PS, Platt MW, Tripp J, Smith IJ, Golding J. The UK accelerated immunisation programme and sudden unexpected death in infancy: case-control study. *BMJ*. 2001;322(7290):822
 84. Hodgman JE, Hoppenbrouwers T. Home monitoring for the sudden infant death

- syndrome: the case against. *Ann NY Acad Sci.* 1988;533:164–175
85. Ward SL, Keens TG, Chan LS, et al. Sudden infant death syndrome in infants evaluated by apnea programs in California. *Pediatrics.* 1986;77(4):451–458
 86. Monod N, Plouin P, Sternberg B, et al. Are polygraphic and cardiopneumographic respiratory patterns useful tools for predicting the risk for sudden infant death syndrome? A 10-year study. *Biol Neonate.* 1986; 50(3):147–153
 87. Ramanathan R, Corwin MJ, Hunt CE, et al. Cardiorespiratory events recorded on home monitors: comparison of healthy infants with those at increased risk for SIDS. *JAMA.* 2001;285(17):2199–2207
 88. Laughlin J, Luerssen TG, Dias MS; American Academy of Pediatrics, Committee on Practice and Ambulatory Medicine, Section on Neurological Surgery. Clinical report—prevention and management of positional skull deformities in infants. *Pediatrics.* 2011; In press
 89. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ. Factors associated with caregivers' choice of infant sleep position, 1994–1998: the National Infant Sleep Position Study. *JAMA.* 2000;283(16):2135–2142
 90. Brenner R, Simons-Morton BG, Bhaskar B, et al. Prevalence and predictors of the prone sleep position among inner-city infants. *JAMA.* 1998;280(4):341–346
 91. Von Kohorn I, Corwin MJ, Rybin DV, Heeren TG, Lister G, Colson ER. Influence of prior advice and beliefs of mothers on infant sleep position. *Arch Pediatr Adolesc Med.* 2010;164(4):363–369
 92. Joyner BL, Gill-Bailey C, Moon RY. Infant sleep environments depicted in magazines targeted to women of childbearing age. *Pediatrics.* 2009;124(3). Available at: www.pediatrics.org/cgi/content/full/124/3/e416

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

Task Force on Sudden Infant Death Syndrome

Pediatrics 2011;128:e1341; originally published online October 17, 2011;

DOI: 10.1542/peds.2011-2285

The online version of this article, along with updated information and services, is
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/128/5/e1341.full.html>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2011 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

Task Force on Sudden Infant Death Syndrome

Pediatrics 2011;128:e1341; originally published online October 17, 2011;

DOI: 10.1542/peds.2011-2285

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/128/5/e1341.full.html>

References

This article cites 301 articles, 103 of which can be accessed free at:
<http://pediatrics.aappublications.org/content/128/5/e1341.full.html#ref-list-1>

Citations

This article has been cited by 25 HighWire-hosted articles:
<http://pediatrics.aappublications.org/content/128/5/e1341.full.html#related-urls>

Post-Publication Peer Reviews (P³Rs)

2 P³Rs have been posted to this article
<http://pediatrics.aappublications.org/cgi/eletters/128/5/e1341>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Task Force on Sudden Infant Death Syndrome
http://pediatrics.aappublications.org/cgi/collection/task_force_on_sudden_infant_death_syndrome
Pulmonology
http://pediatrics.aappublications.org/cgi/collection/pulmonology_sub
Respiratory Tract
http://pediatrics.aappublications.org/cgi/collection/respiratory_tract_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://pediatrics.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://pediatrics.aappublications.org/site/misc/reprints.xhtml>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2011 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™





TECHNICAL REPORT

SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME

KEY WORDS

SIDS, sudden infant death, infant mortality, sleep position, bed-sharing, tobacco, pacifier, immunization, bedding, sleep surface

ABBREVIATIONS

CPSC—Consumer Product Safety Commission

AAP—American Academy of Pediatrics

SIDS—sudden infant death syndrome

SUID—sudden unexpected infant death

ICD—*International Classification of Diseases*

ASSB—accidental suffocation and strangulation in bed

5-HT—5-hydroxytryptamine

OR—odds ratio

CI—confidence interval

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

www.pediatrics.org/cgi/doi/10.1542/peds.2011-2285

doi:10.1542/peds.2011-2285

All technical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2011 by the American Academy of Pediatrics

abstract

FREE

Despite a major decrease in the incidence of sudden infant death syndrome (SIDS) since the American Academy of Pediatrics (AAP) released its recommendation in 1992 that infants be placed for sleep in a non-prone position, this decline has plateaued in recent years. Concurrently, other causes of sudden unexpected infant death occurring during sleep (sleep-related deaths), including suffocation, asphyxia, and entrapment, and ill-defined or unspecified causes of death have increased in incidence, particularly since the AAP published its last statement on SIDS in 2005. It has become increasingly important to address these other causes of sleep-related infant death. Many of the modifiable and nonmodifiable risk factors for SIDS and suffocation are strikingly similar. The AAP, therefore, is expanding its recommendations from being only SIDS-focused to focusing on a safe sleep environment that can reduce the risk of all sleep-related infant deaths including SIDS. The recommendations described in this report include supine positioning, use of a firm sleep surface, breastfeeding, room-sharing without bed-sharing, routine immunization, consideration of a pacifier, and avoidance of soft bedding, overheating, and exposure to tobacco smoke, alcohol, and illicit drugs. The rationale for these recommendations is discussed in detail in this technical report. The recommendations are published in the accompanying “Policy Statement—Sudden Infant Death Syndrome and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment,” which is included in this issue (www.pediatrics.org/cgi/doi/10.1542/peds.2011-2220). *Pediatrics* 2011;128:e1341–e1367

METHODOLOGY

Literature searches using PubMed were conducted for each of the topics in this technical report and concentrated on articles published since 2005 (when the last policy statement¹ was published). In addition, to provide additional information regarding sleep-environment hazards, a white paper was solicited from the US Consumer Product Safety Commission (CPSC).² Strength of evidence for recommendations³ was determined by the task force members. Draft versions of the policy statement⁴ and technical report were submitted to relevant committees and sections of the American Academy of Pediatrics (AAP) for review and comment. After the appropriate revisions were made, a

final version was submitted to the AAP Executive Committee and Board of Directors for final approval.

SUDDEN INFANT DEATH SYNDROME AND SUDDEN UNEXPECTED INFANT DEATH: DEFINITIONS AND DIAGNOSTIC ISSUES

Sudden Infant Death Syndrome and Sudden Unexpected Infant Death

Sudden infant death syndrome (SIDS) is a cause assigned to infant deaths that cannot be explained after a thorough case investigation that includes a scene investigation, autopsy, and review of the clinical history.⁵ Sudden unexpected infant death (SUID), also known as sudden unexpected death in infancy (SUDI), is a term used to describe any sudden and unexpected death, whether explained or unexplained (including SIDS), that occurs during infancy. After case investigation, SUIDs can be attributed to suffocation, asphyxia, entrapment, infection, ingestions, metabolic diseases, and trauma (accidental or nonaccidental). The distinction between SIDS and other SUIDs, particularly those that occur during an observed or unobserved sleep period (sleep-related infant deaths), such as accidental suffocation, is challenging and cannot usually be determined by autopsy alone. Scene investigation and review of the clinical history are also required. A few deaths that are diagnosed as SIDS are found, after further specialized investigations, to be attributable to metabolic disorders or arrhythmia-associated cardiac channelopathies.

Although standardized guidelines for conducting thorough case investigations have been developed,⁶ these guidelines have not been uniformly adopted across the more than 2000 US medical examiner and coroner jurisdictions.⁷ Information from emergency responders, scene investigators, and

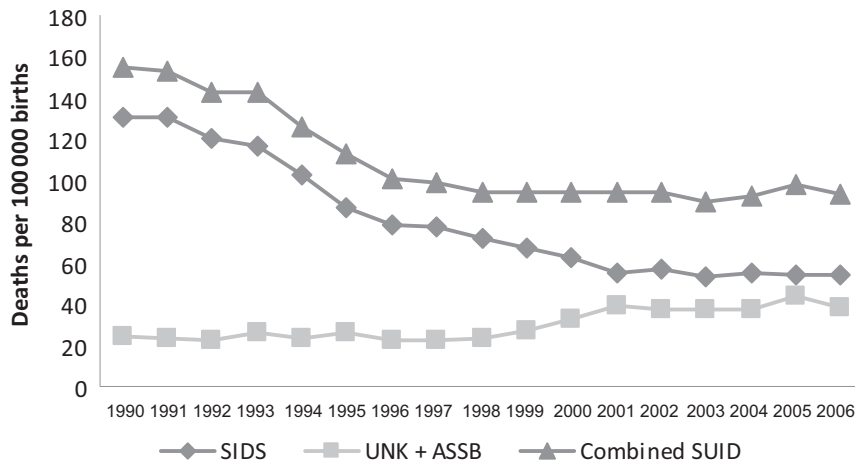
caregiver interviews can provide additional evidence to assist death certifiers (ie, medical examiners and coroners) in accurately determining the cause of death. However, death certifiers represent a diverse group with varying levels of skills and education as well as diagnostic preferences. Recently, much attention has been focused on reporting differences among death certifiers. At one extreme, some certifiers have abandoned using SIDS as a cause-of-death explanation.⁷ At the other extreme, some certifiers will not classify a death as suffocation in the absence of a pathologic marker of asphyxia at autopsy (ie, pathologic findings diagnostic of oronasal occlusion or chest compression⁸), even with strong evidence from the scene investigation that suggests a probable accidental suffocation.

US Trends in SIDS, Other SUIDs, and Postneonatal Mortality

To monitor trends in SIDS and other SUIDs nationally, the United States classifies diseases and injuries according to the *International Classification of Diseases* (ICD) diagnostic codes. This classification system is designed to promote national and international comparability in the assignment of cause-of-death determinations; however, this system might not provide the optimal precision in classification desired by clinicians and researchers. In the United States, the National Center for Health Statistics assigns a SIDS diagnostic code (ICD-10 R95) if the death is classified with terminology such as SIDS (including presumed, probable, or consistent with SIDS), sudden infant death, sudden unexplained death in infancy, sudden unexpected death in infancy, or sudden unexplained infant death on the certified death certificate. A death will be coded as “other ill-defined and unspecified causes of mortality” (ICD-10 R99) if the cause of the death is reported as

unknown or unspecified. A death is coded as “accidental suffocation and strangulation in bed” (ASSB) (ICD-10 W75) when the terms “asphyxia,” “asphyxiated,” “asphyxiation,” “strangled,” “strangled,” “strangulation,” “suffocated,” or “suffocation” are reported, along with the terms “bed” or “crib.” This code also includes deaths while sleeping on couches and armchairs.

Although SIDS was defined somewhat loosely until the mid-1980s, there was minimal change in the incidence of SIDS in the United States until the early 1990s. In 1992, in response to epidemiologic reports from Europe and Australia, the AAP recommended that infants be placed for sleep in a nonprone position as a strategy for reducing the risk of SIDS.⁹ The “Back to Sleep” campaign was initiated in 1994 under the leadership of the National Institute of Child Health and Human Development as a joint effort of the Maternal and Child Health Bureau of the Health Resources and Services Administration, the AAP, the SIDS Alliance (now First Candle), and the Association of SIDS and Infant Mortality Programs.¹⁰ The Eunice Kennedy Shriver National Institute of Child Health and Human Development began conducting national surveys of infant care practices to evaluate the implementation of the AAP recommendation. Between 1992 and 2001, the SIDS rate declined, and the most dramatic declines occurred in the years immediately after the first nonprone recommendations, consistent with the steady increase in the prevalence of supine sleeping (Fig 1).¹¹ The US SIDS rate declined from 120 deaths per 100 000 live births in 1992 to 56 deaths per 100 000 live births in 2001, representing a decrease of 53% over 10 years. However, from 2001 to 2006 (the latest year from which data are available), the rate has remained constant (Fig 1). In 2006, 2327 infants

**FIGURE 1**

Trends in SIDS and other SUID mortality: United States 1990–2006. UNK indicates ill-defined or unspecified deaths.

died from SIDS. Although SIDS rates have declined by more than 50% since the early 1990s, SIDS remains the third-leading cause of infant mortality and the leading cause of postneonatal mortality (28 days to 1 year of age).

The all-cause postneonatal death rate has followed a trend similar to the SIDS rate: there was a 29% decline from 1992 to 2001 (from 314 to 231 per 100 000 live births). From 2001 until 2006, postneonatal mortality rates have also remained fairly unchanged (from 231 to 224 per 100 000 live births); the average decline is 3%.¹²

Several recent studies have revealed that some deaths previously classified as SIDS are now being classified as other causes of infant death (eg, accidental suffocation and other ill-defined or unspecified causes).^{13,14} Since 1999, much of the decline in SIDS rates might be explained by increasing rates of these other causes of SUID, particularly over the years 1999–2001.^{13,15} A notable change is in deaths attributable to ASSB. Between 1984 and 2004, ASSB infant mortality rates more than quadrupled, from 2.8 to 12.5 deaths per 100 000 live births,¹⁵ which represents 513 infant deaths attributed to ASSB in 2004 compared with 103 in 1984.

Sleep Position

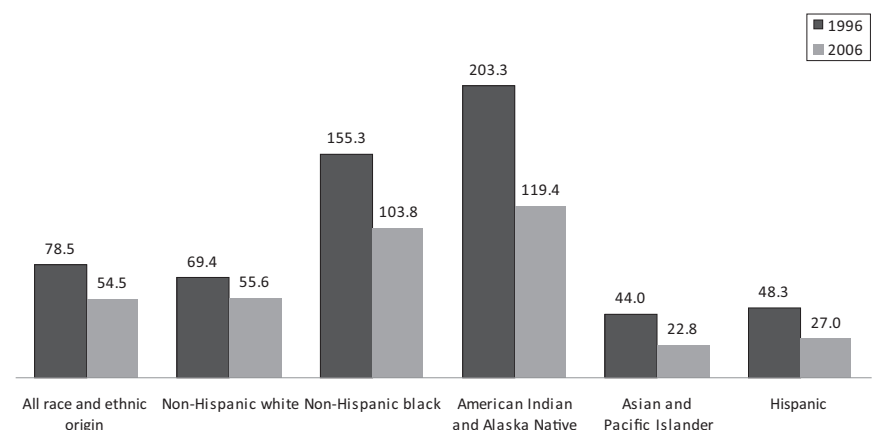
The apparent leveling of the previously declining SIDS rate is occurring coincident with a slowing in the reduction of the prevalence of prone positioning. The prevalence of supine sleep positioning, as assessed from an ongoing national sampling, increased from 13% in 1992 to 72% in 2001. From 2001 until 2010, the prevalence of supine sleep positioning has been fairly stagnant (prevalence in 2010: 75%).¹¹

The 1998 and 2005 AAP policy statements and the Back to Sleep campaign not only addressed the importance of back sleeping but also provided recommendations for other infant care

practices that may reduce the risk of SIDS and other sleep-related infant deaths.^{1,9} Unfortunately, the ability to measure the prevalence of these other risk factors is limited by lack of data. Death certificates are useful for monitoring trends in SIDS mortality, but the circumstances and events that lead to death are not captured in vital statistics data.¹⁶ The Centers for Disease Control and Prevention recently began to pilot a SUID case registry that will provide supplemental surveillance information about the sleep environment at the time of death, infant health history, and the comprehensiveness of the death scene investigation and autopsy. These factors will better describe the circumstances surrounding SIDS and other sleep-related infant deaths and assist researchers in determining the similarities and differences between these deaths.

Racial and Ethnic Disparities

SIDS mortality rates, similar to other causes of infant mortality, have notable racial and ethnic disparities (Fig 2).¹⁷ Despite the decline in SIDS in all races and ethnicities, the rate of SIDS in non-Hispanic black (99 per 100 000 live births) and American Indian/Alaska Native (112 per 100 000 live births) infants was double that of non-Hispanic white infants (55 per 100 000)

**FIGURE 2**

Comparison of US rates of SIDS according to maternal race and ethnic origin in 1996 and 2006.

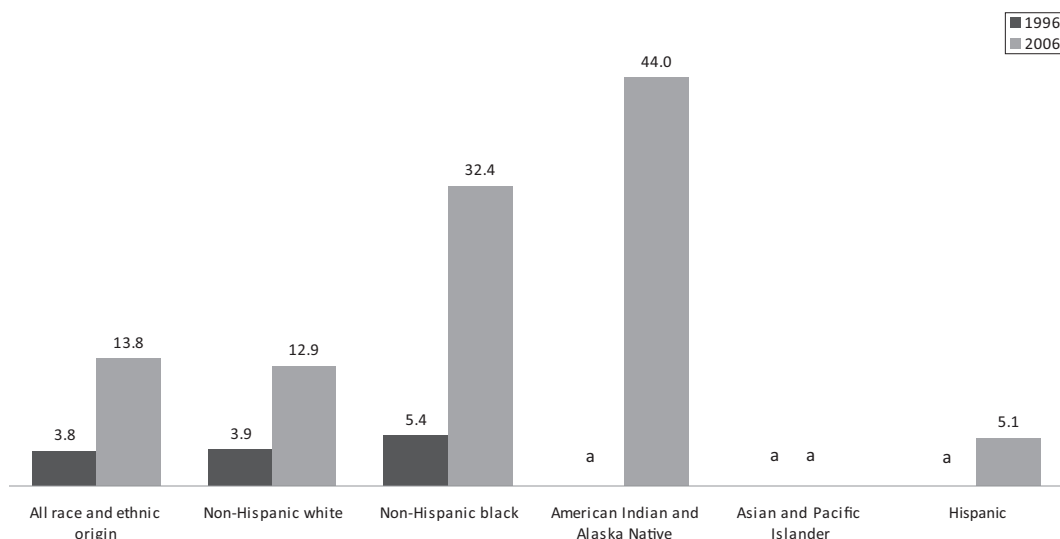


FIGURE 3

Comparison of US rates of death resulting from ASSB according to maternal race and ethnic origin in 1996 and 2006. ^a The figure does not meet standards of reliability or precision on the basis of fewer than 20 deaths in the numerator.

