Cribs for Kids®
National Infant Safe Sleep Initiative

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The ABCs of Infant Safe Sleep
What Every Caregiver Should Know

Alone,
on the Back,
in a Crib!
What is SUID or SUDI?

- Sudden Unexpected Infant Death
- The big “umbrella” of all unexplained infant deaths
- SIDS represents a subcategory of SUID
Some causes of deaths that occur suddenly and unexpectedly during infancy:

- SIDS
- Accidental suffocation
- Hypothermia/Hyperthermia
- Metabolic disorders
- Poisoning
- Unknown
- Neglect or homicide
- Unknown
Sudden Infant Death Syndrome

ICD-10 R95 Definition

The sudden death of an infant under one year of age which remains unexplained after the performance of a complete post-mortem investigation including:

• Autopsy
• Examination of the scene of death
• Review of the case history
SIDS Facts

- Leading cause of infant death between 1 month and 1 year of age
- Highest rates in African American/American Indian/Alaska Native babies
- 2,500 babies die of SIDS each year in U.S.
- Peak incidence between 2 – 4 months of age
- More males than females (60% to 40% ratio)
- Baby apparently healthy, often recent URI (50%)
Risk Factors

- Mothers who smoke during pregnancy (3x greater risk)
- Babies who breathe secondhand smoke (2.5x greater risk)
- Babies who sleep on their tummies (5x greater risk)
- Unaccustomed tummy sleeping (18-20x greater risk)
- Babies who sleep with parent(s) in adult bed (40x greater risk)
- Late or no prenatal care
- Young maternal age
- Prenatal exposure to illicit drug or alcohol use
- Overheating the baby during sleep
- Soft sleep surface
- Prematurity and/or low birth weight

Fact: Prone sleep position rate is increasing in AA babies = higher number of deaths.
Sleep-Related Deaths
in Child Care

- Two thirds of US infants younger than 1 year are in nonparental child care.

- 32% of infants are in child care full time.

- Less than 9% of SIDS deaths should occur in child care.

--Ehrle et al, 2001
Sleep-Related Deaths in Child Care

• 20.4% of deaths occurred in regulated child care (1995–1997).
  – 60% in family child care
  – 20% in child care centers
  – 20% in relative care

• Infants tended to be white with older, more educated parents.
  – Moon et al, 2000
Sleep-Related Deaths in Child Care

- Approximately $\frac{1}{3}$ of sleep-related deaths in child care occur in the first week, $\frac{1}{2}$ of these on the first day.
- Something intrinsic to child care? No

- Unaccustomed tummy sleeping? Yes
- Unsafe sleeping environments? Yes
Unaccustomed Tummy Sleeping

• Increased risk of death (20 times!).
• Non-parental caregivers may use tummy sleeping.
• Less ability to lift head in tummy position.
• Later development of upper body strength.

--Mitchell et al, 1999
Why Tummy Sleeping May Lead To Death...

1. Increases the probability of the baby re-breathing his/own expired breath, leading to carbon dioxide buildup and low oxygen levels.
2. Causes upper airway obstruction.
3. Interferes with body heat dissipation, leading to overheating.
4. Baby is less reactive to noise.
5. Baby experiences sudden decrease in blood pressure and heart rate control.
6. Baby experiences less movement, higher arousal thresholds, and longer periods of sleep.

*Greater possibility that the baby will ‘sleep himself or herself…to death’.*
Re-breathing Theory

- Infants in certain sleep environments are more likely to trap exhaled carbon dioxide around the face
  - Lie prone and near-face-down/ face-down
  - Soft bedding
  - Tobacco smoke exposure
- Infants rebreathe exhaled carbon dioxide
- Infants die if they cannot arouse/ respond appropriately
Triple Risk Model for SIDS

- Critical Developmental Period
- Underlying Vulnerability
- Exogenous Stressors

Kinney, NEJM, 2009
Moon, Pediatrics, 2011
Triple Risk Model

• Critical Developmental Period
  • First 6 months
  • Major physiologic changes in homeostatic controls

