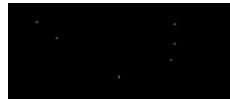


# **Role of the Health Care Provider in Reducing Infant Deaths**

**Metropolitan Chicago Healthcare Council  
&  
SIDS Alliance of Illinois  
September, 2002**



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# The Importance of Health Care Providers in Reducing Infant Deaths due to SIDS

- **YOU** are viewed as the experts
- Parents will copy behaviors they see in the hospital

Willinger, 1991

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# What Is SIDS?

***Sudden Infant Death Syndrome (SIDS)*** is the sudden death of an infant under the age of one year that remains unexplained after:

- A complete autopsy
- Review of the case history
- Death scene investigation (NICHD, Willinger et al, 1991)
- SIDS is a terminal event and is a diagnosis of exclusion

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- A complete autopsy is mandatory in the state of Illinois for any child under the age of 2 who dies with no previous medical history.
- During the review of case history, the investigators examine the infant's & mother's medical records including pre and postnatal visits and labor and delivery records.
- The death scene investigation is critical because at the time of autopsy, the pathologist cannot tell the difference between SIDS and accidental suffocation.
- SIDS is a diagnosis of exclusion. Therefore, this diagnosis is only used when the autopsy, review of case history, and death scene investigation are all negative.
- "Terminal event" means there is no such thing as "near SIDS", "missed SIDS", or "aborted SIDS" - If an infant remains alive, he or she cannot have Sudden Infant **DEATH** Syndrome.

## How Many Babies Die From SIDS Each Year in the U.S.?

- About 3,000 babies die each year
- ONE baby dies every THREE hours
- SIDS is the #1 cause of post-neonatal death  
(American Academy of Pediatrics, 2000)

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- Preliminary Numbers for 2000 indicate 2,151 babies died from SIDS.

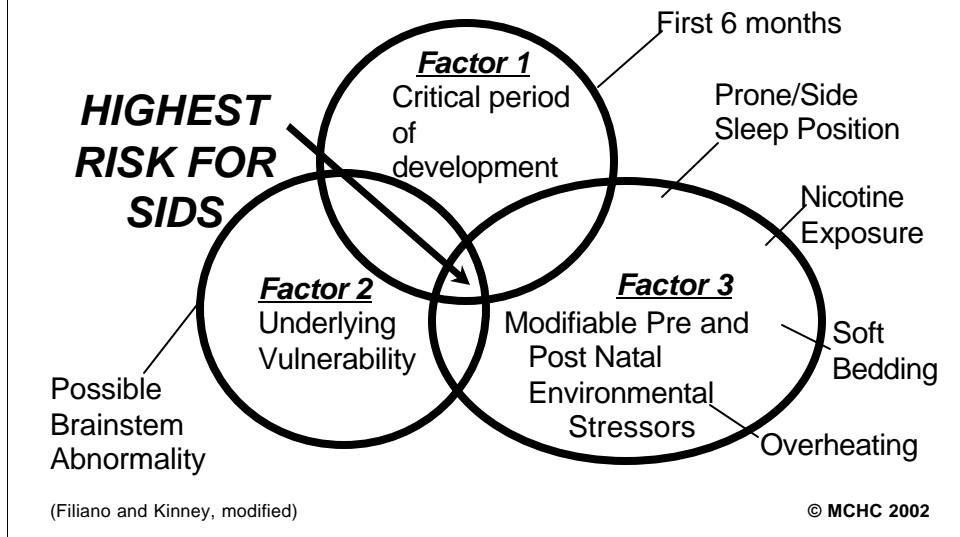
## Facts About SIDS

- There are no fool-proof ways to predict which babies will die from SIDS
- SIDS occurs in all socio-economic, racial and ethnic groups
- Approximately 95% of SIDS deaths occur before 6 months of age, with the peak incidence at 2-4 months (Culbertson, 1988)

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- SIDS is not:
  - Caused by vaccines,
  - Caused by child abuse, or
  - Contagious
- **THERE IS NO CAUSAL RELATIONSHIP BETWEEN VACCINES AND SIDS**; there is merely a temporal relationship between SIDS and vaccines which means babies begin vaccinations during the peak risk period for SIDS (2-4 months).
- An unimmunized infant is more likely to die from pertussis than an immunized infant is to die from SIDS.
- Immunizations should be encouraged as per the Center for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP) and the Advisory Committee on Immunization Practices (ACIP) recommendations.
- **DATA SUGGEST THAT IMMUNIZATIONS MAY HAVE A PROTECTIVE EFFECT AGAINST SIDS** (Fleming, 2000). Babies who are immunized are as a whole, healthier, and it is well-known that healthy babies have a lower risk for SIDS.