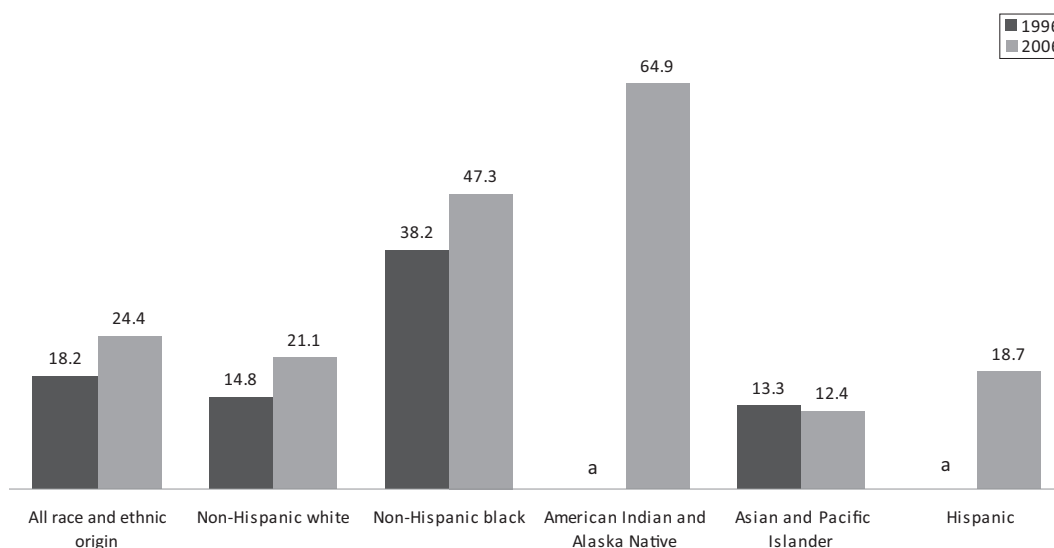


FIGURE 4

Comparison of US rates of cause ill-defined or unspecified death according to maternal race and ethnic origin in 1996 and 2006. ^a The figure does not meet standards of reliability or precision on the basis of fewer than 20 deaths in the numerator.

live births) in 2005 (Fig 2). SIDS rates for Asian/Pacific Islander and Hispanic infants were nearly half the rate for non-Hispanic white infants. Furthermore, similar racial and ethnic disparities have been seen with deaths attributed to both ASSB (Fig 3) and ill-defined or unspecified deaths (Fig 4). Differences in the prevalence of supine positioning and other sleep-environment conditions among ra-

cial and ethnic populations might contribute to these disparities.¹⁷ The prevalence of supine positioning in 2010 among white infants was 75%, compared with 53% among black infants (Fig 5). The prevalence of supine sleep positioning among Hispanic and Asian infants was 73% and 80%, respectively.¹¹ Parent-infant bed-sharing^{18–20} and use of soft bedding are also more common among black families

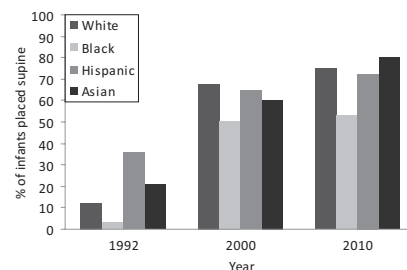


FIGURE 5

Prevalence of supine sleep positioning according to maternal race and ethnic origin, 1992–2010. Data source: National Infant Sleep Position Study.¹¹

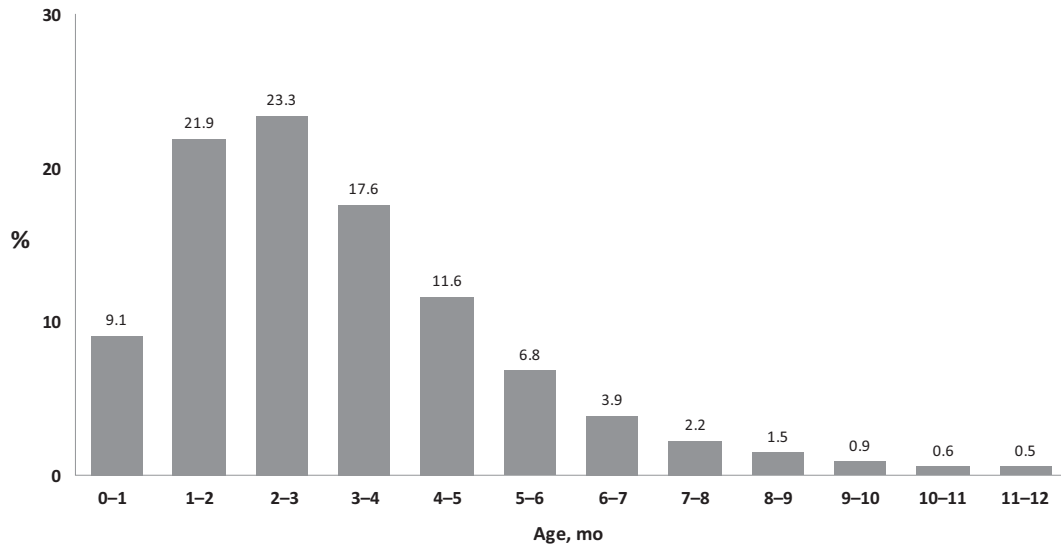


FIGURE 6
Percent distribution of SIDS deaths according to age at death: United States, 2004–2006.

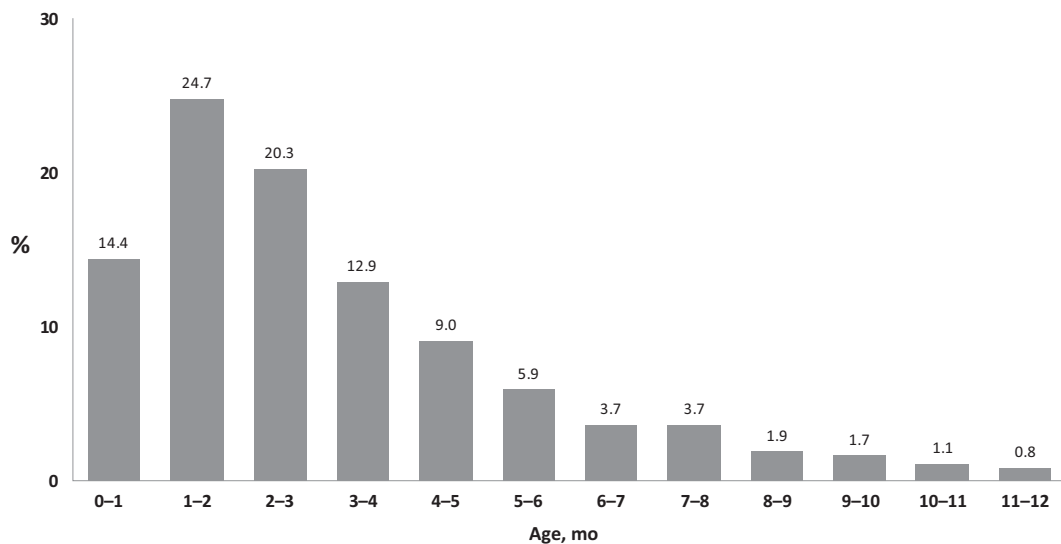


FIGURE 7
Percent distribution of deaths caused by ASSB according to age at death: United States, 2004–2006.

than among other racial/ethnic groups.^{21,22} Additional work in promoting appropriate infant sleep position and sleep-environment conditions is necessary to resume the previous rate of decline (observed during the 1990s) for SIDS and all-cause postneonatal mortality.

Age at Death

Ninety percent of SIDS cases occur before an infant reaches the age of 6 months. The rate of SIDS peaks be-

tween 1 and 4 months of age. Although SIDS was once considered a rare event during the first month of life, in 2004–2006, nearly 10% of cases coded as SIDS occurred during the first month. SIDS is uncommon after 8 months of age (Fig 6).¹⁴ A similar age distribution is seen for ASSB (Fig 7).

Seasonality of SIDS

A pattern in seasonality of SIDS is no longer apparent. SIDS deaths have historically been observed more fre-

quently in the colder months, and the fewest SIDS deaths occurred in the warmest months.²³ In 1992, SIDS rates had an average seasonal change of 16.3%, compared with only 7.6% in 1999,²⁴ which is consistent with reports from other countries.²⁵

PATHOPHYSIOLOGY AND GENETICS OF SIDS

A working model of SIDS pathogenesis includes a convergence of exogenous triggers or “stressors” (eg, prone

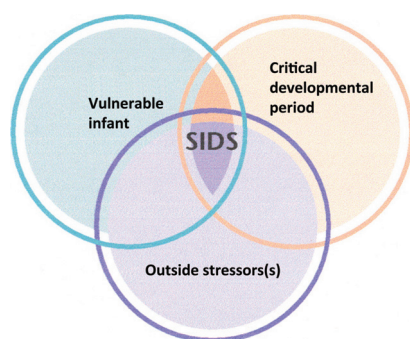


FIGURE 8
Triple-risk model for SIDS.²⁶

sleep position, overbundling, airway obstruction), a critical period of development, and dysfunctional and/or immature cardiorespiratory and/or arousal systems (intrinsic vulnerability) that lead to a failure of protective responses (see Fig 8).²⁶ Convergence of these factors ultimately results in a combination of progressive asphyxia, bradycardia, hypotension, metabolic acidosis, and ineffectual gasping, leading to death.²⁷ The mechanisms responsible for dysfunctional cardiorespiratory and/or arousal protective responses remain unclear but might be the result of in utero environmental conditions and/or genetically determined maldevelopment or delay in maturation. Infants who die from SIDS are more likely to be born at low birth weight or growth restricted, which suggests an adverse intrauterine environment. Other adverse in utero environmental conditions include exposure to nicotine or other components of cigarette smoke and alcohol.

Recent studies have explored how prenatal exposure to cigarette smoke may result in an increased risk of SIDS. In animal models, exposure to cigarette smoke or nicotine during fetal development alters the expression of the nicotinic acetylcholine receptor in areas of the brainstem important for autonomic function,²⁸ alters the neuronal excitability of neurons in the nucleus tractus solitarius (a brainstem region

important for sensory integration),²⁹ and alters fetal autonomic activity and medullary neurotransmitter receptors.³⁰ In human infants, there are strong associations between nicotinic acetylcholine receptor and serotonin receptors in the brainstem during development.³¹ Prenatal exposure to tobacco smoke attenuates recovery from hypoxia in preterm infants,³² decreases heart rate variability in preterm³³ and term³⁴ infants, and abolishes the normal relationship between heart rate and gestational age at birth.³⁵ Moreover, infants of smoking mothers exhibit impaired arousal patterns to trigeminal stimulation in proportion to urinary cotinine levels.³⁵ It is important to note also that prenatal exposure to tobacco smoke alters the normal programming of cardiovascular reflexes such that there is a greater-than-expected increase in blood pressure and heart rate in response to breathing 4% carbon dioxide or a 60° head-up tilt.³⁶ These changes in autonomic function, arousal, and cardiovascular reflexes might all increase an infant's vulnerability to SIDS. Brainstem abnormalities that involve the medullary serotonergic (5-hydroxytryptamine [5-HT]) system in up to 70% of infants who die from SIDS are the most robust and specific neuropathologic findings associated with SIDS and have been confirmed in several independent data sets and laboratories.^{37–40} This area of the brainstem plays a key role in coordinating many respiratory, arousal, and autonomic functions and, when dysfunctional, might prevent normal protective responses to stressors that commonly occur during sleep. Since the Task Force on Sudden Infant Death Syndrome report in 2005, more specific abnormalities have been described, including decreased 5-HT_{1A} receptor binding, a relative decrease in binding to the serotonin transporter, and in-

creased numbers of immature 5-HT neurons in regions of the brainstem that are important for autonomic function.⁴¹ These findings are not confined to nuclei containing 5-HT neurons but also include relevant projection sites. The most recent study report described in these same regions decreased tissue levels of 5-HT and tryptophan hydroxylase, the synthesizing enzyme for serotonin, and no evidence of excessive serotonin degradation as assessed by levels of 5-hydroxyindoleacetic acid (the main metabolite of serotonin) or ratios of 5-hydroxyindoleacetic acid to serotonin.³⁰ A recent article described a significant association between a decrease in medullary 5-HT_{1A} receptor immunoreactivity and specific SIDS risk factors, including tobacco smoking.⁴⁰ These data confirm results from earlier studies in humans^{39,41} and are also consistent with studies in piglets that revealed that postnatal exposure to nicotine decreases medullary 5-HT_{1A} receptor immunoreactivity.⁴² Animal studies have revealed that serotonergic neurons located in the medullary raphe and adjacent paragigantocellularis lateralis play important roles in many autonomic functions including the control of respiration, blood pressure, heart rate, thermoregulation, sleep and arousal, and upper airway patency. Engineered mice with decreased numbers of 5-HT neurons and rats or piglets with decreased activity secondary to 5-HT_{1A} autoreceptor stimulation have diminished ventilator responses to carbon dioxide, dysfunctional heat production and heat-loss mechanisms, and altered sleep architecture.⁴³ These studies linked SIDS risk factors with possible pathophysiology.

There is no evidence of a strong heritable contribution for SIDS. However, genetic alterations have been observed that may increase the vulnera-

bility to SIDS. Genetic variation can take the form of common base changes (polymorphisms) that alter gene function or rare base changes (mutations) that often have highly deleterious effects. Several categories of physiologic functions relevant to SIDS have been examined for altered genetic makeup. Genes related to the serotonin transporter, cardiac channelopathies, and the development of the autonomic nervous system are the subject of current investigation.⁴⁴ The serotonin transporter recovers serotonin from the extracellular space and largely serves to regulate overall serotonin neuronal activity. Results of a recent study support those in previous reports that polymorphisms in the promoter region that enhance the efficacy of the transporter (L) allele seem to be more prevalent in infants who die from SIDS compared with those reducing efficacy (S)⁴⁵; however, at least 1 study did not confirm this association.⁴⁶ It has also been reported that a polymorphism (12-repeat intron 2) of the promoter region of the serotonin transporter, which also enhances serotonin transporter efficiency, was increased in black infants who died from SIDS⁴⁴ but not in a Norwegian population.⁴⁵

It has been estimated that 5% to 10% of infants who die from SIDS have novel mutations in the cardiac sodium or potassium channel genes that result in long QT syndrome as well as in other genes that regulate channel function.⁴⁴ A recent report described important new molecular and functional evidence that implicates specific *SCN5A* (sodium channel gene) β subunits in SIDS pathogenesis.⁴⁷ The identification of polymorphisms in genes pertinent to the embryologic origin of the autonomic nervous system in SIDS cases also lends support to the hypothesis that a genetic predisposition contributes to the etiology of SIDS. There have

also been a number of reports of polymorphisms or mutations in genes that regulate inflammation,^{48,49} energy production,^{50–52} and hypoglycemia⁵³ in infants who died from SIDS, but these associations require more study to determine their importance.

ISSUES RELATED TO SLEEP POSITION

The Supine Sleep Position Is Recommended for Infants to Reduce the Risk of SIDS; Side Sleeping Is Not Safe and Is Not Advised

The prone or side sleep position can increase the risk of rebreathing expired gases, resulting in hypercapnia and hypoxia.^{54–57} The prone position also increases the risk of overheating by decreasing the rate of heat loss and increasing body temperature compared with infants sleeping supine.^{58,59} Recent evidence suggests that prone sleeping alters the autonomic control of the infant cardiovascular system during sleep, particularly at 2 to 3 months of age,⁶⁰ and can result in decreased cerebral oxygenation.⁶¹ The prone position places infants at high risk of SIDS (odds ratio [OR]: 2.3–13.1).^{62–66} However, recent studies have demonstrated that the SIDS risks associated with side and prone position are similar in magnitude (OR: 2.0 and 2.6, respectively)⁶³ and that the population-attributable risk reported for side sleep position is higher than that for prone position.^{65,67} Furthermore, the risk of SIDS is exceptionally high for infants who are placed on their side and found on their stomach (OR: 8.7).⁶³ The side sleep position is inherently unstable, and the probability of an infant rolling to the prone position from the side sleep position is significantly greater than rolling prone from the back.^{65,68} Infants who are unaccustomed to the prone position and are placed prone for sleep are also at

greater risk than those usually placed prone (adjusted OR: 8.7–45.4).^{63,69,70} Therefore, it is critically important that every caregiver use the supine sleep position for every sleep period.

Despite these recommendations, the prevalence of supine positioning has remained stagnant for the last decade.⁷¹ One of the most common reasons that parents and caregivers cite for not placing infants supine is fear of choking or aspiration in the supine position.^{72–80} Parents often misconstrue coughing or gagging, which is evidence of a normal protective gag reflex, for choking or aspiration. Multiple studies in different countries have not found an increased incidence of aspiration since the change to supine sleeping.^{81–83} There is often particular concern for aspiration when the infant has been diagnosed with gastroesophageal reflux. The AAP supports the recommendations of the North American Society for Pediatric Gastroenterology and Nutrition, which state that infants with gastroesophageal reflux should be placed for sleep in the supine position, with the rare exception of infants for whom the risk of death from gastroesophageal reflux is greater than the risk of SIDS⁸⁴—specifically, infants with upper airway disorders for whom airway protective mechanisms are impaired, which may include infants with anatomic abnormalities, such as type 3 or 4 laryngeal clefts, who have not undergone antireflux surgery. Elevating the head of the infant's crib while the infant is supine is not effective in reducing gastroesophageal reflux^{85,86}; in addition, this elevation can result in the infant sliding to the foot of the crib into a position that might compromise respiration and, therefore, is not recommended.

The other reason often cited by parents for not using the supine sleep position is the perception that the infant is uncomfortable or does not sleep

well.^{72–80} An infant who wakes frequently is normal and should not be perceived as a poor sleeper. Physiologic studies have found that infants are less likely to arouse when they are sleeping in the prone position.^{87–95} The ability to arouse from sleep is an important protective physiologic response to stressors during sleep,^{96–100} and the infant's ability to sleep for sustained periods might not be physiologically advantageous.

Preterm Infants Should Be Placed Supine as Soon as Possible

Infants born prematurely have an increased risk of SIDS,^{101,102} and the association between prone sleep position and SIDS among low birth weight infants is equal to, or perhaps even stronger than, the association among those born at term.⁶⁹ Therefore, preterm infants should be placed supine for sleep as soon as their clinical status has stabilized. The task force supports the recommendations of the AAP Committee on Fetus and Newborn, which state that hospitalized preterm infants should be placed in the supine position for sleep by 32 weeks' postmenstrual age to allow them to become accustomed to sleeping in that position before hospital discharge.¹⁰³ Unfortunately, preterm and very low birth weight infants continue to be more likely to be placed prone for sleep after hospital discharge.^{104,105} Preterm infants are placed prone initially to improve respiratory mechanics^{106,107}; although respiratory parameters are no different in the supine or prone positions in preterm infants who are close to discharge,¹⁰⁸ both infants and their caregivers likely become accustomed to using the prone position, which makes it more difficult to change. One study of NICU nurses found that only 50% of nurses place preterm infants supine during the transition to an open crib,

and more than 20% never place preterm infants supine or will only place them supine 1 to 2 days before discharge.¹⁰⁹ Moreover, very prematurely born infants studied before hospital discharge have longer sleep duration, fewer arousals from sleep, and increased central apneas while in the prone position.⁸⁸ The task force believes that neonatologists, neonatal nurses, and other health care professionals responsible for organizing the hospital discharge of infants from NICUs should be vigilant about endorsing SIDS risk-reduction recommendations from birth. They should model the recommendations as soon as the infant is medically stable and significantly before the infant's anticipated discharge. In addition, NICUs are encouraged to develop and implement policies to ensure that supine sleeping and other safe sleep practices are modeled for parents before discharge from the hospital.

Newborn Infants Should Be Placed Supine Within the First Few Hours After Birth

Practitioners who place infants on their sides after birth in newborn nurseries continue to be a concern. The practice likely occurs because nursery staff believe that newborn infants need to clear their airways of amniotic fluid and may be less likely to aspirate while on their sides. No evidence that such fluid will be cleared more readily while in the side position exists. Finally, and perhaps most importantly, if parents observe health care professionals placing infants in the side or prone position, they are likely to infer that supine positioning is not important¹¹⁰ and, therefore, might be more likely to copy this practice and use the side or prone position at home.^{77,80,111} The AAP recommends that infants be placed on their backs as

soon as they are ready to be placed in a bassinet.