Kinney, NEJM, 2009
Triple Risk Model

Underlying Vulnerability

Brainstem abnormality

- Serotonin (5-HT)
- Impaired arousal
- Affected by
  - prenatal and post-natal smoke exposure
  - (2nd and 3rd hand)
- prematurity

Serotonin receptor binding density lower in SIDS cases compared to controls.
Triple Risk Model

Exogenous Stressors

- Prone and side sleep position
- Loose and soft bedding
- Cluttered sleep environment
- Bed-sharing
- Sleeping with baby on couch
- Overheating
- Tobacco smoke exposure

Modifiable

Critical Period of Development

- 90% of SIDS cases prior to 6 months
- Rapid brain growth
- Developmental changes in sleep state organization, arousal, cardiorespiratory control, and metabolism
- Individual differences in the normal physiologic maturation of the brain and brainstem
- Individual variations in development of muscle tone and head control
Figure 1. Five Steps in the Putative Terminal Respiratory Pathway Associated with the Sudden Infant Death Syndrome.

Death results from one or more failures in protective mechanisms against a life-threatening event during sleep in the vulnerable infant during a critical period. Complex genetic and environmental interactions influence the pathway.
National SIDS Rate and Sleep Position, 1988-2008

NICHD Household Survey, SIDS Rate
Source: National Center for Health Statistics, CDC
Before Back to Sleep              After Back to Sleep

8,000 babies died annually        2,500 babies die annually

45,000+ babies’ lives have been saved by placing them on their backs to sleep!
AAP Updated Recommendations
October 10, 2005

Key Points

• “Every caregiver should use the back sleep position during every sleep period.”

• “Bed-sharing during sleep is not recommended.”

• “A separate but proximate sleeping environment is recommended.”

• “Consider using a pacifier at nap time and bed time.”
  - At about 1 month of age, after breastfeeding is firmly established.
  - Decreases risk of death by 90
Pacifiers: Last/Referent Sleep and SIDS Risk (Hauck 2005)

A. Univariate Analyses

<table>
<thead>
<tr>
<th>Source</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenter et al 2004</td>
<td>0.47 (0.34-0.64)</td>
</tr>
<tr>
<td>Fleming et al 1999</td>
<td>0.62 (0.46-0.83)</td>
</tr>
<tr>
<td>Hauck et al 2003</td>
<td>0.33 (0.21-0.54)</td>
</tr>
<tr>
<td>L’Hoir et al 1999</td>
<td>0.16 (0.07-0.36)</td>
</tr>
<tr>
<td>McGarvey et al 2004</td>
<td>0.34 (0.22-0.50)</td>
</tr>
<tr>
<td>Mitchell et al 1993</td>
<td>0.44 (0.26-0.73)</td>
</tr>
<tr>
<td>Tappin et al 2002*</td>
<td>0.55 (0.32-0.95)</td>
</tr>
<tr>
<td>Tappin et al 2002†</td>
<td>0.91 (0.47-1.76)</td>
</tr>
</tbody>
</table>

Summary Odds Ratio: 0.47 (0.40-0.55)

Test for homogeneity P = 0.010
Test for overall effect P < 0.001

B. Multivariate Analyses

<table>
<thead>
<tr>
<th>Source</th>
<th>Odds Ratio</th>
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<tbody>
<tr>
<td>Carpenter et al 2004</td>
<td>0.44 (0.29-0.68)</td>
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<tr>
<td>Fleming et al 1999</td>
<td>0.41 (0.22-0.77)</td>
</tr>
<tr>
<td>Hauck et al 2003</td>
<td>0.34 (0.17-0.71)</td>
</tr>
<tr>
<td>L’Hoir et al 1999</td>
<td>0.05 (0.01-0.29)</td>
</tr>
<tr>
<td>McGarvey et al 2004</td>
<td>0.10 (0.03-0.31)</td>
</tr>
<tr>
<td>Mitchell et al 1993</td>
<td>0.43 (0.24-0.76)</td>
</tr>
<tr>
<td>Tappin et al 2002*</td>
<td>0.59 (0.30-1.17)</td>
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</table>

