

Cribs for Sleeping, Car seats for Travelling
Danger in using sitting and carrying devices for sleeping infants



Let's Talk PA AAP
April 19, 2016



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Corner Aisle Nursing follows to 3 infant deaths



Investigation by Penn State Milton S. Hershey Medical Center
and Penn State Hershey Children's Hospital



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Blindfold Death



The health of both women with drug exposure to mother
is not at stake!



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How many infants die each year?
And why?



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2013
Postneonatal Mortality
(28-364 days)

Source: CDC WONDER

	2013 US	PA
Total	7,237	299
I95 (Sudden Infant Death Syndrome - SIDS)	1,422	41
I99 (Other ill-defined and unspecified causes of mortality)	377	41
W75 (Accidental suffocation and strangulation in bed)	723	20
Q24.9 (Congenital malformation of heart, unspecified)	281	
A09.0 (Other and unspecified gastroenteritis and colitis of infectious origin)	220	13
J64.4 (Other disorders of lung)	135	
V00 (Assault by unspecified means)	130	
Q01.3 (Edema of newborn, unspecified)	121	
Q23.4 (Hypoplastic left heart syndrome)	110	
A41.9 (Septicemia, unspecified)	105	10

US- 40%
PA - 39%



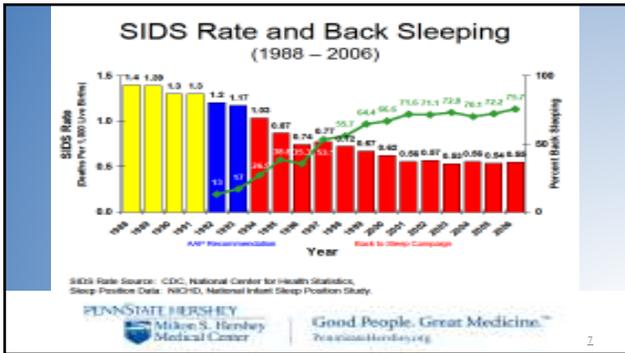
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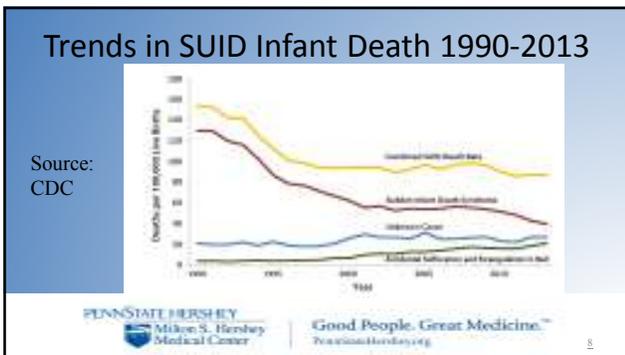
SUID – Sudden Unexpected Infant Death

- Infant < 1 year of age
- Occur suddenly and unexpected
- No obvious cause prior to investigation
- About 3,500 infants/year in US



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Sudden infant death in history

- Throughout history – overlaying of infants was assumed cause of sudden infant death
- Bible – Old Testament – Judgment of Solomon resulted from infant dying by overlay by one of the mothers

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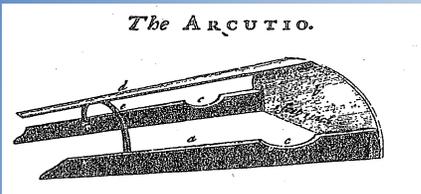
Judgment of Solomon



The Judgment of Solomon, 1649, Nicolas Poussin

Arcuccio – little arch

The Arcutio.



History

- 1940's – articles stating that infectious disease as cause; emphasized not "blaming" parent
- Dr. Woolley in 1945 – infants able to avoid any suffocating positions

1944 - New York Dr. Abramson

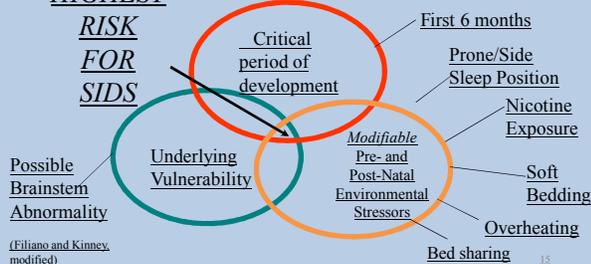
Attention is called to the excessive number of infants under 1 year of age who are dying from accidental mechanical suffocation. These fatalities have shown a progressive increase each year to the point where accidental mechanical smothering now holds the dubious distinction of being the leading cause of accidental death in early infancy.