Once an Infant Can Roll From the Supine to Prone and From the Prone to Supine Position, the Infant Can Be Allowed to Remain in the Sleep Position That He or She Assumes

Parents and caregivers are frequently concerned about the appropriate strategy for infants who have learned to roll over, which generally occurs at 4 to 6 months of age. As infants mature, it is more likely that they will roll. In 1 study, 6% and 12% of 16- to 23-week-old infants placed on their backs or sides, respectively, were found in the prone position; among infants aged 24 weeks or older, 14% of those placed on their backs and 18% of those placed on their sides were found in the prone position.¹¹² Repositioning the sleeping infant to the supine position can be disruptive and might discourage the use of supine position altogether. Although data to make specific recommendations as to when it is safe for infants to sleep in the prone position are lacking, the AAP recommends that these infants continue to be placed supine until 1 year of age. If the infant can roll from supine to prone and from prone to supine, the infant can then be allowed to remain in the sleep position that he or she assumes. To prevent suffocation or entrapment if the infant rolls, soft or loose bedding should continue to be removed from the infant's sleep environment. Some caregivers use such bedding to prevent an infant from rolling, but this bedding could cause suffocation and entrapment. Parents can be reassured by the information that the incidence of SIDS begins to decline after 4 months of age (Fig 6).

Supervised, Awake Tummy Time on a Daily Basis Can Promote Motor Development and Minimize the Risk of Positional Plagiocephaly

Positional plagiocephaly, or plagiocephaly without synostosis (PWS), can be associated with supine sleeping position (OR: 2.5).¹¹³ It is most likely to result if the infant's head position is not varied when placed for sleep, if the infant spends little or no time in awake, supervised tummy time, and if the infant is not held in the upright position when not sleeping.^{113–115} Children with developmental delay and/or neurologic injury have increased rates of PWS, although a causal relationship has not been demonstrated.^{113,116–119} In healthy normal children, the incidence of PWS decreases spontaneously from 20% at 8 months to 3% at 24 months of age.¹¹⁴ Although data to make specific recommendations as to how often and how long tummy time should be undertaken are lacking, supervised tummy time while the infant is awake is recommended on a daily basis. Tummy time should begin as early as possible to promote motor development, facilitate development of the upper body muscles, and minimize the risk of positional plagiocephaly. The AAP clinical report on positional skull deformities¹²⁰ provides additional detail on the prevention, diagnosis, and management of positional plagiocephaly.

SLEEP SURFACES

Infants Should Sleep in a Safety-Approved Crib, Portable Crib, Play Yard, or Bassinet

Cribs should meet safety standards of the CPSC, Juvenile Product Manufacturers Association, and the ASTM International (formerly the American Society for Testing and Materials), including those for slat spacing, snugly fitting and firm mattresses, and no drop sides.¹²¹ The AAP recommends the use of new cribs, because older

cribs might no longer meet current safety standards, might have missing parts, or might be incorrectly assembled. If an older crib is to be used, care must be taken to ensure that there have been no recalls on the crib model, that all of the hardware is intact, and that the assembly instructions are available.

For some families, use of a crib might not be possible for financial reasons or space considerations. In addition, parents might be reluctant to place the infant in the crib because of concerns that the crib is too large for the infant or that “crib death” (ie, SIDS) only occurs in cribs. Alternate sleep surfaces, such as portable cribs/play yards and bassinets might be more acceptable for some families, because they are smaller and more portable. Local organizations throughout the United States can help to provide low-cost or free cribs or play yards. If a portable crib/play yard or bassinet is to be used, it should meet the following CPSC guidelines: (1) sturdy bottom and wide base; (2) smooth surfaces without protruding hardware; (3) legs with locks to prevent folding while in use; and (4) firm, snugly fitting mattress.¹²¹ In addition, other AAP guidelines for safe sleep, including supine positioning and avoidance of soft objects and loose bedding, should be followed. Mattresses should be firm and should maintain their shape even when the fitted sheet designated for that model is used, such that there are no gaps between the mattress and the side of the bassinet, playpen, portable crib, or play yard. Only mattresses designed for the specific product should be used. Pillows or cushions should not be used as substitutes for mattresses or in addition to a mattress. Any fabric on the sides or a canopy should be taut and firmly attached to the frame so as not to create a suffocation risk for the infant. Portable cribs, play yards, and

bassinets with vertical sides made of air-permeable material may be preferable to those with air-impermeable sides.¹²² Finally, parents and caregivers should adhere to the manufacturer's guidelines regarding maximum weight of infants using these products.^{122,123} If the product is a combination product (eg, crib/toddler bed), the manual should be consulted when the mode of use is changed.

There are no data regarding the safety of sleepers that attach to the side of an adult bed. However, there are potential safety concerns if the sleeper is not attached properly to the side of the adult bed or if the infant moves into the adult bed. Therefore, the task force cannot make a recommendation for or against the use of bedside sleepers. In addition, infants should not be placed for sleep on adult-sized beds because of the risk of entrapment and suffocation.¹²⁴ Portable bed rails (railings installed on the side of the bed that are intended to prevent a child from falling off of the bed) should not be used with infants because of the risk of entrapment and strangulation.¹²⁵

Car Seats and Other Sitting Devices Are not Recommended for Routine Sleep at Home or in the Hospital, Particularly for Young Infants

Some parents let their infants sleep in a car seat or other sitting device. Sitting devices include but are not restricted to car seats, strollers, swings, infant carriers, and infant slings. Parents and caregivers often use these devices, even when not traveling, because they are convenient. One study found that the average young infant spends 5.7 hours/day in a car seat or similar sitting device.¹²⁶ However, there are multiple concerns about using sitting devices as a usual infant sleep location. Placing an infant in such devices can potentiate gastro-

esophageal reflux¹²⁷ and positional plagiocephaly. Because they still have poor head control and often experience flexion of the head while in a sitting position, infants younger than 1 month in sitting devices might be at increased risk of upper airway obstruction and oxygen desaturation.^{128–132} In addition, there is increasing concern about injuries from falls resulting from car seats being placed on elevated surfaces.^{133–137} An analysis of CPSC data revealed 15 suffocation deaths between 1990 and 1997 resulting from car seats overturning after being placed on a bed, mattress, or couch.¹³⁶ The CPSC also warns about the suffocation hazard to infants, particularly those who are younger than 4 months, who are carried in infant sling carriers.¹³⁸ When infant slings are used for carrying, it is important to ensure that the infant's head is up and above the fabric, the face is visible, and that the nose and mouth are clear of obstructions. After nursing, the infant should be repositioned in the sling so that the head is up and is clear of fabric and the adult's body.

BED-SHARING

Room-Sharing Without Bed-Sharing Is Recommended

The terms “bed-sharing” and “cosleeping” are often used interchangeably, but they are not synonymous. Cosleeping is when parent and infant sleep in close proximity (on the same surface or different surfaces) so as to be able to see, hear, and/or touch each other.^{139,140} Cosleeping arrangements can include bed-sharing or sleeping in the same room in close proximity.^{140,141} Bed-sharing refers to a specific type of cosleeping when the infant is sleeping on the same surface with another person.¹⁴⁰ Because the term cosleeping can be misconstrued and does not precisely describe sleep arrangements,

the AAP recommends use of the terms “room-sharing” and “bed-sharing.”

The AAP recommends the arrangement of room-sharing without bed-sharing, or having the infant sleep in the parents' room but on a separate sleep surface (crib or similar surface) close to the parents' bed. There is evidence that this arrangement decreases the risk of SIDS by as much as 50%.^{64,66,142,143} and is safer than bed-sharing^{64,66,142,143} or solitary sleeping (when the infant is in a separate room).^{53,64} In addition, this arrangement is most likely to prevent suffocation, strangulation, and entrapment, which may occur when the infant is sleeping in the adult bed. Furthermore, room-sharing without bed-sharing allows close proximity to the infant, which facilitates feeding, comforting, and monitoring of the infant.

Parent-infant bed-sharing is common. In 1 national survey, 45% of parents responded that they had shared a bed with their infant (8 months of age or younger) at some point in the preceding 2 weeks.¹⁹ In some racial/ethnic groups, the rate of routine bed-sharing might be higher.^{18–20} There are often cultural and personal reasons why parents choose to bed-share, including convenience for feeding (breastfeeding or with formula) and bonding. In addition, many parents might believe that their own vigilance is the only way that they can keep their infant safe and that the close proximity of bed-sharing allows them to maintain vigilance, even while sleeping.¹⁴⁴ Some parents will use bed-sharing specifically as a safety strategy if the infant sleeps in the prone position^{21,144} or if there is concern about environmental dangers such as vermin and stray gunfire.¹⁴⁴

Parent-infant bed-sharing continues to be highly controversial. Although electrophysiologic and behavioral studies have offered a strong case for its effect

in facilitating breastfeeding^{145,146} and although many parents believe that they can maintain vigilance of the infant while they are asleep and bed-sharing,¹⁴⁴ epidemiologic studies have shown that bed-sharing can be hazardous under certain conditions.^{147–150} Bed-sharing might increase the risk of overheating,¹⁵¹ rebreathing¹⁵² or airway obstruction,¹⁵³ head covering,^{152,154–156} and exposure to tobacco smoke,¹⁵⁷ which are all risk factors for SIDS. A recent meta-analysis of 11 studies that investigated the association of bed-sharing and SIDS revealed a summary OR of 2.88 (95% confidence interval [CI]: 1.99–4.18) with bed-sharing.¹⁵⁸ Furthermore, bed-sharing in an adult bed not designed for infant safety exposes the infant to additional risks for accidental injury and death, such as suffocation, asphyxia, entrapment, falls, and strangulation.^{159,160} Infants, particularly those in the first 3 months of life and those born prematurely and/or with low birth weight, are at highest risk,¹⁶¹ possibly because immature motor skills and muscle strength make it difficult to escape potential threats.¹⁵⁸ In recent years, the concern among public health officials about bed-sharing has increased, because there have been increased reports of SUIDs occurring in high-risk sleep environments, particularly bed-sharing and/or sleeping on a couch or armchair.^{162–165}

There Is Insufficient Evidence to Recommend Any Bed-Sharing Situation in the Hospital or at Home as Safe; Devices Promoted to Make Bed-Sharing “Safe” Are Not Recommended

Epidemiologic studies have not found bed-sharing to be protective against SIDS and accidental suffocation for any subgroups of the population. It is acknowledged that there are some cultures for which bed-sharing is the norm and SIDS rates are low, but there

are other cultures for which bed-sharing is the norm and SIDS rates are high. In general, the bed-sharing practiced in cultures with low SIDS rates is often different from that in the United States and other Western countries (eg, with firm mats on the floor, separate mat for the infant, and/or absence of soft bedding). It is statistically much more difficult to demonstrate safety (ie, no risk) in small subgroups. Breastfeeding mothers who do not smoke and have not consumed alcohol or arousal-altering medications or drugs are 1 such subgroup. Furthermore, not all risks associated with bed-sharing (eg, parental fatigue) can be controlled. The task force, therefore, believes that there is insufficient evidence to recommend any bed-sharing situation in the hospital or at home as safe. In addition, there is no evidence that devices marketed to make bed-sharing “safe” (eg, in-bed cosleepers) reduce the risk of SIDS or suffocation or are safe. Such devices, therefore, are not recommended.

There Are Specific Circumstances in Which Bed-Sharing Is Particularly Hazardous, and It Should Be Stressed to Parents That They Avoid the Following Situations at All Times

The task force emphasizes that certain circumstances greatly increase the risk with bed-sharing. Bed-sharing is especially dangerous when 1 or both parents are smokers (OR: 2.3–17.7)^{64,65,158,166,167}; when the infant is younger than 3 months (OR: 4.7–10.4), regardless of parental smoking status^{64,66,143,158,168,169}; when the infant is placed on excessively soft surfaces such as waterbeds, sofas, and armchairs (OR: 5.1–66.9)^{62,64,65,143,169}; when soft bedding accessories such as pillows or blankets are used (OR: 2.8–4.1)^{62,170}; when there are multiple bed-sharers (OR: 5.4)⁶²; and when the parent has consumed alcohol (OR:

1.66).^{66,171} There is also a higher risk of SIDS when the infant is bed-sharing with someone who is not a parent (OR: 5.4).⁶²

A retrospective series of SIDS cases indicated that mean maternal body weight was higher for bed-sharing mothers than for non-bed-sharing mothers.¹⁷² The only case-control study to investigate the relationship between maternal body weight and bed-sharing did not find an increased risk of bed-sharing with increased maternal weight.¹⁷³

Infants May Be Brought Into the Bed for Feeding or Comforting but Should Be Returned to Their Own Crib or Bassinet When the Parent Is Ready to Return to Sleep

The risk of bed-sharing is higher the longer the duration of bed-sharing during the night.^{64,65,167,169} Returning the infant to the crib after bringing him or her into the bed for a short period of time is not associated with increased risk.^{65,169} Therefore, if the infant is brought into the bed for feeding, comforting, and bonding, the infant should be returned to the crib when the parent is ready for sleep. Because of the extremely high risk of SIDS, accidental suffocation, and entrapment on couches and armchairs,^{62,64,65,143,169} infants should not be fed on a couch or armchair when there is high risk that the parent may fall asleep.

It Is Prudent to Provide Separate Sleep Areas and Avoid Cobedding for Twins and Higher-Order Multiples in the Hospital and at Home

Cobedding of twins and other infants of multiple gestation is a frequent practice, both in the hospital setting and at home.¹⁷⁴ However, the benefits of cobedding twins and higher-order multiples have not been established.^{175–177} Twins and higher-order

multiples are often born prematurely and with low birth weight, so they are at increased risk of SIDS.^{101,102} Furthermore, there is increased potential for overheating and rebreathing while cobedding, and size discordance might increase the risk of accidental suffocation.¹⁷⁶ Most cobedded twins are placed on their sides rather than supine.¹⁷⁴ Finally, cobedding of twins and higher-order multiples in the hospital setting might encourage parents to continue this practice at home.¹⁷⁶ Because the evidence for the benefits of cobedding twins and higher-order multiples is not compelling and because of the increased risk of SIDS and suffocation, the AAP believes that it is prudent to provide separate sleep areas for these infants to decrease the risk of SIDS and accidental suffocation.

BEDDING

Pillows, Quilts, Comforters, Sheepskins, and Other Soft Surfaces Are Hazardous When Placed Under the Infant or Loose in the Sleep Environment

Bedding is used in infant sleep environments for comfort and safety.¹⁷⁸ Parents and caregivers who perceive that infants are uncomfortable on firm surfaces will often attempt to soften the surface with blankets and pillows. Parents and caregivers will also use pillows and blankets to create barriers to prevent the infant from falling off the sleep surface (usually an adult bed or couch) or to prevent injury if the infant hits the crib side. However, such soft bedding can increase the potential of suffocation and rebreathing.^{54,56,57,179–181} Pillows, quilts, comforters, sheepskins, and other soft surfaces are hazardous when placed under the infant^{62,147,182–187} or left loose in the infant's sleep area^{62,65,184,185,188–191} and can increase SIDS risk up to fivefold independent of sleep position.^{62,147} Several reports have also described that

in many SIDS cases, the heads of the infants, including some infants who slept supine, were covered by loose bedding.^{65,186,187,191} It should be noted that the risk of SIDS increases 21-fold when the infant is placed prone with soft bedding.⁶² In addition, soft and loose bedding have both been associated with accidental suffocation deaths.¹⁴⁹ The CPSC has reported that the majority of sleep-related infant deaths in its database are attributable to suffocation involving pillows, quilts, and extra bedding.^{192,193} The AAP recommends that infants sleep on a firm surface without any soft or loose bedding. Pillows, quilts, and comforters should never be in the infant's sleep environment. Specifically, these items should not be placed loose near the infant, between the mattress and the sheet, or under the infant. Infant sleep clothing that is designed to keep the infant warm without the possible hazard of head covering or entrapment can be used in place of blankets; however, care must be taken to select appropriately sized clothing and to avoid overheating. If a blanket is used, it should be thin and tucked under the mattress so as to avoid head or face covering. These practices should also be modeled in hospital settings.

Wedges and Positioning Devices Are not Recommended

Wedges and positioning devices are often used by parents to maintain the infant in the side or supine position because of claims that these products reduce the risk for SIDS, suffocation, or gastroesophageal reflux. However, these products are frequently made with soft, compressible materials, which might increase the risk of suffocation. The CPSC has reports of deaths attributable to suffocation and entrapment associated with wedges and positioning devices. Most of these deaths occurred when infants were placed in the prone or side position with these

devices; other incidents have occurred when infants have slipped out of the restraints or rolled into a prone position while using the device.^{2,194} Because of the lack of evidence that they are effective against SIDS, suffocation, or gastroesophageal reflux and because there is potential for suffocation and entrapment, the AAP concurs with the CPSC and the US Food and Drug Administration in warning against the use of these products. If positioning devices are used in the hospital as part of physical therapy, they should be removed from the infant sleep area well before discharge from the hospital.

Bumper Pads and Similar Products Are not Recommended

Bumper pads and similar products that attach to crib slats or sides are frequently used with the thought of protecting infants from injury. Initially, bumper pads were developed to prevent head entrapment between crib slats.¹⁹⁵ However, newer crib standards that require crib slat spacing to be less than 2 $\frac{3}{8}$ inches have obviated the need for crib bumpers. In addition, infant deaths have occurred because of bumper pads. A recent report by Thach et al,¹⁹⁶ who used CPSC data, found that deaths attributed to bumper pads were from 3 mechanisms: (1) suffocation against soft, pillow-like bumper pads; (2) entrapment between the mattress or crib and firm bumper pads; and (3) strangulation from bumper pad ties. However, the CPSC believes that there were other confounding factors, such as the presence of pillows and/or blankets, that might have contributed to many of the deaths in this report.² Thach et al¹⁹⁶ also analyzed crib injuries that might have been prevented by bumper pad use and concluded that the use of bumper pads only prevents minor injuries. A more recent study of crib injuries that used data from the CPSC National Electronic Injury Surveillance System con-

cluded that the potential benefits of preventing minor injury with bumper pad use were far outweighed by the risk of serious injury such as suffocation or strangulation.¹⁹⁷ In addition, most bumper pads obscure infant and parent visibility, which might increase parental anxiety.¹⁹⁵ There are other products that attach to crib sides or crib slats that claim to protect infants from injury. However, there are no published data that support these claims. Because of the potential for suffocation, entrapment, and strangulation and lack of evidence to support that bumper pads or similar products that attach to crib slats or sides prevent injury in young infants, the AAP does not recommend their use.

PRENATAL AND POSTNATAL EXPOSURES (INCLUDING SMOKING AND ALCOHOL)

Pregnant Women Should Seek and Obtain Regular Prenatal Care

There is substantial epidemiologic evidence that links a lower risk of SIDS for infants whose mothers obtain regular prenatal care.^{198–200} Women should seek prenatal care early in the pregnancy and continue to obtain regular prenatal care during the entire pregnancy.