# Triple Risk Model to Explain SIDS



- No one knows yet why SIDS happens, but researchers believe that SIDS may be explained by this model.
- However, there are babies who die of SIDS who have no risk factors, and infants who live that have a number of SIDS risk factors. Risk factors are not necessarily the causal agent.
- **FACTOR 1:** The critical development period refers to the first 6 months (specifically, the 2-4 month age range) in which there is dramatic development of and change in the infant's brain and homeostatic systems. This is a high risk period for infants, with the majority of SIDS deaths occurring near this time.
- **FACTOR 2:** The underlying vulnerability refers to a possible abnormality in the brainstem (in a region called the medullary arcuate nucleus). This region regulates autonomic and respiratory control during sleep. If this region is abnormal, an infant may be at increased risk for SIDS (Filiano, 1994).
- **FACTOR 3:** The modifiable stressors – prone/side sleep position, nicotine exposure and overheating are under our control to change.

## Who are the Babies at Greatest Risk of SIDS Due To Underlying Vulnerability?

- Preterm babies, particularly <1000 grams (2.2 pounds)
- Those with Intrauterine Growth Restriction
- Males
- African Americans and Native Americans
- Those born to mothers with little or no prenatal care
- Those born to mothers under age 20 (Hoffman & Hillman, 1992)

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- Intrauterine growth restriction ("IUGR," for short) is a term for a baby who is smaller than normal during pregnancy. The baby is not growing inside the uterus at the normal rate. These babies usually have a low weight at birth.
- Nationally, African American babies have 2x higher risk than Caucasians. In 2001 in Illinois, the disparity is higher, with African Americans having a 6-fold higher risk for SIDS. In Chicago, for every Caucasian baby that dies, 9 African-American babies die of SIDS.
- Babies may appear healthy but may have an upper respiratory infection (URI), or diarrheal illness prior to death.

# What Can We Do As Health Care Providers to Avoid Modifiable Stressors?

**We can** educate parents and caregivers that:

- Babies should always be placed on their backs for sleeping
- Babies should never be exposed to any type of smoke
- Babies should sleep on a firm, flat surface with no soft bedding present
- Babies should not be overheated

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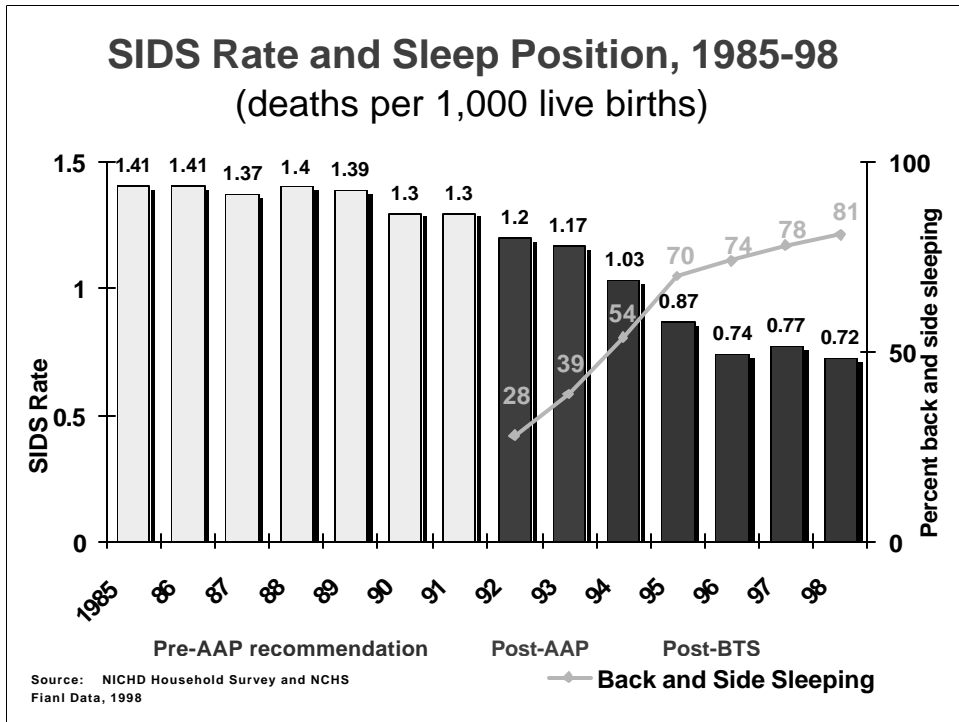
# Sleep Position