Summary Odds Ratio: 0.39 (0.31-0.50)

Test for homogeneity P = 0.040
Test for overall effect P < 0.001

* "A little" pacifier use
† "A lot" pacifier use
Pacifiers and Breastfeeding

- Well-designed trials:
  - 2 found no association among term infants
  - 1 found no association among preterm infants
  - 1 found slightly decreased breastfeeding duration at one month if pacifier introduced in first week of life,

but NO difference if pacifier introduced after one month!
Recommendations: Pacifier Use

- Consider using a pacifier at bedtime and nap time during the first year of life
  - If breastfeeding, delay pacifier - 3 to 4 weeks of age
  - Use when baby is falling asleep
  - Do NOT reinsert after baby is asleep
  - Do NOT coat in any sweet solution
  - Clean pacifiers and replace regularly

+ = HEALTHY & SAFE
AAP Updated Recommendations
October 17, 2011

Key Points

- “Breastfeeding is associated with a reduced risk of SIDS.”
- “Infant immunization reduces risk of SIDS by 50%”
- “Bumper pads should not be used.”
- “Room-sharing without Bed-sharing is recommended.”
Bumper Pad Fatalities

- Thach study using CPSC data found 3 mechanisms for deaths
  - Suffocation
  - Entrapment
  - Strangulation
Breastfeeding and Reduced Risk of SIDS: A Meta-analysis

Hauck, Thompson, Tanabe, Moon, Vennemann
Pediatrics, online June 13, 2011

- Breastfeeding reduces risk for SIDS by 45%
- Exclusive breastfeeding at one month halved the risk of SIDS.
- Protective effect increased with exclusivity.
- More easily aroused.
- Decreased incidence of infectious diseases.
- Overall immune system benefits.
Recommendation: Breastfeeding is Protective Against SIDS!!

- Agency for Healthcare Research and Quality meta-analysis (adjusted summary OR, 0.64; 95% CI, 0.51-0.81)
- German SIDS Study Group (50% protective effect)
- Hauck, Vennemann, and Moon meta-analysis (18 case control studies): Adjusted OR = 0.55

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>log[]</th>
<th>SE</th>
<th>Weight</th>
<th>IV, Fixed, 95% CI</th>
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<tbody>
<tr>
<td>Fleming 1996</td>
<td>0.058269</td>
<td>0.317657</td>
<td>12.6%</td>
<td>1.06 [0.57, 1.98]</td>
</tr>
<tr>
<td>Hauck 2003</td>
<td>-0.91629</td>
<td>0.319582</td>
<td>12.4%</td>
<td>0.40 [0.21, 0.75]</td>
</tr>
<tr>
<td>Klonoff-Cohen 1995</td>
<td>-0.89159812</td>
<td>0.3346305</td>
<td>11.4%</td>
<td>0.41 [0.21, 0.79]</td>
</tr>
<tr>
<td>Mitchell 1997</td>
<td>-0.07257</td>
<td>0.420337</td>
<td>7.2%</td>
<td>0.93 [0.41, 2.12]</td>
</tr>
<tr>
<td>Ponsonby 1995</td>
<td>-0.15082</td>
<td>0.401245</td>
<td>7.9%</td>
<td>0.86 [0.39, 1.89]</td>
</tr>
<tr>
<td>Vennemann 2009</td>
<td>-0.84397</td>
<td>0.239354</td>
<td>22.2%</td>
<td>0.43 [0.27, 0.69]</td>
</tr>
<tr>
<td>Wennergren 1997</td>
<td>-0.693147</td>
<td>0.21979</td>
<td>26.3%</td>
<td>0.50 [0.33, 0.77]</td>
</tr>
</tbody>
</table>

Total (95% CI) 100.0% 0.55 [0.44, 0.69]

Heterogeneity: Chi² = 10.08, df = 6 (P = 0.12); I² = 40%
Test for overall effect: Z = 5.28 (P < 0.00001)
Lunch Break...