Smoking During Pregnancy, in the Pregnant Woman's Environment, and in the Infant's Environment Should Be Avoided

Maternal smoking during pregnancy is a major risk factor in almost every epidemiologic study of SIDS.^{201–204} Smoke in the infant's environment after birth is a separate major risk factor in a few studies,^{202,205} although separating this variable from maternal smoking before birth is problematic. Thirdhand smoke refers to residual contamination from tobacco smoke after the cigarette has been extinguished²⁰⁶; there is no research to date on the signifi-

cance of thirdhand smoke with regards to SIDS risk. Smoke exposure adversely affects infant arousal^{207–213}; in addition, smoke exposure increases risk of preterm birth and low birth weight, both of which are risk factors for SIDS. The effect of tobacco smoke exposure on SIDS risk is dose-dependent. Aside from sleep position, smoke exposure is the largest contributing risk factor for SIDS.¹⁴⁹ It is estimated that one-third of SIDS deaths could be prevented if all maternal smoking during pregnancy were eliminated.^{214,215} The AAP supports the elimination of all tobacco smoke exposure, both prenatally and environmentally.^{216,217}

Avoid Alcohol and Illicit Drug Use During Pregnancy and After the Infant's Birth

Several studies have specifically investigated the association of SIDS with prenatal and postnatal exposure to alcohol or illicit drug use, although substance abuse often involves more than 1 substance and it is difficult to separate these variables from each other and from smoking. However, 1 study of Northern Plains American Indians found that periconceptional maternal alcohol use (adjusted OR: 6.2 [95% CI: 1.6–23.3]) and maternal first-trimester binge drinking (adjusted OR: 8.2 [95% CI: 1.9–35.3])²¹⁸ were associated with increased SIDS risk independent of prenatal cigarette smoking exposure. Another study from Denmark, which was based on prospective data about maternal alcohol use, also found a significant relationship between maternal binge drinking and postneonatal infant mortality, including SIDS.²¹⁹

Postmortem studies of Northern Plains American Indian infants revealed that prenatal cigarette smoking was significantly associated with decreased serotonin receptor binding in the brainstem. In this study, the asso-

ciation of maternal alcohol drinking in the 3 months before or during pregnancy was of borderline significance on univariate analysis but was not significant when prenatal smoking and case-versus-control status were in the model.³⁹ However, this study had limited power for multivariate analysis because of its small sample size. One study found an association of SIDS with heavy alcohol consumption in the 2 days before the death.²²⁰ Although some studies have found a particularly strong association when alcohol consumption occurs in combination with bed-sharing,^{64–66,221} other studies have not found interaction between bed-sharing and alcohol to be significant.^{167,222}

Studies investigating the relationship of illicit drug use and SIDS have focused on specific drugs or illicit drug use in general. In utero exposure to opiates (primarily methadone and heroin) has been shown in retrospective studies to be associated with an increased risk of SIDS.^{223,224} With the exception of 1 study that did not show increased risk,²²⁵ population-based studies have generally shown an increased risk with in utero cocaine exposure.^{226–228} However, these studies did not control for confounding factors. A prospective cohort study found the SIDS rate to be significantly increased for infants exposed in utero to methadone (OR: 3.6 [95% CI: 2.5–5.1]), heroin (OR: 2.3 [95% CI: 1.3–4.0]), methadone and heroin (OR: 3.2 [95% CI: 1.2–8.6]), and cocaine (OR: 1.6 [95% CI: 1.2–2.2]), even after controlling for race/ethnicity, maternal age, parity, birth weight, year of birth, and maternal smoking.²²⁹ In addition, a meta-analysis of studies that investigated an association between in utero cocaine exposure and SIDS found an increased risk of SIDS to be associated with prenatal exposure to cocaine and illicit drugs in general.²³⁰

BREASTFEEDING

Breastfeeding Is Recommended

Earlier epidemiologic studies were not consistent in demonstrating a protective effect of breastfeeding on SIDS*; some studies found a protective effect,^{67,239,240} and others did not.[†] Because many of the case-control studies demonstrated a protective effect of breastfeeding against SIDS in univariate analysis but not when confounding factors were taken into account,^{62,184,198,231,238} these results suggested that factors associated with breastfeeding, rather than breastfeeding itself, are protective. However, newer published reports support the protective role of breastfeeding on SIDS when taking into account potential confounding factors.^{243–245} Studies do not distinguish between nursing and expressed human milk. In the Agency for Healthcare Research and Quality's "Evidence Report on Breastfeeding in Developed Countries,"²⁴³ multiple outcomes, including SIDS, were examined. Six studies were included in the SIDS-breastfeeding meta-analysis, and in both unadjusted and adjusted analysis, ever breastfeeding was associated with a lower risk of SIDS (summary OR: 0.41 [95% CI: 0.28–0.58]; adjusted summary OR: 0.64 [95% CI: 0.51–0.81]). The German Study of Sudden Infant Death, the largest and most recent case-control study of SIDS, found that exclusive breastfeeding at 1 month of age halved the risk of SIDS (adjusted OR: 0.48 [95% CI: 0.28–0.82]). At all ages, control infants were breastfed at higher rates than SIDS victims, and the protective effect of partial or exclusive breastfeeding remained statistically significant after adjustment for confounders.²⁴⁴ A recent meta-analysis that included 18 case-control studies revealed an unadjusted summary OR for any breast-

*Refs 62, 65, 67, 184, 198, and 231–239.

†Refs 62, 184, 198, 231, 238, 241, and 242.

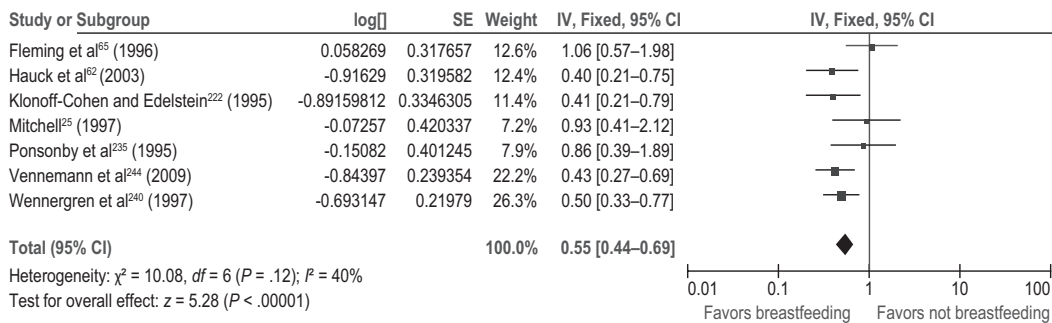


FIGURE 9

Multivariable analysis of any breastfeeding versus no breastfeeding. log[] indicates logarithm of the OR; weight, weighting that the study contributed to the meta-analysis (according to sample size); IV, fixed, 95% CI: fixed-effect OR with 95% CI.²⁴⁵

feeding of 0.40 (95% CI: 0.35–0.44). Seven of these studies provided adjusted ORs, and on the basis of these studies, the pooled adjusted OR remained statistically significant at 0.55 (95% CI: 0.44–0.69) (Fig 9).²⁴⁵ The protective effect of breastfeeding increased with exclusivity, with a univariable summary OR of 0.27 (95% CI: 0.24–0.31) for exclusive breastfeeding of any duration.²⁴⁵

Currently in the United States, 73% of mothers initiate breastfeeding, and 42% and 21% are still breastfeeding at 6 and 12 months, respectively.²⁴⁶ Non-Hispanic black mothers are least likely to initiate or to still be breastfeeding at 6 and 12 months (54%, 27%, and 12%, respectively), whereas Asian/Pacific Islander mothers initiate and continue breastfeeding more than other groups (81%, 52%, and 30%, respectively). Rates for initiating and continuing breastfeeding at 6 and 12 months for non-Hispanic white mothers are 74%, 43%, and 21%; rates for Hispanic mothers are 80%, 45%, and 24%; and rates for American Indian/Alaskan Native mothers are 70%, 37%, and 19%, respectively.

Physiologic sleep studies have found that breastfed infants are more easily aroused from sleep than their formula-fed counterparts.^{247,248} In addition, breastfeeding results in a decreased incidence of diarrhea, upper and lower respiratory infections, and

other infectious diseases²⁴⁹ that are associated with an increased vulnerability to SIDS and provides overall immune system benefits from maternal antibodies and micronutrients in human milk.^{250,251} Exclusive breastfeeding for 6 months has been found to be more protective against infectious diseases compared with exclusive breastfeeding to 4 months of age and partial breastfeeding thereafter.²⁴⁹

If a Breastfeeding Mother Brings the Infant Into the Adult Bed for Nursing, the Infant Should Be Returned to a Separate Sleep Surface When the Mother Is Ready for Sleep

Several organizations promote the practice of mother-infant bed-sharing (ie, sleeping in the same bed) as a way of facilitating breastfeeding.^{142,252,253} Breastfeeding is a common reason given by mothers for bed-sharing with their infants.²⁵⁴ Studies have found an association between bed-sharing and longer duration of breastfeeding, but their data cannot determine a temporal relationship (ie, it is not known whether bed-sharing promotes breastfeeding or if breastfeeding promotes bed-sharing, or if women who prefer 1 practice are also likely to prefer the other).²⁵⁵ Although bed-sharing may facilitate breastfeeding, it is not essential for successful breastfeeding.^{256,257} Furthermore, 1 case-control

study found that the risk of SIDS while bed-sharing was similar regardless of breastfeeding status, which indicates that the benefits of breastfeeding do not outweigh the increased risk associated with bed-sharing.²⁵⁸

PACIFIER USE

Consider Offering a Pacifier at Nap Time And Bedtime

Several studies^{62,66,167,231,259–262} have found a protective effect of pacifiers on the incidence of SIDS, particularly when used at the time of last sleep. Two meta-analyses revealed that pacifier use decreased the risk of SIDS by 50% to 60% (summary adjusted OR: 0.39 [95% CI: 0.31–0.50]²⁶³; summary unadjusted OR: 0.48 [95% CI: 0.43–0.54]²⁶⁴). Two later studies not included in these meta-analyses reported equivalent or even larger protective associations.^{265,266} The mechanism for this apparent strong protective effect is still unclear, but lowered arousal thresholds, favorable modification of autonomic control during sleep, and maintaining airway patency during sleep have been proposed.^{247,267–270} It is common for the pacifier to fall from the mouth soon after the infant falls asleep; even so, the protective effect persists throughout that sleep period.^{247,271} Two studies have shown that pacifier use is most protective when used for all sleep periods.^{169,266} However, these studies also

showed increased risk of SIDS when the pacifier was usually used but not used the last time the infant was placed for sleep; the significance of these findings is yet unclear.

Although some SIDS experts and policy-makers endorse pacifier use recommendations that are similar to those of the AAP,^{272,273} concerns about possible deleterious effects of pacifier use have prevented others from making a recommendation for pacifier use as a risk reduction strategy.²⁷⁴ Although several observational studies^{275–277} have found a correlation between pacifiers and reduced breastfeeding duration, the results of well-designed randomized clinical trials indicated that pacifiers do not seem to cause shortened breastfeeding duration for term and preterm infants.^{278,279} The authors of 1 study reported a small deleterious effect of early pacifier introduction (2–5 days after birth) on exclusive breastfeeding at 1 month of age and on overall breastfeeding duration (defined as any breastfeeding), but early pacifier use did not adversely affect exclusive breastfeeding duration. In addition, there was no effect on breastfeeding duration when the pacifier was introduced at 1 month of age.²⁸⁰ A more recent systematic review found that the highest level of evidence (ie, from clinical trials) does not support an adverse relationship between pacifier use and breastfeeding duration or exclusivity.²⁸¹ The association between shortened duration of breastfeeding and pacifier use in observational studies likely reflects a number of complex factors such as breastfeeding difficulties or intent to wean.²⁸¹ A large multicenter, randomized controlled trial of 1021 mothers who were highly motivated to breastfeed were assigned to 2 groups: mothers advised to offer a pacifier after 15 days and mothers advised not to offer a pacifier. At 3

months, there were no differences in breastfeeding rates between the 2 groups; 85.8% of infants in the offer-pacifier group were exclusively breastfed compared with 86.2% in the not-offered group.²⁸² The AAP policy statement on breastfeeding and the use of human milk includes a recommendation that pacifiers can be used during breastfeeding, but implementation should be delayed until breastfeeding is well established.²⁸³

Some dental malocclusions have been found more commonly among pacifier users than nonusers, but the differences generally disappeared after pacifier cessation.²⁸⁴ In its policy statement on oral habits, the American Academy of Pediatric Dentistry states that nonnutritive sucking behaviors (ie, fingers or pacifiers) are considered normal for infants and young children and that, in general, sucking habits in children to the age of 3 years are unlikely to cause any long-term problems.²⁸⁵ There is an approximate 1.2- to 2-fold increased risk of otitis media associated with pacifier use, particularly between 2 and 3 years of age.^{286,287} The incidence of otitis media is generally lower in the first year of life, especially the first 6 months, when the risk of SIDS is the highest.^{288–293} However, pacifier use, once established, may persist beyond 6 months, thus increasing the risk of otitis media. Gastrointestinal infections and oral colonization with *Candida* species were also found to be more common among pacifier users than nonusers.^{289–291}

The literature on infant digit-sucking and SIDS is extremely limited. Only 1 case-control study from the Netherlands has reported results.²⁶² This study did not find an association between usual digit-sucking (reported as “thumb-sucking”) and SIDS risk (OR: 1.38 [95% CI: 0.35–1.51]), but the wide CI suggests that there was insufficient

power to detect a significant association.

OVERHEATING, FANS, AND ROOM VENTILATION

Avoid Overheating and Head Covering in Infants

There is clear evidence that the risk of SIDS is associated with the amount of clothing or blankets on an infant and the room temperature.^{182,218,294,295} Infants who sleep in the prone position have a higher risk of overheating than do supine sleeping infants.¹⁸² It is unclear whether the relationship to overheating is an independent factor or merely a reflection of the increased risk of SIDS and suffocation with blankets and other potentially asphyxiating objects in the sleeping environment. Head covering during sleep is of particular concern. In a recent systematic review, the pooled mean prevalence of head covering among SIDS victims was 24.6% compared with 3.2% among control infants.¹⁵⁴ It is not known whether the risk associated with head covering is attributable to overheating, hypoxia, or rebreathing.

There has been some suggestion that room ventilation may be important. One study found that bedroom heating, compared with no bedroom heating, increases SIDS risk (OR: 4.5),²³⁵ and another study has also demonstrated a decreased risk of SIDS in a well-ventilated bedroom (windows and doors open) (OR: 0.4).²⁹⁶ In 1 study, the use of a fan seemed to reduce the risk of SIDS (adjusted OR: 0.28 [95% CI: 0.10–0.77]).²⁹⁷ However, because of the possibility of recall bias, the small sample size of controls using fans ($n = 36$), a lack of detail about the location and types of fans used, and the weak link to a mechanism, this study's results should be interpreted with caution. On the basis of available data, the task force cannot make a recommendation on the use

of a fan as a SIDS risk-reduction strategy.

SWADDLING

Although Swaddling May Be Used as a Strategy to Calm the Infant and Encourage Use of Supine Position, There Is Not Enough Evidence to Recommend It as a Strategy for Reducing the Risk of SIDS

Many cultures and newborn nurseries have traditionally used swaddling, or wrapping the infant in a light blanket, as a strategy to soothe infants and, in some cases, encourage sleep in the supine position. Swaddling, when done correctly, can be an effective technique to help calm infants and promote sleep.²⁹⁸ Some have argued that swaddling can alter certain risk factors for SIDS, thus reducing the risk of SIDS. For instance, it has been suggested that the physical restraint associated with swaddling may prevent infants placed supine from rolling to the prone position.²⁹⁹ One study's results suggested a decrease in SIDS rate with swaddling if the infant was supine,¹⁸² but it was notable that there was an increased risk of SIDS if the infant was swaddled and placed in the prone position.¹⁸² Although a recent study found a 31-fold increase in SIDS risk with swaddling, the analysis was not stratified according to sleep position.¹⁷¹ Although it may be more likely that parents will initially place a swaddled infant supine, this protective effect may be offset by the 12-fold increased risk of SIDS if the infant is either placed or rolls to the prone position when swaddled.^{182,300} Moreover, there is no evidence that swaddling reduces bed-sharing or use of unsafe sleep surfaces, promotes breastfeeding, or reduces maternal cigarette smoking.

There is some evidence that swaddling might cause detrimental physiologic

consequences. For example, it can cause an increase in respiratory rate,³⁰¹ and tight swaddling can reduce the infant's functional residual lung capacity.^{299,302,303} Tight swaddling can also exacerbate hip dysplasia if the hips are kept in extension and adduction.^{304–307} This is particularly important, because some have advocated that the calming effects of swaddling are related to the “tightness” of the swaddling. In contrast, “loose” or incorrectly applied swaddling could result in head covering and, in some cases, strangulation if the blankets become loose in the bed. Swaddling may also possibly increase the risk of overheating in some situations, especially when the head is covered or the infant has an infection.^{308,309} However, a recent study found no increase in abdominal skin temperature when infants were swaddled in a light cotton blanket from the shoulders down.³⁰²

Impaired arousal has often been postulated as a mechanism that contributes to SIDS, and several studies have investigated the relationship between swaddling, arousal, and sleep patterns in infants. Physiologic studies have demonstrated that, in general, swaddling decreases startling,³⁰¹ increases sleep duration, and decreases spontaneous awakenings.³¹⁰ Swaddling also decreases arousability (ie, increases cortical arousal thresholds) to a nasal pulsatile air-jet stimulus, especially in infants who are easily arousable when not swaddled but less so in infants who have high arousal thresholds when not swaddled.³⁰¹ One study found decreased arousability in infants at 3 months of age who were not usually swaddled and then were swaddled but found no effect on arousability in routinely swaddled infants.³⁰¹ In contrast, another group of investigators showed decreased arousal thresholds³¹⁰ and increases in autonomic (subcortical) responses³¹¹ to an auditory stimulus

when swaddled. Thus, although swaddling clearly promotes sleep and decreases the number of awakenings, the effects on arousability to an external stimulus remain unclear. There is accumulating evidence, however, that there are only minimal effects of routine swaddling on arousal. In addition, there have been no studies investigating the effects of swaddling on arousal to more relevant stimuli such as hypoxia or hypercapnia.

In summary, it is recognized that swaddling is one of many child care practices that can be used to calm infants and promote sleep. However, there is insufficient evidence to recommend routine swaddling as a strategy for reducing the incidence of SIDS. Moreover, as many have advocated, swaddling must be correctly applied to avoid possible hazards such as hip dysplasia, head covering, and strangulation. It is important to note that swaddling does not reduce the necessity to follow recommended safe sleep practices.

IMMUNIZATIONS AND SIDS

Infants Should Be Immunized in Accordance With Recommendations of the AAP and Centers for Disease Control and Prevention

The incidence of SIDS peaks at a time when infants are receiving numerous immunizations. Case reports of a cluster of deaths shortly after immunization with diphtheria-tetanus-pertussis in the late 1970s created concern of a possible causal relationship between vaccinations and SIDS.^{312–315} Case-control studies were performed to evaluate this temporal association. Four of the 6 studies found no relationship between diphtheria-tetanus-pertussis vaccination and subsequent SIDS,^{316–319} and results of the other 2 studies suggested a temporal relationship but only in specific subgroup anal-

ysis.^{320,321} In 2003, the Institute of Medicine of the National Academy of Sciences reviewed available data and concluded that “[t]he evidence favors rejection of a causal relationship between exposure to multiple vaccinations and SIDS.”³²² Additional subsequent large population case-control trials consistently have found vaccines to be protective against SIDS^{323–325}, however, confounding factors (social, maternal, birth, and infant medical history) might account for this protective effect.³²⁶ It also has been theorized that the decreased SIDS rate immediately after vaccination was attributable to infants being healthier at time of immunization, or “the healthy vaccinee effect.”³²⁷ Recent illness would both place infants at higher risk of SIDS and make them more likely to have immunizations deferred.³²⁸

Recent studies have attempted to control for confounding by social, maternal, birth, and infant medical history.^{323,325,328} In a meta-analysis, Vennemann et al³²⁸ found a multivariate summary OR for immunizations and SIDS to be 0.54 (95% CI: 0.39–0.76), which indicates that the risk of SIDS is halved by immunization. The evidence continues to show no causal relationship between immunizations and SIDS and suggests that vaccination may have a protective effect against SIDS.