## The Evolution of *Back-to-Sleep*...

- 1989 - New Zealand pediatrician found over 70% of infants who died unexpectedly were found in the prone position
- 1992 - American Academy of Pediatrics (AAP) recommended side or back sleeping for all infants
- 1996 - AAP recommends back sleeping but states side is better than prone (tummy)
- 2000 - AAP releases position statement advocating back sleeping

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- Babies sleep differently on their backs than they do on their stomachs; infants have shorter sleep cycles, have more rapid-eye-movement sleep and have more arousals on their backs than in the prone position. Babies on their tummy may have a decreased ability to wake up or respond to a life-threatening situation. (Horne, 2001)  
Examples of life-threatening situations include:
  - hypoxia (decreased oxygen)
  - bradycardia (slow heart rate)
  - excessive overheating or
  - the nose and mouth obstructed by soft bedding - (such as pillows, quilts, comforters, bumper pads and sheepskins, stuffed animals) or placed on a waterbed or couch.
- Infants who sleep on their back are 3 times less likely to die from SIDS than those who sleep on their stomach. (Fleming, 1990)



- In 1991, a study by Beal and Finch showed that prone positioning carries a higher risk for SIDS.
- In 1992, a national campaign to increase Back to Sleep was initiated.
- As demonstrated in the graph, there is a direct correlation between the increased number of babies sleeping on their backs and decreased number of deaths due to SIDS.

# Sleep Position

- ***Back sleeping is a learned behavior.*** For parents struggling with getting their infants to sleep on their backs, encourage them not to give up. The children will learn to sleep on their backs!



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- **STRESS THAT BACK SLEEPING IS A LEARNED BEHAVIOR!**

# Sleep Position

- Infants who are unaccustomed to prone sleeping have an *18-fold increased risk* for SIDS when they are placed prone or roll to the prone position during sleep (Mitchell, 1999)
- Side sleeping poses a big risk because the position is unstable, and the infant may roll to the tummy position

***THEREFORE...***

**EDUCATE ALL CARETAKERS ON THE IMPORTANCE OF BACK SLEEPING**

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- A study by Moon et al (2000) illustrated the following about sudden infant death and child care:
  - Approximately 20% of all SIDS cases occur in child care. One-third of these occur during the first week of child care.
  - Of the cases that occurred in child care, 60% were in family child care homes.

# Sleep Position

## Additional Advantages of Back Sleeping...

Studies have shown that babies who sleep on their back:

- Swallow more often
- Have fewer ear infections at 3 & 6 months
- Experience less stuffy noses at 6 months

(Hunt, 2000)

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- Babies who sleep on their backs have a heightened swallow reflex which helps keep their airway clear as well as clears their eustachian tubes.
- **THIS IS AN IMPORTANT SLIDE!**
- **THE MATERIAL IN THIS SLIDE NEEDS BE HIGHLIGHTED DURING THE PRESENTATION.**

# Sleep Position

## About Aspiration...

- Babies are not at a greater risk for aspiration or vomiting on their backs
- There is **no** evidence of an increase in aspiration or vomiting since back sleeping was recommended
- There is evidence that infants who vomit are at **greater risk** of choking if they are **sleeping face down**

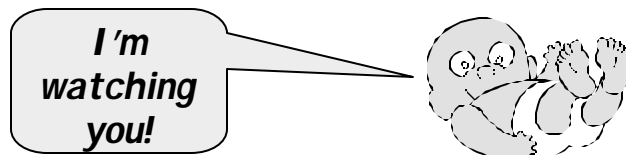
(AAP, 2000)

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- Infants have what are called laryngeal chemoreflexes (LCR) – apnea, swallowing, laryngeal closure, cough, and arousal from sleep. They remove fluids and prevent aspiration. These reflexes are competent in the supine (back) position.
- Airway protection may actually be compromised in the prone position. In the prone position, the trachea sits on top of the esophagus. Anything regurgitated in the prone position will pool in the larynx and drain into the trachea, leading to aspiration. *(Consider demonstrating this with a doll.)*
- Acknowledge past behavior and outdated concern that babies are at risk of aspiration. *(Remind staff that even text books are already 3 years old by the time they are printed.)*

The current standard of care is *Back to Sleep* and the nurses are responsible for providing this standard of care

IF THE STANDARD OF CARE IS NOT PRACTICED, THERE ARE LEGAL IMPLICATIONS



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- Although some literature may continue to advocate side lying as an acceptable position for sleep, the data show that back to sleep is the standard of care and the only position that should be recommended.