DON'T KNOW WHERE I'LL GO FOR LUNCH

LEFT OR RIGHT?
Relationship of Immunizations to SIDS

Meta-analysis of studies controlling for co-variables:
The risk of SIDS is halved by immunization!

Recommendation: Infants should be immunized in accordance with AAP and CDC recommendations.
Do not use pacifier attachments
Be Aware…Amber Teething Necklaces - NOT Safe!

These are NOT meant to be chewed upon or mouthed, and parents may not be aware of this. Poses a strangulation risk, and if mouthed, can break into small pieces and be a choking hazard.
AAP Updated Recommendations
October 17, 2011

Key Points

• “Breastfeeding is recommended and is associated with a reduced risk of SIDS.”

• “Infant immunization reduces risk of SIDS by 50%”

• “Bumper pads should not be used.”

• “Room-sharing without bed-sharing is recommended.”
We Need to Move Beyond Back to Sleep

She’s on her back to sleep!
Where Should Infants Sleep?
Sheers, Rutherford, and Kemp
Pediatrics, Oct. 2003

- Infants < 8 months, risk of death in cribs: .63 deaths/100,000 infants.
- Infants < 8 months, risk of death in adult beds: 25.5 deaths per 100,000 infants.

Risk for SIDS:
**Greatest** if sharing a sleep surface.
**Intermediate** if sleeping in another room.
**Least** if infant sleeps in same room without bed-sharing.
What Can We Do About It??

TALK ABOUT SAFE SLEEP!

To everyone:

- Family members
- Friends
- Neighbors
- Strangers
- Produce guy in grocery store!

--Yes, even him!
Avoiding Potential Pitfalls

- Fear of aspiration
- Fear of positional head molding
- Claims made against the program:
  - Anti-bonding
  - Anti-breastfeeding
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).
The Truth About Back Sleep and Aspiration

Orientation of the Trachea (air pipe) to the Esophagus (food pipe)
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
Tummy Time!

Noah

Mason
Room-sharing!

- Baby in a separate, safe sleeping space.
- Close to parent(s)
- Bring baby into bed for breastfeeding or comforting, but when the mother is ready to fall back to sleep, place baby in his/her safe sleep environment.
About Bonding...

How and When do we Bond with our Baby???
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
Sitting Devices for Sleep

- Car safety seats, strollers, swings, infant carriers, infant slings
- Not recommended for routine sleep in the hospital or at home
- Infants < 4 months are particularly at risk
  - More likely to assume positions that can create risk of suffocation or airway obstruction
- Infant slings and cloth carriers:
  - 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
  - Reposition baby after nursing
- If an infant falls asleep, move infant 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
Bed-Sharing and Infant Death

- **FACT:** Half of the infants in the U.S. who die from sudden unexpected death do so while sleeping with their parents.
  - Bed-sharing and infant death is very different in the U.S. than it is in other cultures.
  - If babies routinely sleep with their parents in other cultures, they:
    - Use a firm mat on the floor
    - Have a separate mat for the infant
    - Do not use soft bedding
Bed-Sharing
Bed-Sharing
Bed-Sharing with Overlay
Bed-Sharing with Overlay
Safe Sleep Video: “Rethink Your Position”

- www.youtube.com/watch?v=UeZU
  Aumo-KQ&feature=youtu.be

- Or Go to “You Tube” and search “Safe Sleep Video - Rethink Your Position”
Couch Sleeping
Couch Sleeping
Unsafe Sleep Environment:
Falls from Adult Beds onto Soft Materials
Unsafe Sleep Environment: Defective Crib/Entrapment
What is wrong with this picture?
Social Environmental Change is Essential, BUT Social Norms are Against Us
“Oops she did it again”

• Who is she and what did she do?