HOME MONITORS, SIDS, AND APPARENT LIFE-THREATENING EVENTS

There Is no Evidence That Apparent Life-Threatening Events Are Precursors to SIDS, and Infant Home Monitors Should Not Be Used as a Strategy for Preventing SIDS

For many years it was believed that apparent life-threatening events were the predecessors of SIDS, and home apnea monitors were used as a strat-

egy for preventing SIDS.³²⁹ However, there is no evidence that home monitors are effective for this purpose.^{330–333} The task force concurs with the AAP Committee on Fetus and Newborn, which has recommended that infant home monitoring not be used as a strategy to prevent SIDS, although it can be useful for some infants who have had an apparent life-threatening event.³³⁴

POTENTIAL TOXICANTS AND SIDS

There Is no Evidence Linking Various Toxicants to SIDS

Many theories link various toxicants and SIDS. Currently, no studies have substantiated a causal relationship between metals, such as silver, cadmium, cobalt, lead, or mercury, and SIDS.^{335–337} Although an ecological study found correlation of the maximal recorded nitrate levels of drinking water with local SIDS rates in Sweden,³³⁸ no case-control study has demonstrated a relationship between nitrates in drinking water and SIDS. Furthermore, an expert group in the United Kingdom analyzed data pertaining to a hypothesis that SIDS is related to toxic gases, such as antimony, phosphorus, or arsenic, being released from mattresses^{339,340} and found the toxic-gas hypothesis to be unsubstantiated.³⁴¹ Finally, 2 case-control studies found that wrapping mattresses in plastic to reduce toxic gas emission did not protect against SIDS.^{191,342}

HEARING SCREENS

Newborn Hearing Screens Should Not Be Used as a Screening Test for SIDS

A single, small, retrospective case-control study examined the use of newborn transient evoked otoacoustic emission hearing screening tests as a tool for identifying infants at subsequent risk of SIDS.³⁴³ Infants who sub-

sequently died from SIDS did not fail their hearing tests but, compared with controls, showed a decreased signal-to-noise ratio score in the right ear only (at frequencies of 2000, 3000, and 4000 Hz). Methodologic concerns have been raised about the validity of the study methods used in this study,^{344,345} and these results have not been substantiated by others. A larger but non-peer-reviewed report of hearing screening data in Michigan revealed no relationship between hearing screening test results and SIDS cases.³⁴⁶ Until additional data are available, hearing screening should not be considered as a valid screening tool for determining which infants might be at subsequent risk of SIDS. Furthermore, an increased risk of SIDS should not be inferred from an abnormal hearing screen result.

EDUCATIONAL INTERVENTIONS

Educational and Intervention Campaigns Are Often Effective in Altering Practice

Intervention campaigns for SIDS have been extremely effective, especially with regard to avoidance of prone positioning.³⁴⁷ Furthermore, there is evidence that primary care-based educational interventions, particularly those that address caregiver concerns and misconceptions about safe sleep recommendations, can be effective in altering practice. For instance, addressing concerns about infant comfort, choking, and aspiration while the infant is sleeping prone is helpful.^{348,349} Similar interventions for improving behavior of medical and nursing staff and child care providers have shown that these professionals have similar concerns about the supine sleep position.^{350–353} Primary care providers should be encouraged to develop quality improvement initiatives to improve

adherence with safe sleep recommendations among their patients.

MEDIA MESSAGES

Media and Manufacturers Should Follow Safe Sleep Guidelines in Their Messaging and Advertising

A recent study found that, in magazines targeted toward childbearing women, more than one-third of pictures of sleeping infants and two-thirds of pictures of infant sleep environments portrayed unsafe sleep positions and sleep environments.³⁵⁴ Media exposures (including movie, television, magazines, newspapers, and Web sites), manufacturer advertisements, and store displays affect individual behavior by influencing beliefs and attitudes. Frequent exposure to health-related media messages can affect individual health decisions,^{355,356}

and media messages have been quite influential in decisions regarding sleep position.^{77,80} Media and advertising messages contrary to safe sleep recommendations may create misinformation about safe sleep practices. Safe sleep messages should be reviewed, revised, and reissued at least every 5 years to address the next generation of new parents and products on the market.

RECOMMENDATIONS

The AAP's recommendations for a safe infant sleeping environment to reduce the risk of both SIDS and other sleep-related infant deaths are specified in the accompanying policy statement.⁴

LEAD AUTHOR

Rachel Y. Moon, MD

TASK FORCE ON SUDDEN INFANT DEATH SYNDROME, 2010–2011

Rachel Y. Moon, MD, Chairperson

Robert A. Darnall, MD
Michael H. Goodstein, MD
Fern R. Hauck, MD, MS

CONSULTANTS

Marian Willinger, PhD – *Eunice Kennedy Shriver National Institute for Child Health and Human Development*
Carrie K. Shapiro-Mendoza, PhD, MPH – *Centers for Disease Control and Prevention*

STAFF

James Couto, MA

ACKNOWLEDGMENTS

The task force acknowledges the contributions provided by others to the collection and interpretation of data examined in preparation of this report. The task force is particularly grateful for the report submitted by Dr Suad Wanna-Nakamura (CPSC) and for the assistance of Sarah McKinnon, PhD, MPH, and Cristina Rodriguez-Hart, MPH, with the statistics and graphs.

REFERENCES

1. Kattwinkel J, Hauck FR, Keenan ME, Malloy MH, Moon RY; American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*. 2005;116(5):1245–1255
2. Wanna-Nakamura S. *White Paper: Unsafe Sleep Settings—Hazards Associated With the Infant Sleep Environment and Unsafe Practices Used by Caregivers: A CPSC Staff Perspective*. Bethesda, MD: US Consumer Product Safety Commission; 2010
3. US Preventive Services Task Force. Grade definitions. Available at: www.uspreventiveservicestaskforce.org/uspstf/grades.htm. Accessed March 22, 2011
4. Moon RY; American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. Policy statement: SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*. 2011;128(5):1030–1039
5. Willinger M, James LS, Catz C. Defining the sudden infant death syndrome (SIDS): deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatr Pathol*. 1991; 11(5):677–684
6. Centers for Disease Control and Prevention. Sudden unexplained infant death investigation reporting form (SUIDIRF). Available at: www.cdc.gov/SIDS/SUIDIRF.htm. Accessed September 20, 2011
7. Camperlengo LT, Shapiro-Mendoza CK, Kim SY. Sudden infant death syndrome: diagnostic practices and investigative policies, 2004. *Am J Forensic Med Pathol*. 2011; In press
8. Krous HF, Chadwick AE, Haas EA, Stanley C. Pulmonary intra-alveolar hemorrhage in SIDS and suffocation. *J Forensic Leg Med*. 2007;14(8):461–470
9. Kattwinkel J, Brooks J, Myerberg D; American Academy of Pediatrics, Task Force on Infant Positioning and SIDS. Positioning and SIDS [published correction appears in *Pediatrics*. 1992;90(2 pt 1):264]. *Pediatrics*. 1992;89(6 pt 1):1120–1126
10. Eunice Kennedy Shriver National Institute of Child Health and Human Development/ National Institutes of Health. Back to Sleep public education campaign. Available at: www.nichd.nih.gov/sids/sids.cfm. Accessed July 7, 2010
11. National Infant Sleep Position Study [home page]. Available at: http://dccwww.bumc.bu.edu/ChimeNisp/Main_Nisp.asp. Accessed April 5, 2011
12. US Department of Health and Human Services, Centers of Disease Control and Prevention, National Center for Health Statistics, Office of Analysis and Epidemiology, Division of Vital Statistics. Compressed mortality data: underlying cause-of-death—mortality for 1979–1998 with ICD 9 codes; and Mortality for 1999–2007 with ICD 10 codes. Available at: <http://wonder.cdc.gov/mortSQL.html>. Accessed July 8, 2010
13. Malloy MH, MacDorman M. Changes in the classification of sudden unexpected infant deaths: United States, 1992–2001. *Pediatrics*. 2005;115(5):1247–1253
14. Shapiro-Mendoza CK, Tomashek KM, Anderson RN, Wingo J. Recent national trends in sudden, unexpected infant deaths: more evidence supporting a change in classification or reporting. *Am J Epidemiol*. 2006;163(8):762–769
15. Shapiro-Mendoza CK, Kimball M, Tomashek KM, Anderson RN, Blanding S. US infant mortality trends attributable to accidental suffocation and strangulation in bed from 1984 through 2004: are rates increasing? *Pediatrics*. 2009;123(2):533
16. Shapiro-Mendoza CK, Kim SY, Chu SY, Kahn

- E, Anderson RN. Using death certificates to characterize sudden infant death syndrome (SIDS): opportunities and limitations. *J Pediatr*. 2010;156(1):38–43
17. Hauck FR, Moore CM, Herman SM, et al. The contribution of prone sleeping position to the racial disparity in sudden infant death syndrome: the Chicago Infant Mortality Study. *Pediatrics*. 2002;110(4):772–780
 18. Lahr MB, Rosenberg KD, Lapidus JA. Maternal-infant bedsharing: risk factors for bedsharing in a population-based survey of new mothers and implications for SIDS risk reduction. *Matern Child Health J*. 2007;11(3):277–286
 19. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ. Trends in infant bed sharing in the United States, 1993–2000: the National Infant Sleep Position study. *Arch Pediatr Adolesc Med*. 2003;157(1):43–49
 20. Fu LY, Colson ER, Corwin MJ, Moon RY. Infant sleep location: associated maternal and infant characteristics with sudden infant death syndrome prevention recommendations. *J Pediatr*. 2008;153(4):503–508
 21. Flick L, White DK, Vemulapalli C, Stulac BB, Kemp JS. Sleep position and the use of soft bedding during bed sharing among African American infants at increased risk for sudden infant death syndrome. *J Pediatr*. 2001;138(3):338–343
 22. Rasinski KA, Kuby A, Bzdusek SA, Silvestri JM, Weese-Mayer DE. Effect of a sudden infant death syndrome risk reduction education program on risk factor compliance and information sources in primarily black urban communities. *Pediatrics*. 2003;111(4 pt 1). Available at: www.pediatrics.org/cgi/content/full/111/4/e347
 23. Osmond C, Murphy M. Seasonality in the sudden infant death syndrome. *Paediatr Perinat Epidemiol*. 1988;2(4):337–345
 24. Malloy MH, Freeman DH. Age at death, season, and day of death as indicators of the effect of the back to sleep program on sudden infant death syndrome in the United States, 1992–1999. *Arch Pediatr Adolesc Med*. 2004;158(4):359–365
 25. Mitchell EA. The changing epidemiology of SIDS following the national risk reduction campaigns. *Pediatr Pulmonol Suppl*. 1997; (16):117–119
 26. Filiano JJ, Kinney HC. A perspective on neuropathologic findings in victims of the sudden infant death syndrome: the triple-risk model. *Biol Neonate*. 1994;65(3–4):194–197
 27. Kinney HC. Brainstem mechanisms underlying the sudden infant death syndrome: evidence from human pathologic studies. *Dev Psychobiol*. 2009;51(3):223–233
 28. Browne CJ, Sharma N, Waters KA, Machaalani R. The effects of nicotine on the alpha-7 and beta-2 nicotinic acetylcholine receptor subunits in the developing piglet brainstem. *Int J Dev Neurosci*. 2010;28(1):1–7
 29. Sekizawa S, Joad JP, Pinkerton KE, Bonham AC. Secondhand smoke exposure alters K⁺ channel function and intrinsic cell excitability in a subset of second-order airway neurons in the nucleus tractus solitarius of young guinea pigs. *Eur J Neurosci*. 2010;31(4):673–684
 30. Duncan JR, Paterson DS, Hoffman JM, et al. Brainstem serotonergic deficiency in sudden infant death syndrome. *JAMA*. 2010;303(5):430–437
 31. Duncan JR, Paterson DS, Kinney HC. The development of nicotinic receptors in the human medulla oblongata: interrelationship with the serotonergic system. *Auton Neurosci*. 2008;144(1–2):61–75
 32. Schneider J, Mitchell I, Singhal N, Kirk V, Hasan SU. Prenatal cigarette smoke exposure attenuates recovery from hypoxemic challenge in preterm infants. *Am J Respir Crit Care Med*. 2008;178(5):520–526
 33. Thiriez G, Bouhaddi M, Mourout L, et al. Heart rate variability in preterm infants and maternal smoking during pregnancy. *Clin Auton Res*. 2009;19(3):149–156
 34. Fifer WP, Fingers ST, Youngman M, Gomez-Gribben E, Myers MM. Effects of alcohol and smoking during pregnancy on infant autonomic control. *Dev Psychobiol*. 2009;51(3):234–242
 35. Richardson HL, Walker AM, Horne RS. Maternal smoking impairs arousal patterns in sleeping infants. *Sleep*. 2009;32(4):515–521
 36. Cohen G, Vella S, Jeffery H, Lagercrantz H, Katz-Salamon M. Cardiovascular stress hyperreactivity in babies of smokers and in babies born preterm. *Circulation*. 2008;118(18):1848–1853
 37. Panigrahy A, Filiano J, Sleeper LA, et al. Decreased serotonergic receptor binding in rhombic lip-derived regions of the medulla oblongata in the sudden infant death syndrome. *J Neuropathol Exp Neurol*. 2000;59(5):377–384
 38. Ozawa Y, Takashima S. Developmental neurotransmitter pathology in the brainstem of sudden infant death syndrome: a review and sleep position. *Forensic Sci Int*. 2002;130(suppl):S53–S59
 39. Kinney HC, Randall LL, Sleeper LA, et al. Serotonergic brainstem abnormalities in Northern Plains Indians with the sudden infant death syndrome. *J Neuropathol Exp Neurol*. 2003;62(11):1178–1191
 40. Machaalani R, Say M, Waters KA. Serotonergic receptor 1A in the sudden infant death syndrome brainstem medulla and associations with clinical risk factors. *Acta Neuropathol (Berl)*. 2009;117(3):257–265
 41. Paterson DS, Trachtenberg FL, Thompson EG, et al. Multiple serotonergic brainstem abnormalities in sudden infant death syndrome. *JAMA*. 2006;296(17):2124–2132
 42. Say M, Machaalani R, Waters KA. Changes in serotonergic receptors 1A and 2A in the piglet brainstem after intermittent hypercapnic hypoxia (IHH) and nicotine. *Brain Res*. 2007;1152:17–26
 43. Kinney HC, Richerson GB, Dymecki SM, Darnall RA, Nattie EE. The brainstem and serotonin in the sudden infant death syndrome. *Annu Rev Pathol*. 2009;4:517–550
 44. Weese-Mayer DE, Ackerman MJ, Marazita ML, Berry-Kravis EM. Sudden infant death syndrome: review of implicated genetic factors. *Am J Med Genet A*. 2007;143A(8):771–788
 45. Opdal SH, Vege A, Rognum TO. Serotonin transporter gene variation in sudden infant death syndrome. *Acta Paediatr*. 2008;97(7):861–865
 46. Paterson DS, Rivera KD, Broadbelt KG, et al. Lack of association of the serotonin transporter polymorphism with the sudden infant death syndrome in the San Diego dataset. *Pediatr Res*. 2010;68(5):409–413
 47. Tan BH, Pundi KN, Van Norstrand DW, et al. Sudden infant death syndrome-associated mutations in the sodium channel beta subunits. *Heart Rhythm*. 2010;7(6):771–778
 48. Ferrante L, Opdal SH, Vege A, Rognum T. Cytokine gene polymorphisms and sudden infant death syndrome. *Acta Paediatr*. 2010;99(3):384–388
 49. Ferrante L, Opdal SH, Vege A, Rognum TO. IL-1 gene cluster polymorphisms and sudden infant death syndrome. *Hum Immunol*. 2010;71(4):402–406
 50. Opdal SH, Rognum TO, Vege A, Stave AK, Dupuy BM, Egeland T. Increased number of substitutions in the D-loop of mitochondrial DNA in the sudden infant death syndrome. *Acta Paediatr*. 1998;87(10):1039–1044
 51. Opdal SH, Rognum TO, Torgersen H, Vege A. Mitochondrial DNA point mutations detected in four cases of sudden infant death syndrome. *Acta Paediatr*. 1999;88(9):957–960
 52. Santorelli FM, Schlessel JS, Slonim AE, Di-

- Mauro S. Novel mutation in the mitochondrial DNA tRNA glycine gene associated with sudden unexpected death. *Pediatr Neurol*. 1996;15(2):145–149
53. Forsyth L, Hume R, Howatson A, Busuttill A, Burchell A. Identification of novel polymorphisms in the glucokinase and glucose-6-phosphatase genes in infants who died suddenly and unexpectedly. *J Mol Med*. 2005;83(8):610–618
54. Kanetake J, Aoki Y, Funayama M. Evaluation of rebreathing potential on bedding for infant use. *Pediatr Int*. 2003;45(3):284–289
55. Kemp JS, Thach BT. Quantifying the potential of infant bedding to limit CO₂ dispersal and factors affecting rebreathing in bedding. *J Appl Physiol*. 1995;78(2):740–745
56. Kemp JS, Livne M, White DK, Arfken CL. Softness and potential to cause rebreathing: differences in bedding used by infants at high and low risk for sudden infant death syndrome. *J Pediatr*. 1998;132(2):234–239
57. Patel AL, Harris K, Thach BT. Inspired CO₂ and O₂ in sleeping infants rebreathing from bedding: relevance for sudden infant death syndrome. *J Appl Physiol*. 2001;91(6):2537–2545
58. Tuffnell CS, Petersen SA, Wailoo MP. Prone sleeping infants have a reduced ability to lose heat. *Early Hum Dev*. 1995;43(2):109–116
59. Ammari A, Schulze KF, Ohira-Kist K, et al. Effects of body position on thermal, cardiorespiratory and metabolic activity in low birth weight infants. *Early Hum Dev*. 2009;85(8):497–501
60. Yiallourou SR, Walker AM, Horne RS. Prone sleeping impairs circulatory control during sleep in healthy term infants: implications for SIDS. *Sleep*. 2008;31(8):1139–1146
61. Wong FY, Witcombe NB, Yiallourou SR, et al. Cerebral oxygenation is depressed during sleep in healthy term infants when they sleep prone. *Pediatrics*. 2011;127(3). Available at: www.pediatrics.org/cgi/content/full/127/3/e558
62. Hauck FR, Herman SM, Donovan M, et al. Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study. *Pediatrics*. 2003;111(5 pt 2):1207–1214
63. Li DK, Petitti DB, Willinger M, et al. Infant sleeping position and the risk of sudden infant death syndrome in California, 1997–2000. *Am J Epidemiol*. 2003;157(5):446–455
64. Blair PS, Fleming PJ, Smith IJ, et al. Babies sleeping with parents: case-control study of factors influencing the risk of the sudden infant death syndrome. CESDI SUDI Research Group. *BMJ*. 1999;319(7223):1457–1462
65. Fleming PJ, Blair PS, Bacon C, et al. Environment of infants during sleep and risk of the sudden infant death syndrome: results of 1993–5 case-control study for confidential inquiry into stillbirths and deaths in infancy. Confidential Enquiry Into Stillbirths and Deaths Regional Coordinators and Researchers. *BMJ*. 1996;313(7051):191–195
66. Carpenter RG, Irgens LM, Blair PS, et al. Sudden unexplained infant death in 20 regions in Europe: case control study. *Lancet*. 2004;363(9404):185–191
67. Mitchell EA, Tuohy PG, Brunt JM, et al. Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: a prospective study. *Pediatrics*. 1997;100(5):835–840
68. Waters KA, Gonzalez A, Jean C, Morielle A, Brouillette RT. Face-straight-down and face-near-straight-down positions in healthy, prone-sleeping infants. *J Pediatr*. 1996;128(5 pt 1):616–625
69. Oyen N, Markestad T, Skjaerven 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
70. Mitchell EA, Thach BT, Thompson JMD, Williams S. Changing infants' sleep position increases risk of sudden infant death syndrome. *Arch Pediatr Adolesc Med*. 1999;153(11):1136–1141
71. National Infant Sleep Position survey database. Available at: http://dccwww.bumc.bu.edu/ChimeNisp/NISP_Data.asp. Accessed September 7, 2010
72. Oden R, Joyner BL, Ajao TI, Moon R. Factors influencing African American mothers' decisions about sleep position: a qualitative study. *J Natl Med Assoc*. 2010;102(10):870–872, 875–880
73. Colson ER, McCabe LK, Fox K, et al. Barriers to following the Back-to-Sleep recommendations: insights from focus groups with inner-city caregivers. *Ambul Pediatr*. 2005;5(6):349–354
74. Mosley JM, Stokes SD, Ulmer A. Infant sleep position: discerning knowledge from practice. *Am J Health Behav*. 2007;31(6):573–582
75. Moon RY, Omon R. Determinants of infant sleep position in an urban population. *Clin Pediatr (Phila)*. 2002;41(8):569–573
76. Ottolini MC, Davis BE, Patel K, Sachs HC, Gershon NB, Moon RY. Prone infant sleeping despite the "Back to Sleep" campaign. *Arch Pediatr Adolesc Med*. 1999;153(5):512–517
77. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ. Factors associated with caregivers' choice of infant sleep position, 1994–1998: the National Infant Sleep Position Study. *JAMA*. 2000;283(16):2135–2142
78. Moon RY, Bilitier WM. Infant sleep position policies in licensed child care centers after Back to Sleep campaign. *Pediatrics*. 2000;106(3):576–580
79. Moon RY, Weese-Mayer DE, Silvestri JM. Nighttime child care: inadequate sudden infant death syndrome risk factor knowledge, practice, and policies. *Pediatrics*. 2003;111(4 pt 1):795–799
80. Von Kohorn I, Corwin MJ, Rybin DV, Heeren TC, Lister G, Colson ER. Influence of prior advice and beliefs of mothers on infant sleep position. *Arch Pediatr Adolesc Med*. 2010;164(4):363–369
81. Byard RW, Beal S. Gastric aspiration and sleeping position in infancy and early childhood. *J Paediatr Child Health*. 2000;36(4):403–405
82. Malloy MH. Trends in postneonatal aspiration deaths and reclassification of sudden infant death syndrome: impact of the "Back to Sleep" program. *Pediatrics*. 2002;109(4):661–665
83. Tablizo MA, Jacinto P, Parsley D, Chen ML, Ramanathan R, Keens TG. Supine sleeping position does not cause clinical aspiration in neonates in hospital newborn nurseries. *Arch Pediatr Adolesc Med*. 2007;161(5):507–510
84. Vandenplas Y, Rudolph CD, Di Lorenzo C, et al. Pediatric gastroesophageal reflux clinical practice guidelines: joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN). *J Pediatr Gastroenterol Nutr*. 2009;49(4):498–547
85. Meyers WF, Herbst JJ. Effectiveness of positioning therapy for gastroesophageal reflux. *Pediatrics*. 1982;69(6):768–772
86. Tobin JM, McCloud P, Cameron DJ. Posture and gastro-oesophageal reflux: a case for left lateral positioning. *Arch Dis Child*. 1997;76(3):254–258
87. Kahn A, Groswasser J, Sottiaux M, Rebuffat E, Franco P, Dramaix M. Prone or supine body position and sleep characteristics in infants. *Pediatrics*. 1993;91(6):1112–1115