# Sleep Position

## Positional Head Molding...

- Parents concerned about head asymmetries in babies who sleep on their backs should be assured that:
  - Babies only need to be on their backs for nap-time and night-time sleep
  - Babies should have **SUPERVISED** tummy time when awake
  - Head asymmetry typically resolves itself by 6 to 12 months

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- The term for a “flat head” is plagiocephaly.
- Because babies turn their head toward the sound of someone approaching them, alternate ends of the crib as the “head” at least weekly. For example, put the baby’s head at the “head” of the crib today, and put the baby’s head at the “foot” of the crib next week.
- Parents should be encouraged to reposition the baby frequently. The amount of time the baby is flat on his or her back **while awake** should be limited. This includes time spent in the car seat carrier (when not traveling), swing, bouncer, stroller or high chair.
- Supervised tummy time not only reduces positional head molding but also improves muscle development in the upper limbs and shoulders.
- Babies who are placed on their backs typically have a little bald spot on the back of the head...this is **NORMAL** and expected for babies who sleep on their backs.

# Sleep Position

## When Babies Roll to their Tummies...

- At about 5 months of age, many babies begin to roll from their backs to their tummies
- This is normal growth and development
- Parents should be taught to always place babies on their backs to sleep, but if they roll to their tummies they do not need to keep flipping them back....
- The **MOST IMPORTANT** point to remember is when they roll, they do so in a safe sleep environment - free from soft bedding, pillows, stuffed toys and other objects

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# Sleep Position

## Developmental Issues...

- Back sleeping may result in a slight delay for certain motor milestones, such as crawling
- HOWEVER, these infants are still within **normal** range
- Back sleeping infants catch up by 12 months, and there are **no** long-term developmental effects
- Motor milestones may be improved by more tummy time while awake (Davis, 1998)

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- Pediatricians consider language skills (as opposed to motor milestones) to be a better indicator of overall development.

# Sleep Position

## Pre - Back to Sleep   Post - Back to Sleep

- Study of 201 SIDS infants showed that:
  - 93% were found in the prone (tummy) position (Fleming, 2000)
- Study of 321 SIDS infants showed that:
  - 11.5% were found in the prone (tummy) position (Fleming, 2000)

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- A newer study (1998) by L'Hoir and colleagues showed that even in the Netherlands where the SIDS rate is very low and 93% of parents put their babies on the back to sleep, tummy sleeping still increases the risk of SIDS by more than 7-fold.

# Cigarette Smoke Exposure

- Maternal cigarette smoking **during** and **after** pregnancy results in a higher risk of SIDS (Fleming, 2000)
- Exposure to second hand smoke **during** and **after** pregnancy also increases the risk in a dose-dependent manner (Blair)

***THEREFORE...***

**ADVISE PARENTS THAT NO ONE SHOULD  
SMOKE AROUND THE PREGNANT  
MOTHER OR THE BABY**



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- Prenatal nicotine exposure negatively affects development of the fetal brain and may alter pathways that control homeostasis. This would increase susceptibility to SIDS (Slotkin, 1998).

# Soft Bedding

What is "***Soft Bedding***"?

- In the crib, soft bedding includes pillows, quilts, comforters, bumper pads, sheepskins and stuffed toys
- Adult beds/mattresses, waterbeds and couches are also soft bedding, as are pillows, quilts, blankets, etc. found in the adult sleep area

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# Soft Bedding

- Soft bedding may **trap exhaled air** (Kemp and Thach, 1995)
- Baby sleep products (such as wedges, bolsters, positioning devices) have not been proven to reduce the risk of SIDS and are not recommended

**THEREFORE...**

**BABIES SHOULD SLEEP ON A FIRM  
FLAT SURFACE WITH NO SOFT  
BEDDING**

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- Approximately **900** deaths annually attributed to SIDS may be caused by soft bedding (CPSC, 2000).
- When soft bedding material traps exhaled air, the infant may rebreathe their exhaled carbon dioxide instead of breathing oxygen-rich fresh air.
- Generally, as the carbon dioxide level goes up and the oxygen level goes down, a normal response would be to take a deep breath to normalize carbon dioxide and oxygen levels. In vulnerable infants, this may not occur.
- In 30% of 119 SIDS deaths, the infant's nose and mouth were covered in soft bedding (Kemp and Thatch, 1995).
- A baby's face should not be covered with anything! This includes blankets, car seat covers and plastic stroller coverings.