• Brittany Spears places her infant son in a high risk situation
Changing Societal Norms

• The public outcry indicated public awareness of the risks to infants in cars
• The public is educated to the need to use an infant safety seat
• This event provided a major prevention opportunity
What did Jennifer Lopez & Marc Anthony do?

- Shared pictures of their twins’ luxurious nursery
- Described co-sleeping with the twins

This did not generate a loud and immediate public outcry...indicating limited awareness of sleep environment risks
What is wrong with this picture?

Jennifer Lopez’s nursery
Unsafe Sleep Images in Advertisements

SO SAFE & COMFORTABLE, THEY WON'T WANT OUT

RECARO Convertible Seat features:
1. Original RECARO Side Impact Protection
2. Adjustable headrest
3. 5-point harness

Every RECARO Convertible Seat features:
(1) Original RECARO Side Impact Protection,
(2) an adjustable headrest and (3) a 5-point harness.

With safety features like these, you might start to wonder why you’d ever take your child out of one.

For more information, call or visit online:
1.800.8.RECARO www.recarokids.com
don't get cute, get RECARO

NEW BABY CONTEST
Enter to WIN!

From the day your baby enters this world, you know only the best will do. That's why Today's Parent has partnered with Sears Canada to offer you six chances to win a $2,000 Sears Gift Card to use toward any baby merchandise available in store.

Enter today for your chance to WIN!
Dangerous Products:
Nap Nanny
1. Baby sleeps in a crib/pack and play/bassinet
2. Baby sleeps on the back
3. Nothing in the sleep area
4. Baby’s face uncovered
5. No smoking around the baby
6. Do not overheat or overdress
7. Firm mattress, tight-fitting sheet
8. No soft bedding in sleep area
9. Use sleeper or SleepSack
Safe Sleep Environment

- Safe crib, firm mattress.
- Avoid chairs, sofas, and water beds.
- No excess bedding, comforters, or pillows.
- Bumper pads and wedges NOT needed.
- No toys or stuffed animals in crib.
What is Cribs for Kids®?

- Created in 1998 by Judy Bannon, Executive Director of S.I.D.S. of PA
- Provides sleep-related death risk reduction, safe sleep education, and portable cribs to low-income families.
- To date has acquired 620+ partners across the US.
- In Allegheny County, hospital-based program.
- Since 1998, has provided over 25,500 cribs to families in Allegheny County, Pittsburgh, PA
**Why do we need Cribs for Kids®?**

- Crib and baby equipment recall
  - Liability for distribution of used equipment
- Unstable employment
- Parent empowerment
- Consistent safe sleep message to all care providers
  - Parents
  - Grandparents
  - Child care centers
  - Babysitters
Cribs for Kids®
Graco Pack ‘n Play® Portable Crib
Please Keep Me Safe

Back to Sleep

For naps & at night to reduce the risk of SIDS & accidental suffocation

Now I lay me down to sleep,
Alone in my crib, without a peep.
On my back, in smoke-free air,
Thank you for showing me that you care.

Available in English & Spanish
How does it work in PA?

• PA House Bill 47 (Act 73) mandates that every mother who gives birth in Pennsylvania, in a hospital or birthing center is given infant safe sleep and SIDS risk reduction education. After the family is educated they sign an acknowledge form stating that they have received and understand this information.

• If they do not have a safe place for the baby to sleep they are given a Pack ‘n Play® portable crib through the hospital based Cribs for Kids® program in Allegheny County or referred to a local Cribs for Kids® Partner program.

• Implemented beginning in January, 2011.

• 19.2% decrease in infant sleep-related deaths between 2010 and 2011.

Hurray for safe sleep!!!
“Five Ladies and a Forklift”
The Cribs for Kids® Crew

← Pictured left to right

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www.cribsforkids.org
We have the knowledge today to keep babies safer during sleep...

“Knowing is not enough; we must apply. Willing is not enough; we must do.”

- Goethe