88. Bhat RY, Hannam S, Pressler R, Rafferty GF, Peacock JL, Greenough A. Effect of prone and supine position on sleep, apneas, and arousal in preterm infants. *Pediatrics*. 2006;118(1):101–107
89. Ariagno RL, van Liempt S, Mirmiran M. Fewer spontaneous arousals during prone sleep in preterm infants at 1 and 3 months corrected age. *J Perinatol*. 2006;26(5):306–312
90. Franco P, Groswasser J, Sottiaux M, Broadfield E, Kahn A. Decreased cardiac responses to auditory stimulation during prone sleep. *Pediatrics*. 1996;97(2):174–178
91. Galland BC, Reeves G, Taylor BJ, Bolton DP. Sleep position, autonomic function, and arousal. *Arch Dis Child Fetal Neonatal Ed*. 1998;78(3):F189–F194
92. Galland BC, Hayman RM, Taylor BJ, Bolton DP, Sayers RM, Williams SM. Factors affecting heart rate variability and heart rate responses to tilting in infants aged 1 and 3 months. *Pediatr Res*. 2000;48(3):360–368
93. Horne RS, Ferens D, Watts AM, et al. The prone sleeping position impairs arousability in term infants. *J Pediatr*. 2001;138(6):811–816
94. Horne RS, Bandopadhyay P, Vitkovic J, Cranage SM, Adamson TM. Effects of age and sleeping position on arousal from sleep in preterm infants. *Sleep*. 2002;25(7):746–750
95. Kato I, Scaillet S, Groswasser J, et al. Spontaneous arousability in prone and supine position in healthy infants. *Sleep*. 2006;29(6):785–790
96. Phillipson EA, Sullivan CC. Arousal: the forgotten response to respiratory stimuli. *Am Rev Respir Dis*. 1978;118(5):807–809
97. Kahn A, Groswasser J, Rebuffat E, et al. Sleep and cardiorespiratory characteristics of infant victims of sudden death: a prospective case-control study. *Sleep*. 1992;15(4):287–292
98. Schechtman VL, Harper RM, Wilson AJ, Southall DP. Sleep state organization in normal infants and victims of the sudden infant death syndrome. *Pediatrics*. 1992;89(5 pt 1):865–870
99. Harper RM. State-related physiological changes and risk for the sudden infant death syndrome. *Aust Paediatr J*. 1986;22(suppl 1):55–58
100. Kato I, Franco P, Groswasser J, et al. Incomplete arousal processes in infants who were victims of sudden death. *Am J Respir Crit Care Med*. 2003;168(11):1298–1303
101. Malloy MH, Hoffman HJ. Prematurity, sudden infant death syndrome, and age of death. *Pediatrics*. 1995;96(3 pt 1):464–471
102. Sowter B, Doyle LW, Morley CJ, Altmann A, Halliday J. Is sudden infant death syndrome still more common in very low birthweight infants in the 1990s? *Med J Aust*. 1999;171(8):411–413
103. American Academy of Pediatric, Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. *Pediatrics*. 2008;122(5):1119–1126
104. Vernacchio L, Corwin MJ, Lesko SM, et al. Sleep position of low birth weight infants. *Pediatrics*. 2003;111(3):633–640
105. Pollack HA, Frohna JG. Infant sleep placement after the Back to Sleep campaign. *Pediatrics*. 2002;109(4):608–614
106. Baird TM, Paton JB, Fisher DE. Improved oxygenation with prone positioning in neonates: stability of increased transcutaneous P_{O_2} . *J Perinatol*. 1991;11(4):315–317
107. Martin RJ, DiFiore JM, Korenke CB, Randal H, Miller MJ, Brooks LJ. Vulnerability of respiratory control in healthy preterm infants placed supine. *J Pediatr*. 1995;127(4):609–614
108. Levy J, Habib RH, Liptsen E, et al. Prone versus supine positioning in the well preterm infant: Effects on work of breathing and breathing patterns. *Pediatr Pulmonol*. 2006;41(8):754–758
109. Grazel R, Phalen AG, Polomano RC. Implementation of the American Academy of Pediatrics recommendations to reduce sudden infant death syndrome risk in neonatal intensive care units: an evaluation of nursing knowledge and practice. *Adv Neonatal Care*. 2010;10(6):332–342
110. Moon RY, Oden RP, Joyner BL, Ajao TI. Qualitative analysis of beliefs and perceptions about sudden infant death syndrome (SIDS) among African-American mothers: implications for safe sleep recommendations. *J Pediatr*. 2010;157(1):92–97.e2
111. Brenner R, Simons-Morton BG, Bhaskar B, et al. Prevalence and predictors of the prone sleep position among inner-city infants. *JAMA*. 1998;280(4):341–346
112. Willinger M, Hoffman HJ, Wu KT, et al. Factors associated with the transition to non-prone sleep positions of infants in the United States: the National Infant Sleep Position Study. *JAMA*. 1998;280(4):329–335
113. Hutchison BL, Thompson JM, Mitchell EA. Determinants of nonsynostotic plagiocephaly: a case-control study. *Pediatrics*. 2003;112(4). Available at: www.pediatrics.org/cgi/content/full/112/4/e316
114. Hutchison BL, Hutchison LA, Thompson JM, Mitchell EA. Plagiocephaly and brachycephaly in the first two years of life: a prospective cohort study. *Pediatrics*. 2004;114(4):970–980
115. van Vlimmeren LA, van der Graaf Y, Boere-Boonekamp MM, L'Hoir MP, Helden PJ, Engelbert RH. Risk factors for deformational plagiocephaly at birth and at 7 weeks of age: a prospective cohort study. *Pediatrics*. 2007;119(2). Available at: www.pediatrics.org/cgi/content/full/119/2/e408
116. Miller RI, Clarren SK. Long-term developmental outcomes in patients with deformational plagiocephaly. *Pediatrics*. 2000;105(2). Available at: www.pediatrics.org/cgi/content/full/105/2/e26
117. Panchal J, Amirshaybani H, Gurwitsch R, et al. Neurodevelopment in children with single-suture craniosynostosis and plagiocephaly without synostosis. *Plast Reconstr Surg*. 2001;108(6):1492–1498; discussion 1499–1500
118. Balan P, Kushnerenko E, Sahlin P, Huotilainen M, Naatanen R, Hukki J. Auditory ER: Ps reveal brain dysfunction in infants with plagiocephaly. *J Craniofac Surg*. 2002;13(4):520–525; discussion 526
119. Chaddock WM, Kast J, Donahue DJ. The enigma of lambdoid positional molding. *Pediatr Neurosurg*. 1997;26(6):304–311
120. Laughlin J, Luerssen TG, Dias MS; American Academy of Pediatrics, Committee on Practice and Ambulatory Medicine, Section on Neurological Surgery. Clinical report—prevention and management of positional skull deformities in infants. *Pediatrics*. 2011;128(6). In press
121. US Consumer Product Safety Commission. Crib Safety Tips: Use Your Crib Safely. Washington, DC: US Consumer Product Safety Commission. CPSC document 5030
122. Pike J, Moon RY. Bassinet use and sudden unexpected death in infancy. *J Pediatr*. 2008;153(4):509–512
123. Jackson A, Moon RY. An analysis of deaths in portable cribs and playpens: what can be learned? *Clin Pediatr (Phila)*. 2008;47(3):261–266
124. Nakamura S, Wind M, Danello MA. Review of hazards associated with children placed in adult beds. *Arch Pediatr Adolesc Med*. 1999;153(10):1019–1023
125. US Consumer Product Safety Commission. Staff Briefing Package, Draft Proposed Rule for Portable Bed Rails (CPSIA Section 104). Bethesda, MD: US Consumer Product Safety Commission; 2011
126. Callahan CW, Sisler C. Use of seating devices in infants too young to sit. *Arch Pediatr Adolesc Med*. 1997;151(3):233–235
127. Orenstein SR, Whittington PF, Orenstein DM.

The infant seat as treatment for gastroesophageal reflux. *N Engl J Med*. 1983; 309(13):760–763

128. Bass JL, Bull M. Oxygen desaturation in term infants in car safety seats. *Pediatrics*. 2002;110(2 pt 1):401–402
129. Cerar LK, Scirica CV, Stucin Gantar I, Osredkar D, Neubauer D, Kinane TB. A comparison of respiratory patterns in healthy term infants placed in car safety seats and beds. *Pediatrics*. 2009;124(3). Available at: www.pediatrics.org/cgi/content/full/124/3/e396
130. Côté A, Bairam A, Deschenes M, Hatzakis G. Sudden infant deaths in sitting devices. *Arch Dis Child*. 2008;93(5):384–389
131. Merchant JR, Worwa C, Porter S, Coleman JM, deRegnier RA. Respiratory instability of term and near-term healthy newborn infants in car safety seats. *Pediatrics*. 2001;108(3):647–652
132. Willett LD, Leuschen MP, Nelson LS, Nelson RM Jr. Risk of hypoventilation in premature infants in car seats. *J Pediatr*. 1986; 109(2):245–248
133. Desapriya EB, Joshi P, Subzwari S, Nolan M. Infant injuries from child restraint safety seat misuse at British Columbia Children's Hospital. *Pediatr Int*. 2008;50(5):674–678
134. Graham CJ, Kittredge D, Stuemky JH. Injuries associated with child safety seat misuse. *Pediatr Emerg Care*. 1992;8(6): 351–353
135. Parikh SN, Wilson L. Hazardous use of car seats outside the car in the United States, 2003–2007. *Pediatrics*. 2010;126(2): 352–357
136. Pollack-Nelson C. Fall and suffocation injuries associated with in-home use of car seats and baby carriers. *Pediatr Emerg Care*. 2000;16(2):77–79
137. Wickham T, Abrahamson E. Head injuries in infants: the risks of bouncy chairs and car seats. *Arch Dis Child*. 2002;86(3):168–169
138. US Consumer Product Safety Commission. *Infant Deaths Prompt CPSC Warning About Sling Carriers for Babies*. Washington, DC: US Consumer Product Safety Commission; 2010
139. McKenna JJ, Thoman EB, Anders TF, Sadeh A, Schechtman VL, Glotzbach SF. Infant-parent co-sleeping in an evolutionary perspective: implications for understanding infant sleep development and the sudden infant death syndrome. *Sleep*. 1993; 16(3):263–282
140. McKenna JJ, Ball HL, Gettler LT. Mother-infant cosleeping, breastfeeding and sudden infant death syndrome: what biological anthropology has discovered about normal infant sleep and pediatric sleep medicine. *Am J Phys Anthropol*. 2007; (suppl 45):133–161
141. McKenna J. *Sleeping With Your Baby: A Parent's Guide to Cosleeping*. Washington, DC: Platyus Media, LLC; 2007
142. Mitchell EA, Thompson JMD. Co-sleeping increases the risk of SIDS, but sleeping in the parents' bedroom lowers it. In: Rognum TO, ed. *Sudden Infant Death Syndrome: New Trends in the Nineties*. Oslo, Norway: Scandinavian University Press; 1995:266–269
143. Tappin D, Ecob R, Brooke H. Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: a case control study. *J Pediatr*. 2005;147(1):32–37
144. Joyner BL, Oden R, Ajao TI, Moon R. Where should my baby sleep? A qualitative study of African-American infant sleep location decisions. *J Natl Med Assoc*. 2010;102(10): 881–889
145. Mosko S, Richard C, McKenna J. Infant arousals during mother-infant bed sharing: implications for infant sleep and sudden infant death syndrome research. *Pediatrics*. 1997;100(5):841–849
146. McKenna JJ, Mosko S, Richard CA. Bed-sharing promotes breastfeeding. *Pediatrics*. 1997;100(2 pt 1):214–219
147. Scheers NJ, Dayton CM, Kemp JS. Sudden infant death with external airways covered: case-comparison study of 206 deaths in the United States. *Arch Pediatr Adolesc Med*. 1998;152(6):540–547
148. Unger B, Kemp JS, Wilkins D, et al. Racial disparity and modifiable risk factors among infants dying suddenly and unexpectedly. *Pediatrics*. 2003;111(2). Available at: www.pediatrics.org/cgi/content/full/111/2/e127
149. Kemp JS, Unger B, Wilkins D, et al. Unsafe sleep practices and an analysis of bed-sharing among infants dying suddenly and unexpectedly: results of a four-year, population-based, death-scene investigation study of sudden infant death syndrome and related deaths. *Pediatrics*. 2000;106(3). Available at: www.pediatrics.org/cgi/content/full/106/3/e41
150. Drago DA, Dannenberg AL. Infant mechanical suffocation deaths in the United States, 1980–1997. *Pediatrics*. 1999;103(5). Available at: www.pediatrics.org/cgi/content/full/103/5/e59
151. Baddock SA, Galland BC, Beckers MG, et al. Bed-sharing and the infant's thermal environment in the home setting. *Arch Dis Child*. 2004;89(12):1111–1116
152. Baddock SA, Galland BC, Bolton DP, Williams SM, Taylor BJ. Differences in infant and parent behaviors during routine bed sharing compared with cot sleeping in the home setting. *Pediatrics*. 2006;117(5): 1599–1607
153. McIntosh CG, Tonkin SL, Gunn AJ. What is the mechanism of sudden infant deaths associated with co-sleeping? *N Z Med J*. 2009;122(1307):69–75
154. Blair PS, Mitchell EA, Heckstall-Smith EM, Fleming PJ. Head covering: a major modifiable risk factor for sudden infant death syndrome—a systematic review. *Arch Dis Child*. 2008;93(9):778–783
155. Baddock SA, Galland BC, Taylor BJ, Bolton DP. Sleep arrangements and behavior of bed-sharing families in the home setting. *Pediatrics*. 2007;119(1). Available at: www.pediatrics.org/cgi/content/full/119/1/e200
156. Ball H. Airway covering during bed-sharing. *Child Care Health Dev*. 2009;35(5): 728–737
157. American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome. Changing concepts of sudden infant death syndrome: implications for infant sleeping environment and sleep position. *Pediatrics*. 2000; 105(3 pt 1):650–656
158. Vennemann M, Hense HW, Bajanowski T, et al. Bed sharing and the risk of SIDS: can we resolve the debate? *J Pediatr*. 2011; In press
159. Ostfeld BM, Perl H, Esposito L, et al. Sleep environment, positional, lifestyle, and demographic characteristics associated with bed sharing in sudden infant death syndrome cases: a population-based study. *Pediatrics*. 2006;118(5):2051–2059
160. Scheers NJ, Rutherford GW, Kemp JS. Where should infants sleep? A comparison of risk for suffocation of infants sleeping in cribs, adult beds, and other sleeping locations. *Pediatrics*. 2003;112(4):883–889
161. Blair P, Ward Platt MP, Smith IJ, Fleming PJ. Sudden infant death syndrome and sleeping position in pre-term and low birthweight infants: an opportunity for targeted intervention. *Arch Dis Child*. 2006; 91(2):101–106
162. Lin RG. Infant deaths prompt warning. *Los Angeles Times*. April 24, 2008. Available at: <http://articles.latimes.com/2008/apr/24/local/me-deaths24>. Accessed September 6, 2011
163. Cambria N. Officials issue warning to prevent infant death. *St Louis Post-Dispatch*. January 24, 2009. Available at: www.stltoday.com/news/article_738ffce-5343-534c-bf89-0582e440adf5.html. Accessed September 20, 2011