# Overheating

- Overheating may predispose an infant to increased core body temperature, which may cause decreased arousal during sleep
- Babies who sleep on their backs are less likely to overheat

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- 94% of 34 SIDS victims were discovered hot and sweaty in a warm environment (Stanton, 1989).
- Excessive wrapping accompanied by illness or fever can increase the infant's risk of dying of SIDS (Nelson, 1989).

# Overheating

- Avoid over-bundling
- The infant should not feel hot to the touch
- Keeping the **face and head uncovered** is important in maintaining proper core body temperature because the head is the main source of heat loss in infants (Nelson, 1989)

**THEREFORE...**

**BABIES SHOULD NOT BE OVERHEATED**

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- If infants are swaddled, the infant's head should not be covered with a blanket.
- Overheating does not always relate to the sleep environment. It is important not to over-bundle infants while in a car seat. If babies are bundled up when going outside, it is important to **UN-BUNDLE** them once they are brought inside...even if it is for a short time.
- Consider using a sleep sack. They may contribute to the low incidence of SIDS in the Netherlands where they are used widely -- about 75% of the time.

## **Use of sleep sacks...**

- Leads to placing infants on back to sleep (because the zipper is in front).
- Prevents infants from rolling to their tummies too early.
- Requires less bedding which: 1) prevents hyperthermia and 2) reduces the bedding that is necessary, thus preventing infants from ending up under the bedding.

# Creating a Safe Sleep Environment

The Components of a Safe Sleep Environment Are:

- The **CRIB**
- The firm **MATTRESS**
- The tightly fitted **SHEET**
- *And...*
- The **BABY**



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- Emphasis should be on only these four items to create a safe sleep environment - nothing more.
- Nursing staff can recommend that quilts can be used as a decoration, such as hanging on the wall.
- The standard distance between slats in a safe crib is  $2\frac{3}{8}$  inches – if you are able to pass a can of soda between the slats, the crib is unsafe.
- ***REMEMBER - THERE SHOULD BE NO STUFFED ANIMALS OR TOYS IN THE CRIB OR BASSINET...EVEN IF THEY ARE CUDDLY AND CUTE!***

# Creating a Safe Sleep Environment

- Place the baby on his or her ***back to sleep***
- ***Use a firm, flat surface for sleeping***
- ***Eliminate soft bedding*** and blankets from cribs
  - Consider using a blanket sleeper or a sleep sack as an alternative to blankets
  - If using a blanket, use a thin one and tuck it around the mattress so it reaches only as far as the baby's chest
  - Remove bumper pads from cribs
  - Do not allow stuffed animals or pillows in the crib
- ***Avoid over-bundling.*** The infant should not feel hot to the touch - keep the room temperature between 61-68°F

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# Bed Sharing

- Bed sharing is unsafe because of the risk of suffocation due to accidental entrapment of an infant under a sleeping adult or child (overlying) (ASIP, 2001)
- It only takes minutes to suffocate an infant!
- Place the crib or bassinet next to or near the adult bed to aid with breastfeeding and bonding, but ***DO NOT BED SHARE!***

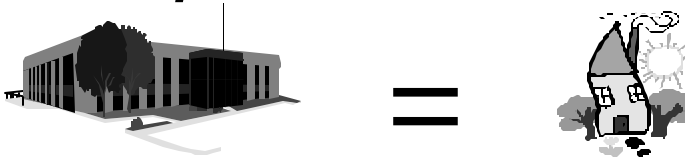
**BED SHARING IS NOT PROTECTIVE  
AGAINST SIDS!**

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- Encourage room sharing with baby and not sleeping in the same bed.
- Room sharing has been shown to reduce the risk of SIDS (Fleming, 2000).
- If a mother **ABSOLUTELY INSISTS** on bed sharing:
  - 1 - the area should be free of pillows, large blankets, etc.
  - 2 - There should be NO space between the mattress and the headboard or frame (to prevent entrapment).
  - 3 - Bed sharing should be restricted to mother and baby only.
- **EMPHASIZE THAT BONDING TAKES PLACE DURING WAKEFULNESS, NOT DURING SLEEP.**

# **YOU CAN MAKE A DIFFERENCE!**

***The Information Provided  
and Behaviors YOU Model in  
the Hospital  
will Impact Behaviors at Home***



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The references cited in this presentation are available.

***(Consider distributing the references to accompany the presentation.)***

***Special thanks to the SIDS Task Force of the Committee on Clinical, Administrative, Professional and Emergency Services and the leadership of its chairs, Jean Silvestri, MD and Debra Weese-Mayer, MD from Rush Children's Hospital in Chicago.***



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