164. Department of Human Services. *DHS and Health Department Launch New Campaign Warning to Parents* [press release]. Philadelphia, PA: Department of Human Services; 2007. Available at: www.phila.gov/dhs/news_sleepingSafely.html. Accessed September 6, 2011
165. Brewington K. Don't share the bed with infant, parents told. *Baltimore Sun*. January 26, 2009
166. Arnestad M, Andersen M, Vege A, Rognum TO. Changes in the epidemiological pattern of sudden infant death syndrome in south-east Norway, 1984–1998: implications for future prevention and research. *Arch Dis Child*. 2001;85(2):108–115
167. Scragg R, Mitchell EA, Taylor BJ, et al. Bed sharing, smoking, and alcohol in the sudden infant death syndrome. New Zealand Cot Death Study Group. *BMJ*. 1993;307(6915):1312–1318
168. McGarvey C, McDonnell M, Hamilton K, O'Regan M, Matthews T. An 8 year study of risk factors for SIDS: bed-sharing vs. non bed-sharing. *Arch Dis Child*. 2006;91(4):318–323
169. McGarvey C, McDonnell M, Chong A, O'Regan M, Matthews T. Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland. *Arch Dis Child*. 2003;88(12):1058–1064
170. Fu LY, Moon R, Hauck FR. Bed sharing among black infants and sudden infant death syndrome: interactions with other known risk factors. *Acad Pediatr*. 2010;10(6):376–382
171. Blair PS, Sidebotham P, Evason-Coombe C, Edmonds M, Heckstall-Smith EM, Fleming P. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 2009;339:b3666
172. Carroll-Pankhurst C, Mortimer EAJ. Sudden infant death syndrome, bedsharing, parental weight, and age at death. *Pediatrics*. 2001;107(3):530–536
173. Mitchell E, Thompson J. Who cosleeps? Does high maternal body weight and duvet use increase the risk of sudden infant death syndrome when bed sharing? *Paediatr Child Health*. 2006;11(suppl):14A–15A
174. Hutchison BL, Stewart AW, Mitchell EA. The prevalence of cobedding and SIDS-related child care practices in twins. *Eur J Pediatr*. 2010;169(12):1477–1485
175. Hayward K. Cobedding of twins: a natural extension of the socialization process? *MCN Am J Matern Child Nurs*. 2003;28(4):260–263
176. Tomashek KM, Wallman C; American Academy of Pediatrics, Committee on Fetus and Newborn. Cobedding twins and higher-order multiples in a hospital setting [published correction appears in *Pediatrics*. 2008;121(1):227]. *Pediatrics*. 2007;120(6):1359–1366
177. National Association of Neonatal Nurses Board of Directors. NANN position statement 3045: cobedding of twins or higher-order multiples. *Adv Neonatal Care*. 2009;9(6):307–313
178. Moon RY, Oden RP, Joyner BL, Ajao TI. Reasons that African-American parents use soft bedding and soft sleep surfaces for their infants [abstract]. *J Paediatr Child Health*. 2010;16(suppl 3):43
179. Chiodini BA, Thach BT. Impaired ventilation in infants sleeping facedown: potential significance for sudden infant death syndrome. *J Pediatr*. 1993;123(5):686–692
180. Kemp JS, Nelson VE, Thach BT. Physical properties of bedding that may increase risk of sudden infant death syndrome in prone-sleeping infants. *Pediatr Res*. 1994;36(1 pt 1):7–11
181. Sakai J, Kanetake J, Takahashi S, Kanawaku Y, Funayama M. Gas dispersal potential of bedding as a cause for sudden infant death. *Forensic Sci Int*. 2008;180(2–3):93–97
182. Ponsonby AL, Dwyer T, Gibbons LE, Cochrane JA, Wang YG. Factors potentiating the risk of sudden infant death syndrome associated with the prone position. *N Engl J Med*. 1993;329(6):377–382
183. Mitchell EA, Thompson JMD, Ford RPK, Taylor BJ. Sheepskin bedding and the sudden infant death syndrome. New Zealand Cot Death Study Group. *J Pediatr*. 1998;133(5):701–704
184. Brooke H, Gibson A, Tappin D, Brown H. Case-control study of sudden infant death syndrome in Scotland, 1992–5. *BMJ*. 1997;314(7093):1516–1520
185. Kemp JS, Kowalski RM, Burch PM, Graham MA, Thach BT. Unintentional suffocation by rebreathing: a death scene and physiologic investigation of a possible cause of sudden infant death. *J Pediatr*. 1993;122(6):874–880
186. Ponsonby AL, Dwyer T, Couper D, Cochrane J. Association between use of a quilt and sudden infant death syndrome: case-control study. *BMJ*. 1998;316(7126):195–196
187. Mitchell EA, Scragg L, Clements M. Soft cot mattresses and the sudden infant death syndrome. *N Z Med J*. 1996;109(1023):206–207
188. L'Hoir MP, Engelberts AC, van Well GTJ, et al. Risk and preventive factors for cot death in the Netherlands, a low-incidence country. *Eur J Pediatr*. 1998;157(8):681–688
189. Markestad T, Skadberg B, Hordvik E, Mørild I, Irgens L. Sleeping position and sudden infant death syndrome (SIDS): effect of an intervention programme to avoid prone sleeping. *Acta Paediatr*. 1995;84(4):375–378
190. Beal SM, Byard RW. Accidental death or sudden infant death syndrome? *J Paediatr Child Health*. 1995;31(4):269–271
191. Wilson CA, Taylor BJ, Laing RM, Williams SM, Mitchell EA. Clothing and bedding and its relevance to sudden infant death syndrome: further results from the New Zealand Cot Death Study. *J Paediatr Child Health*. 1994;30(6):506–512
192. Chowdhury RT. *Nursery Product-Related Injuries and Deaths Among Children Under Age Five*. Washington, DC: US Consumer Product Safety Commission; 2009
193. Chowdhury RT. *Nursery Product-Related Injuries and Deaths Among Children Under Age Five*. Washington, DC: US Consumer Product Safety Commission; 2010
194. US Food and Drug Administration. CPSC and FDA warn against using infant sleep positioners because of suffocation risk: initial communication. Available at: www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm227301.htm. Accessed September 6, 2011
195. Moon RY. "And things that go bump in the night": nothing to fear? *J Pediatr*. 2007;151(3):237–238
196. Thach BT, Rutherford GW, Harris K. Deaths and injuries attributed to infant crib bumper pads. *J Pediatr*. 2007;151(3):271–274
197. Yeh ES, Rochette LM, McKenzie LB, Smith GA. Injuries associated with cribs, playpens, and bassinets among young children in the US, 1990–2008. *Pediatrics*. 2011;127(3):479–486
198. Kraus JF, Greenland S, Bulterys M. Risk factors for sudden infant death syndrome in the US Collaborative Perinatal Project. *Int J Epidemiol*. 1989;18(1):113–120
199. Paris C, Remler R, Daling JR. Risk factors for sudden infant death syndrome: changes associated with sleep position recommendations. *J Pediatr*. 2001;139(6):771–777
200. Stewart A, Williams S, Mitchell E, Taylor BJ, Ford R, Allen EM. Antenatal and intrapartum factors associated with sudden infant death syndrome in the New Zealand Cot Death Study. *J Paediatr Child Health*. 1995;31(5):473–478

201. MacDorman MF, Cnattingius S, Hoffman HJ, Kramer MS, Haglund B. Sudden infant death syndrome and smoking in the United States and Sweden. *Am J Epidemiol*. 1997; 146(3):249–257
202. Schoendorf KC, Kiely JL. Relationship of sudden infant death syndrome to maternal smoking during and after pregnancy. *Pediatrics*. 1992;90(6):905–908
203. Malloy MH, Kleinman JC, Land GH, Schramm WF. The association of maternal smoking with age and cause of infant death. *Am J Epidemiol*. 1988;128(1):46–55
204. Haglund B, Cnattingius S. Cigarette smoking as a risk factor for sudden infant death syndrome: a population-based study. *Am J Public Health*. 1990;80(1):29–32
205. Mitchell EA, Ford RP, Stewart AW, et al. Smoking and the sudden infant death syndrome. *Pediatrics*. 1993;91(5):893–896
206. Winickoff JP, Friebely J, Tanski SE, et al. Beliefs about the health effects of “third-hand” smoke and home smoking bans. *Pediatrics*. 2009;123(1). Available at: www.pediatrics.org/cgi/content/full/123/1/e74
207. Tirosh E, Libon D, Bader D. The effect of maternal smoking during pregnancy on sleep respiratory and arousal patterns in neonates. *J Perinatol*. 1996;16(6):435–438
208. Franco P, Groswasser J, Hassid S, Lanquart JP, Scaillet S, Kahn A. Prenatal exposure to cigarette smoking is associated with a decrease in arousal in infants. *J Pediatr*. 1999;135(1):34–38
209. Horne RS, Ferens D, Watts AM, et al. Effects of maternal tobacco smoking, sleeping position, and sleep state on arousal in healthy term infants. *Arch Dis Child Fetal Neonatal Ed*. 2002;87(2):F100–F105
210. Sawani H, Jackson T, Murphy T, Beckerman R, Simakajornboon N. The effect of maternal smoking on respiratory and arousal patterns in preterm infants during sleep. *Am J Respir Crit Care Med*. 2004; 169(6):733–738
211. Lewis KW, Bosque EM. Deficient hypoxia awakening response in infants of smoking mothers: possible relationship to sudden infant death syndrome. *J Pediatr*. 1995; 127(5):691–699
212. Chang AB, Wilson SJ, Masters IB, et al. Altered arousal response in infants exposed to cigarette smoke. *Arch Dis Child*. 2003; 88(1):30–33
213. Parsiow PM, Cranage SM, Adamson TM, Harding R, Horne RS. Arousal and ventilatory responses to hypoxia in sleeping infants: effects of maternal smoking. *Respir Physiol Neurobiol*. 2004;140(1):77–87
214. Mitchell EA, Milerad J. Smoking and the sudden infant death syndrome. *Rev Environ Health*. 2006;21(2):81–103
215. Dietz PM, England LJ, Shapiro-Mendoza CK, Tong VT, Farr SL, Callaghan WM. Infant morbidity and mortality attributable to prenatal smoking in the U.S. *Am J Prev Med*. 2010;39(1):45–52
216. American Academy of Pediatrics, Committee on Environmental Health; Committee on Substance Abuse; Committee on Adolescence; Committee on Native American Child. Policy statement—tobacco use: a pediatric disease [published correction appears in *Pediatrics*. 2010;125(4):861]. *Pediatrics*. 2009;124(5):1474–1487
217. Best D; Committee on Environmental Health; Committee on Native American Child Health; Committee on Adolescence. Technical report—secondhand and prenatal tobacco smoke exposure. *Pediatrics*. 2009;124(5). Available at: www.pediatrics.org/cgi/content/full/124/5/e1017
218. Iyasu S, Randall LL, Welty TK, et al. Risk factors for sudden infant death syndrome among Northern Plains Indians. *JAMA*. 2002;288(21):2717–2723
219. Strandberg-Larsen K, Gronboek M, Andersen AM, Andersen PK, Olsen J. Alcohol drinking pattern during pregnancy and risk of infant mortality. *Epidemiology*. 2009;20(6):884–891
220. Alm B, Wennergren G, Norvenius G, et al. Caffeine and alcohol as risk factors for sudden infant death syndrome. Nordic Epidemiological SIDS Study. *Arch Dis Child*. 1999;81(2):107–111
221. James C, Klenka H, Manning D. Sudden infant death syndrome: bed sharing with mothers who smoke. *Arch Dis Child*. 2003; 88(2):112–113
222. Klonoff-Cohen H, Edelstein SL. Bed sharing and the sudden infant death syndrome. *BMJ*. 1995;311(7015):1269–1272
223. Rajegowda BK, Kandall SR, Falciglia H. Sudden unexpected death in infants of narcotic-dependent mothers. *Early Hum Dev*. 1978;2(3):219–225
224. Chavez CJ, Ostrea EM Jr, Stryker JC, Smialek Z. Sudden infant death syndrome among infants of drug-dependent mothers. *J Pediatr*. 1979;95(3):407–409
225. Bauchner H, Zuckerman B, McClain M, Frank D, Fried LE, Kayne H. Risk of sudden infant death syndrome among infants with in utero exposure to cocaine. *J Pediatr*. 1988;113(5):831–834
226. Durand DJ, Espinoza AM, Nickerson BG. Association between prenatal cocaine exposure and sudden infant death syndrome. *J Pediatr*. 1990;117(6):909–911
227. Ward SL, Bautista D, Chan L, et al. Sudden infant death syndrome in infants of substance-abusing mothers. *J Pediatr*. 1990;117(6):876–881
228. Rosen TS, Johnson HL. Drug-addicted mothers, their infants, and SIDS. *Ann NY Acad Sci*. 1988;533:89–95
229. Kandall SR, Gaines J, Habel L, Davidson G, Jessop D. Relationship of maternal substance abuse to subsequent sudden infant death syndrome in offspring. *J Pediatr*. 1993;123(1):120–126
230. Fares I, McCulloch KM, Raju TN. Intrauterine cocaine exposure and the risk for sudden infant death syndrome: a meta-analysis. *J Perinatol*. 1997;17(3):179–182
231. Tappin D, Brooke H, Ecob R, Gibson A. Used infant mattresses and sudden infant death syndrome in Scotland: case-control study. *BMJ*. 2002;325(7371):1007–1012
232. Ford RP, Taylor BJ, Mitchell EA, et al. Breastfeeding and the risk of sudden infant death syndrome. *Int J Epidemiol*. 1993; 22(5):885–890
233. Hoffman HJ, Damus K, Hillman L, Krongrad E. Risk factors for SIDS: results of the National Institute of Child Health and Human Development SIDS Cooperative Epidemiological Study. *Ann NY Acad Sci*. 1988;533: 13–30
234. Henderson-Smart DJ, Ponsonby AL, Murphy E. Reducing the risk of sudden infant death syndrome: a review of the scientific literature. *J Paediatr Child Health*. 1998; 34(3):213–219
235. Ponsonby AL, Dwyer T, Kasl SV, Cochrane JA. The Tasmanian SIDS Case-Control Study: univariable and multivariable risk factor analysis. *Paediatr Perinat Epidemiol*. 1995;9(3):256–272
236. Alm B, Wennergren G, Norvenius SG, et al. Breast feeding and the sudden infant death syndrome in Scandinavia, 1992–95. *Arch Dis Child*. 2002;86(6):400–402
237. McVea KLSP, Turner PD, Peppler DK. The role of breastfeeding in sudden infant death syndrome. *J Hum Lact*. 2000;16(1): 13–20
238. Gilbert RE, Wighfield RE, Fleming PJ, Berry PJ, Rudd PT. Bottle feeding and the sudden infant death syndrome. *BMJ*. 1995; 310(6972):88–90
239. l’Hoir MP, Engelberts AC, van Well GTJ, et al. Case-control study of current validity of previously described risk factors for SIDS in the Netherlands. *Arch Dis Child*. 1998; 79(5):386–393
240. Wennergren G, Alm B, Oyen N, et al. The decline in the incidence of SIDS in Scandinavia and its relation to risk-intervention

- campaigns. Nordic Epidemiological SIDS Study. *Acta Paediatr*. 1997;86(9):963–968
241. Biering-Sørensen F, Jørgensen T, Hilden J. Sudden infant death in Copenhagen 1956–1971: I. Infant feeding. *Acta Paediatr Scand*. 1978;67(2):129–137
 242. Watson E, Gardner A, Carpenter RG. An epidemiological and sociological study of unexpected death in infancy in nine areas of southern England. I: Epidemiology. *Med Sci Law*. 1981;21(2):78–88
 243. Ip S, Chung M, Raman G, Trikalinos TA, Lau J. A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries. *Breastfeed Med*. 2009;4(suppl 1):S17–S30
 244. Vennemann MM, Bajanowski T, Brinkmann B, et al; GeSID Study Group. Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics*. 2009;123. Available at: www.pediatrics.org/cgi/content/full/123/3/e406
 245. Hauck FR, Thompson J, Tanabe KO, Moon RY, Vennemann M. Breastfeeding and reduced risk of sudden infant death syndrome: a meta-analysis. *Pediatrics*. 2011;128(1):103–110
 246. Centers for Disease Control and Prevention. Racial and ethnic differences in breastfeeding initiation and duration, by state: National Immunization Survey, United States, 2004–2008. *MMWR Morb Mortal Wkly Rep*. 2010;59(11):327–334
 247. Franco P, Scaillet S, Wermenbol V, Valente F, Groswasser J, Kahn A. The influence of a pacifier on infants' arousals from sleep. *J Pediatr*. 2000;136(6):775–779
 248. Horne RS, Parslow PM, Ferens D, Watts AM, Adamson TM. Comparison of evoked arousability in breast and formula fed infants. *Arch Dis Child*. 2004;89(1):22–25
 249. Duijts L, Jaddoe VW, Hofman A, Moll HA. Prolonged and exclusive breastfeeding reduces the risk of infectious diseases in infancy. *Pediatrics*. 2010;126(1). Available at: www.pediatrics.org/cgi/content/full/126/1/e18
 250. Heinig MJ. Host defense benefits of breastfeeding for the infant: effect of breastfeeding duration and exclusivity. *Pediatr Clin North Am*. 2001;48(1):105–123, ix
 251. Kramer MS, Guo T, Platt RW, et al. Infant growth and health outcomes associated with 3 compared with 6 mo of exclusive breastfeeding. *Am J Clin Nutr*. 2003;78(2):291–295
 252. Academy of Breastfeeding Medicine Protocol Committee. ABM clinical protocol #6: guideline on co-sleeping and breastfeed-
 - ing. Revision, March 2008. *Breastfeed Med*. 2008;3(1):38–43
 253. McKenna J. Sleeping with your baby. *New Beginnings (La Leche League International)*. 2009;26(1):4–9
 254. Hauck FR, Signore C, Fein SB, Raju TN. Infant sleeping arrangements and practices during the first year of life. *Pediatrics*. 2008;122(suppl 2):S113–S120
 255. Horsley T, Clifford T, Barrowman N, et al. Benefits and harms associated with the practice of bed sharing: a systematic review. *Arch Pediatr Adolesc Med*. 2007;161(3):237–245
 256. Hauck FR, Signore C, Fein SB, Raju TN. Infant feeding practices and mother-infant bed sharing: is there an association? Results from the Infant Feeding Practices Study II [abstract]. Presented at: American Public Health Association annual meeting; October 25, 2007; Washington, DC
 257. Vogel A, Hutchison BL, Mitchell EA. Factors associated with the duration of breastfeeding. *Acta Paediatr*. 1999;88(12):1320–1326
 258. Ruys JH, de Jonge GA, Brand R, Engelberts AC, Semmekrot BA. Bed-sharing in the first four months of life: a risk factor for sudden infant death. *Acta Paediatr*. 2007;96(10):1399–1403
 259. Arnestad M, Andersen M, Rognum TO. Is the use of dummy or carry-cot of importance for sudden infant death? *Eur J Pediatr*. 1997;156(12):968–970
 260. Mitchell EA, Taylor BJ, Ford RPK, et al. Dummies and the sudden infant death syndrome. *Arch Dis Child*. 1993;68(4):501–504
 261. Fleming PJ, Blair PS, Pollard K, et al. Pacifier use and sudden infant death syndrome: results from the CESDI/SUDI case control study. CESDI SUDI Research Team. *Arch Dis Child*. 1999;81(2):112–116
 262. L'Hoir MP, Engleberts AC, van Well GTJ, et al. Dummy use, thumb sucking, mouth breathing and cot death. *Eur J Pediatr*. 1999;158(11):896–901
 263. Hauck FR, Omojokun OO, Siadaty MS. Do pacifiers reduce the risk of sudden infant death syndrome? A meta-analysis. *Pediatrics*. 2005;116(5). Available at: www.pediatrics.org/cgi/content/full/116/5/e716
 264. Mitchell EA, Blair PS, L'Hoir MP. Should pacifiers be recommended to prevent SIDS? *Pediatrics*. 2006;117(5):1755–1758
 265. Li DK, Willinger M, Petitti DB, Odouli R, Liu L, Hoffman HJ. Use of a dummy (pacifier) during sleep and risk of sudden infant death syndrome (SIDS): population based case-control study. *BMJ*. 2006;332(7532):18–22
 266. Vennemann MM, Bajanowski T, Brinkmann B, Jorch G, Sauerland C, Mitchell EA; GeSID Study Group. Sleep environment risk factors for sudden infant death syndrome: the German Sudden Infant Death Syndrome Study. *Pediatrics*. 2009;123(4):1162–1170
 267. Kahn A, Sawaguchi T, Sawaguchi A, et al. Sudden infant deaths: from epidemiology to physiology. *Forensic Sci Int*. 2002;130(suppl):S8–S20
 268. Franco P, Chabanski S, Scaillet S, Groswasser J, Kahn A. Pacifier use modifies infant's cardiac autonomic controls during sleep. *Early Hum Dev*. 2004;77(1–2):99–108
 269. Tonkin SL, Lui D, McIntosh CG, Rowley S, Knight DB, Gunn AJ. Effect of pacifier use on mandibular position in preterm infants. *Acta Paediatr*. 2007;96(10):1433–1436
 270. Horne RS, Witcombe NB, Yiallourou SR, Richardson HL. Sudden infant death syndrome: implications of altered physiological control during sleep. *Curr Pediatr Rev*. 2010;6(1):30–38
 271. Weiss P, Kerbl R. The relatively short duration that a child retains a pacifier in the mouth during sleep: implications for sudden infant death syndrome. *Eur J Pediatr*. 2001;160(1):60–70
 272. Foundation for the Study and Prevention of Infant Mortality (Cot Death Foundation). Safe sleeping for your baby. Available at: www.wiegedood.nl/files/download_vs_engels.pdf. Accessed September 21, 2011
 273. Foundation for the Study of Infant Deaths. Factfile 2: research background to the Reduce the Risk of Cot Death advice by the Foundation for the Study of Infant Deaths. Foundation for the Study of Infant Deaths. Available at: <http://fsid.org.uk/Document.Doc?id=42>. Accessed September 21, 2011
 274. SIDS and Kids. National Scientific Advisory Group. *Information Statement: Pacifier/Dummy Use*. Melbourne, Australia: National SIDS Council of Australia; 2009. Available at: www.sidsandkids.org/wp-content/uploads/Pacifier_Dummy_Use.pdf. Accessed September 11, 2011
 275. Aarts C, Hörnell A, Kylberg E, Hofvander Y, Gebre-Medhin M. Breastfeeding patterns in relation to thumb sucking and pacifier use. *Pediatrics*. 1999;104(4). Available at: www.pediatrics.org/cgi/content/full/104/4/e50
 276. Benis MM. Are pacifiers associated with early weaning from breastfeeding? *Adv Neonatal Care*. 2002;2(5):259–266
 277. Scott JA, Binns CW, Oddy WH, Graham KI. Predictors of breastfeeding duration: evidence from a cohort study. *Pediatrics*.

- 2006;117(4). Available at: www.pediatrics.org/cgi/content/full/117/4/e646
278. Kramer MS, Barr RG, Dagenais S, et al. Pacifier use, early weaning, and cry/fuss behavior. *JAMA*. 2001;286(3):322–326
279. Collins CT, Ryan P, Crowther CA, McPhee AJ, Paterson S, Hiller JE. Effect of bottles, cups, and dummies on breast feeding in preterm infants: a randomised controlled trial. *BMJ*. 2004;329(7459):193–198
280. Howard CR, Howard FM, Lanphear B, et al. Randomized clinical trial of pacifier use and bottle-feeding or cupfeeding and their effect on breastfeeding. *Pediatrics*. 2003; 111(3):511–518
281. O'Connor NR, Tanabe KO, Siadat MS, Hauck FR. Pacifiers and breastfeeding: a systematic review. *Arch Pediatr Adolesc Med*. 2009;163(4):378–382
282. Jenik AG, Vain NE, Gorestein AN, Jacobi NE; Pacifier and Breastfeeding Trial Group. Does the recommendation to use a pacifier influence the prevalence of breastfeeding? *J Pediatr*. 2009;155(3): 350–354.e1
283. Gartner LM, Morton J, Lawrence RA, et al; American Academy of Pediatrics, Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 2005; 115(2):496–506
284. Larsson E. The effect of dummy-sucking on the occlusion: a review. *Eur J Orthod*. 1986; 8(2):127–130
285. American Academy of Pediatric Dentistry, Council on Clinical Affairs. Policy on oral habits. Available at: www.aapd.org/media/Policies_Guidelines/P_OralHabits.pdf. Accessed April 15, 2011
286. Niemelä M, Uhari M, Möttönen M. A pacifier increases the risk of recurrent acute otitis media in children in day care centers. *Pediatrics*. 1995;96(5 pt 1):884–888
287. Niemelä M, Pihakari O, Pokka T, Uhari M. Pacifier as a risk factor for acute otitis media: a randomized, controlled trial of parental counseling. *Pediatrics*. 2000; 106(3):483–488
288. Jackson JM, Mourino AP. Pacifier use and otitis media in infants twelve months of age or younger. *Pediatr Dent*. 1999;21(4): 255–260
289. Daly KA, Giebink GS. Clinical epidemiology of otitis media. *Pediatr Infect Dis J*. 2000; 19(5 suppl):S31–S36
290. Darwazeh AM, al-Bashir A. Oral candidal flora in healthy infants. *J Oral Pathol Med*. 1995;24(8):361–364
291. North K, Fleming PJ, Golding J. Pacifier use and morbidity in the first six months of life. *Pediatrics*. 1999;103(3). Available at: www.pediatrics.org/cgi/content/full/103/3/e34
292. Niemelä M, Uhari M, Hannuksela A. Pacifiers and dental structure as risk factors for otitis media. *Int J Pediatr Otorhinolaryngol*. 1994;29(2):121–127
293. Uhari M, Mantysaari K, Niemelä M. A meta-analytic review of the risk factors for acute otitis media. *Clin Infect Dis*. 1996;22(6): 1079–1083
294. Fleming P, Gilbert R, Azaz Y, et al. Interaction between bedding and sleeping position in the sudden infant death syndrome: a population based case-control study. *BMJ*. 1990;301(6743):85–89
295. Ponsonby AL, Dwyer T, Gibbons LE, Cochrane JA, Jones ME, McCall MJ. Thermal environment and sudden infant death syndrome: case-control study. *BMJ*. 1992; 304(6822):277–282
296. McGlashan ND. Sudden infant deaths in Tasmania, 1980–1986: a seven year prospective study. *Soc Sci Med*. 1989;29(8): 1015–1026
297. Coleman-Phox K, Odouli R, Li DK. Use of a fan during sleep and the risk of sudden infant death syndrome. *Arch Pediatr Adolesc Med*. 2008;162(10):963–968
298. Chisholm JS. Swaddling, cradleboards and the development of children. *Early Hum Dev*. 1978;2(3):255–275
299. Gerard CM, Harris KA, Thach BT. Physiologic studies on swaddling: an ancient child care practice, which may promote the supine position for infant sleep. *J Pediatr*. 2002;141(3):398–403
300. van Sleuwen BE, Engelberts AC, Boere-Boonekamp MM, Kuis W, Schulpen TW, L'Hoir MP. Swaddling: a systematic review. *Pediatrics*. 2007;120(4). Available at: www.pediatrics.org/cgi/content/full/120/4/e1097
301. Richardson HL, Walker AM, Horne RS. Influence of swaddling experience on spontaneous arousal patterns and autonomic control in sleeping infants. *J Pediatr*. 2010; 157(1):85–91
302. Richardson HL, Walker AM, Horne RS. Minimizing the risks of sudden infant death syndrome: to swaddle or not to swaddle? *J Pediatr*. 2009;155(4):475–481
303. Narangerel G, Pollock J, Manaseki-Holland S, Henderson J. The effects of swaddling on oxygen saturation and respiratory rate of healthy infants in Mongolia. *Acta Paediatr*. 2007;96(2):261–265
304. Kutlu A, Memik R, Mutlu M, Kutlu R, Arslan A. Congenital dislocation of the hip and its relation to swaddling used in Turkey. *J Pediatr Orthop*. 1992;12(5):598–602
305. Chaarani MW, Al Mahmeid MS, Salman AM. Developmental dysplasia of the hip before and after increasing community awareness of the harmful effects of swaddling. *Qatar Med J*. 2002;11(1):40–43
306. Yamamuro T, Ishida K. Recent advances in the prevention, early diagnosis, and treatment of congenital dislocation of the hip in Japan. *Clin Orthop Relat Res*. 1984;(184): 34–40
307. Coleman SS. Congenital dysplasia of the hip in the Navajo infant. *Clin Orthop Relat Res*. 1968;56:179–193
308. Tronick EZ, Thomas RB, Daltabuit M. The Quechua manta pouch: a caretaking practice for buffering the Peruvian infant against the multiple stressors of high altitude. *Child Dev*. 1994;65(4):1005–1013
309. Manaseki S. Mongolia: a health system in transition. *BMJ*. 1993;307(6919):1609–1611
310. Franco P, Seret N, Van Hees JN, Scaillet S, Groswasser J, Kahn A. Influence of swaddling on sleep and arousal characteristics of healthy infants. *Pediatrics*. 2005;115(5): 1307–1311
311. Franco P, Scaillet S, Groswasser J, Kahn A. Increased cardiac autonomic responses to auditory challenges in swaddled infants. *Sleep*. 2004;27(8):1527–1532
312. Hutcheson R. DTP vaccination and sudden infant deaths: Tennessee. *MMWR Morb Mortal Wkly Rep*. 1979;28:131–132
313. Hutcheson R. Follow-up on DTP vaccination and sudden infant deaths: Tennessee. *MMWR*. 1979;28:134–135
314. Bernier RH, Frank JA Jr, Dondero TJ Jr, Turner P. Diphtheria-tetanus toxoids-pertussis vaccination and sudden infant deaths in Tennessee. *J Pediatr*. 1982; 101(3):419–421
315. Baraff LJ, Ablon WJ, Weiss RC. Possible temporal association between diphtheria-tetanus toxoid-pertussis vaccination and sudden infant death syndrome. *Pediatr Infect Dis*. 1983;2(1):7–11
316. Griffin MR, Ray WA, Livengood JR, Schaffner W. Risk of sudden infant death syndrome after immunization with the diphtheria-tetanus-pertussis vaccine. *N Engl J Med*. 1988;319(10):618–623
317. Hoffman JJ, Hunter J, Damus K, et al. Diphtheria-tetanus-pertussis immunization and sudden infant death: results of the National Institute of Child Health and Human Development Cooperative Epidemiological Study of Sudden Infant Death Syndrome Risk Factors. *Pediatrics*. 1987; 79(4):598–611
318. Taylor EM, Emergy JL. Immunization and cot deaths. *Lancet*. 1982;2(8300):721
319. Flahault A, Messiah A, Jouglu E, Bouvet E,

- Perin J, Hatton F. Sudden infant death syndrome and diphtheria/tetanus toxoid/pertussis/poliomyelitis immunisation. *Lancet*. 1988;1(8585):582–583
320. Walker AM, Jick H, Perera DR, Thompson RS, Knauss TA. Diphtheria-tetanus-pertussis immunization and sudden infant death syndrome. *Am J Public Health*. 1987; 77(8):945–951
 321. Jonville-Bera AP, Autret E, Laugier J. Sudden infant death syndrome and diphtheria-tetanus-pertussis-poliomyelitis vaccination status. *Fundam Clin Pharmacol*. 1995;9(3):263–270
 322. Immunization Safety Review Committee. In: Stratton K, Almario DA, Wizemann TM, McCormick MC, eds. *Immunization Safety Review: Vaccinations and Sudden Unexpected Death in Infancy*. Washington, DC: National Academies Press; 2003
 323. Mitchell EA, Stewart AW, Clements M, Ford RPK. Immunisation and the sudden infant death syndrome. New Zealand Cot Death Study Group. *Arch Dis Child*. 1995;73(6):498–501
 324. Jonville-Béra AP, Autret-Leca E, Barbeillon F, Paris-Llado J; French Reference Centers for SIDS. Sudden unexpected death in infants under 3 months of age and vaccination status: a case-control study. *Br J Clin Pharmacol*. 2001;51(3):271–276
 325. Fleming PJ, Blair PS, Platt MW, Tripp J, Smith IJ, Golding J. The UK accelerated immunisation programme and sudden unexpected death in infancy: case-control study. *BMJ*. 2001;322(7290):822
 326. Fine PEM, Chen RT. Confounding in studies of adverse reactions to vaccines. *Am J Epidemiol*. 1992;136(2):121–135
 327. Virtanen M, Peltola H, Paunio M, Heinonen OP. Day-to-day reactogenicity and the healthy vaccinee effect of measles-mumps-rubella vaccination. *Pediatrics*. 2000;106(5). Available at: www.pediatrics.org/cgi/content/full/106/5/e62
 328. Vennemann MM, Höffgen M, Bajanowski T, Hense HW, Mitchell EA. Do immunisations reduce the risk for SIDS? A meta-analysis. *Vaccine*. 2007;25(26):4875–4879
 329. Steinschneider A. Prolonged apnea and the sudden infant death syndrome: clinical and laboratory observations. *Pediatrics*. 1972;50(4):646–654
 330. Hodgman JE, Hoppenbrouwers T. Home monitoring for the sudden infant death syndrome: the case against. *Ann NY Acad Sci*. 1988;533:164–175
 331. Ward SL, Keens TG, Chan LS, et al. Sudden infant death syndrome in infants evaluated by apnea programs in California. *Pediatrics*. 1986;77(4):451–458
 332. Monod N, Plouin P, Sternberg B, et al. Are polygraphic and cardiopneumographic respiratory patterns useful tools for predicting the risk for sudden infant death syndrome? A 10-year study. *Biol Neonate*. 1986;50(3):147–153
 333. Ramanathan R, Corwin MJ, Hunt CE, et al. Cardiorespiratory events recorded on home monitors: comparison of healthy infants with those at increased risk for SIDS. *JAMA*. 2001;285(17):2199–2207
 334. American Academy of Pediatrics, Committee on Fetus and Newborn. Apnea, sudden infant death syndrome, and home monitoring. *Pediatrics*. 2003;111(4 pt 1):914–917
 335. Patriarca M, Lyon TD, Delves HT, Howatson AG, Fell GS. Determination of low concentrations of potentially toxic elements in human liver from newborns and infants. *Analyst*. 1999;124(9):1337–1343
 336. Kleemann WJ, Weller JP, Wolf M, Troger HD, Bluthgen A, Heeschen W. Heavy metals, chlorinated pesticides and polychlorinated biphenyls in sudden infant death syndrome (SIDS). *Int J Legal Med*. 1991; 104(2):71–75
 337. Erickson MM, Poklis A, Gantner GE, Dickinson AW, Hillman LS. Tissue mineral levels in victims of sudden infant death syndrome I. Toxic metals: lead and cadmium. *Pediatr Res*. 1983;17(10):779–784
 338. George M, Wiklund L, Aastrup M, et al. Incidence and geographical distribution of sudden infant death syndrome in relation to content of nitrate in drinking water and groundwater levels. *Eur J Clin Invest*. 2001; 31(12):1083–1094
 339. Richardson BA. Sudden infant death syndrome: a possible primary cause. *J Forensic Sci Soc*. 1994;34(3):199–204
 340. Sprott TJ. Cot death: cause and prevention—experiences in New Zealand 1995–2004. *J Nutr Environ Med*. 2004;14(3):221–232
 341. Department of Health. *Expert Group to Investigate Cot Death Theories*. London, United Kingdom: Her Majesty's Stationary Office; 1998. Available at: http://sids-network.org/experts/expert_group_to_investigate_cot_.htm. Accessed September 6, 2011
 342. Blair P, Fleming P, Bensley D, Smith I, Bacon C, Taylor E. Plastic mattresses and sudden infant death syndrome. *Lancet*. 1995;345(8951):720
 343. Rubens DD, Vohr BR, Tucker R, O'Neil C A, Chung W. Newborn oto-acoustic emission hearing screening tests: preliminary evidence for a marker of susceptibility to SIDS. *Early Hum Dev*. 2008;84(4):225–229
 344. Hamill T, Lim G. Otoacoustic emissions does not currently have ability to detect SIDS. *Early Hum Dev*. 2008;84(6):373
 345. Krous HF, Byard RW. Newborn hearing screens and SIDS. *Early Hum Dev*. 2008; 84(6):371
 346. Farquhar LJ, Jennings P. Newborn hearing screen results for infants that died of SIDS in Michigan 2004–2006. *Early Hum Dev*. 2008;84(10):699
 347. Hauck FR, Tanabe KO. SIDS. *Clin Evid (Online)*. 2009; pii: 0315
 348. Moon RY, Oden RP, Grady KC. Back to Sleep: educational intervention with Women, Infants, and Children program clients. *Pediatrics*. 2004;113(3 pt 1):542–547
 349. Colson ER, Joslin SC. Changing nursery practice gets inner-city infants in the supine position for sleep. *Arch Pediatr Adolesc Med*. 2002;156(7):717–720
 350. Moon RY, Calabrese T, Aird L. Reducing the risk of sudden infant death syndrome in child care and changing provider practices: lessons learned from a demonstration project. *Pediatrics*. 2008;122(4): 788–798
 351. Moon RY, Oden RP. Back to sleep: can we influence child care providers? *Pediatrics*. 2003;112(4):878–882
 352. Lerner H, McClain M, Vance JC. SIDS education in nursing and medical schools in the United States. *J Nurs Educ*. 2002;41(8): 353–356
 353. Price SK, Gardner P, Hillman L, Schenk K, Warren C. Changing hospital newborn nursery practice: results from a statewide “Back to Sleep” nurses training program. *Matern Child Health J*. 2008;12(3):363–371
 354. Joyner BL, Gill-Bailey C, Moon RY. Infant sleep environments depicted in magazines targeted to women of childbearing age. *Pediatrics*. 2009;124(3). Available at: www.pediatrics.org/cgi/content/full/124/3/e416
 355. Yanovitzky I, Blitz CL. Effect of media coverage and physician advice on utilization of breast cancer screening by women 40 years and older. *J Health Commun*. 2000; 5(2):117–134
 356. Marketing Evolution. *Measuring Media Effectiveness: Comparing Media Contribution Throughout the Purchase Funnel*. New York, NY: Magazine Publishers of America; 2006. Available at: www.magazine.org/content/Files/MEFullStudy2006.pdf. Accessed September 6, 2011

PARTICIPATING HOSPITALS

CRISP REGIONAL HOSPITAL
DEKALB MEDICAL CENTER AT NORTH DECATUR
DOCTORS HOSPITAL OF AUGUSTA - NICU
DORMINY MEDICAL CENTER
HOUSTON MEDICAL CENTER
JOHN D. ARCHBOLD MEMORIAL HOSPITAL
MEMORIAL UNIVERSITY MEDICAL CENTER, CHILDRENS HOSPITAL
NORTH FULTON REGIONAL HOSPITAL
NORTHSIDE HOSPITAL FORSYTH
PHOEBE PUTNEY MEMORIAL HOSPITAL

PHOEBE SUMTER MEDICAL CENTER
PIEDMONT NEWTON MEDICAL CENTER
TANNER MEDICAL CENTER - CARROLLTON
TANNER MEDICAL CENTER VILLA RICA
TAYLOR REGIONAL HOSPITAL
UPSON REGIONAL MEDICAL CENTER
WAYNE MEMORIAL HOSPITAL
WELLSTAR COBB HOSPITAL
WELLSTAR KENNESTONE HOSPITAL



PLEASE TURN ME OVER

GEORGIA SAFE TO SLEEP CAMPAIGN
dph.ga.gov/safetosleep



FOR ADDITIONAL TOOLS AND RESOURCES, OR IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE
DPH SAFE TO SLEEP CAMPAIGN COORDINATOR AT 404-657-2921 OR INJURY.PREVENTION@DPH.GA.GOV