SIDS - definition

- 1969-NIH conference, with revision in 1991
- Sudden death of an infant under 1 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 clinical history

Triple Risk Model to Explain SIDS

**HIGHEST
RISK
FOR
SIDS**



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Sudden Unexpected Infant Deaths: Sleep Environment and Circumstances

David S. Sanders, MD, Thomas R. Gargano, PhD, and Robert D. Shaddy, MD

- Objective: Describe characteristics and sleep circumstances of infants who die suddenly and unexpectedly
- Methods: 9 states, 2005-2008; 3136 SUID deaths
 - SIDS n=960 30%
 - Suffocation n=939 30%
 - Undetermined n=1237 40%

AJPH. 2012 Jun; 102(6): 1204-12

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State	Sudden Unexpected Infant Deaths				Total
	SIDS No. (n) (%)	Suffocation No. (n) (%)	Undetermined No. (n) (%)	Total No. (n) (%)	
Overall	960 (30)	939 (30)	1237 (40)	3136 (100)	
Female	502 (52)	473 (52)	603 (52)	1578 (50)	
Male	458 (48)	466 (50)	634 (50)	1558 (50)	
Age					
0-11 mo	882 (92)	857 (91)	1093 (88)	2832 (90)	
12-23 mo	78 (8)	82 (9)	144 (12)	304 (10)	
Season					
Spring	242 (25)	238 (25)	303 (24)	783 (25)	
Summer	248 (26)	242 (26)	311 (25)	801 (26)	
Fall	232 (24)	228 (24)	297 (24)	757 (24)	
Winter	258 (27)	231 (25)	326 (26)	815 (26)	
Month					
July	17 (2)	15 (2)	21 (2)	53 (2)	

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Child Death by Injury				
	Deaths (Age 0-19)	Rate (per 100,000)	Deaths (Age 0-19)	Rate (per 100,000)
Total	102 (2011)	104 (2011)	102 (2012)	104 (2012)
Motor Vehicle				
As a driver	40 (2011)	40 (2011)	40 (2012)	40 (2012)
As a passenger	28 (2011)	28 (2011)	28 (2012)	28 (2012)




Sudden Unexpected Infant Death: Sleep Environment and Circumstances

– Conclusion:

- Identification of modifiable sleep environment risk factors in a large proportion of SUIDs, regardless of ultimate cause of death classification.




Sitting and Carrying Devices

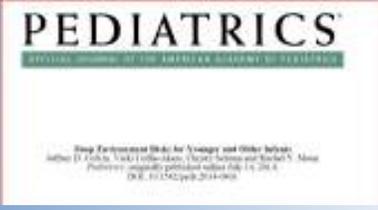





TABLE 1. RISK FACTORS FOR SIDS BY AGE GROUP

Risk Factor	0-3 Months		4-12 Months	
	OR	95% CI	OR	95% CI
Age at death	1.00		1.00	
Female	1.00		1.00	
White	1.00		1.00	
Black	1.00		1.00	
Hispanic	1.00		1.00	
Maternal education	1.00		1.00	
<High school	1.00		1.00	
High school	1.00		1.00	
Some college	1.00		1.00	
College graduate	1.00		1.00	
Maternal occupation	1.00		1.00	
Professional	1.00		1.00	
Service	1.00		1.00	
Unemployed	1.00		1.00	
Maternal smoking	1.00		1.00	
Never	1.00		1.00	
During pregnancy	1.00		1.00	
During infancy	1.00		1.00	
Maternal alcohol use	1.00		1.00	
Never	1.00		1.00	
During pregnancy	1.00		1.00	
During infancy	1.00		1.00	
Maternal depression	1.00		1.00	
Never	1.00		1.00	
During pregnancy	1.00		1.00	
During infancy	1.00		1.00	
Maternal history of SIDS	1.00		1.00	
Yes	1.00		1.00	
No	1.00		1.00	

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WHAT'S KNOWN ON THIS SUBJECT: Sudden infant death syndrome and other sleep-related causes of infant mortality have several known risk factors. Less is known about the association of those risk factors at different times during infancy.

WHAT THIS STUDY ADDS: Risk factors for sleep-related infant deaths may be different for different age groups. The predominant risk factor for younger infants is bed-sharing, whereas rolling to prone with objects in the sleep area is the predominant risk factor for older infants.

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Sleep Environment Risks for Younger and Older Infants
Colvin, et al. *Pediatrics* 2014; 134:e406-412

- **CONCLUSIONS:** Sleep environment risks factors for infants may be different for different age groups.
- 0-3 months - bedsharing
- 4-12 months – rolling to prone with objects in sleep area

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Bed sharing and the Risk of Sudden Infant Death Syndrome: Can We Resolve the Debate?

- Vennemann, et al
- *J Pediatr* 2011
- 11 study meta-analysis
- “Bed sharing is a risk for SIDS and is especially enhanced in smoking parents and in very young infants”



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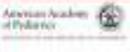
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Academy of Breastfeeding Medicine (ABM) Clinical Protocol #6: Guideline on Co-Sleeping and Breastfeeding Revision, March 2008

- Bed sharing with younger babies 8–14 weeks of age may be more strongly associated with SIDS.



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PEDIATRICS

SIDS and Other Sleep-Related Infant Deaths:

Expansion of Recommendations for a Safe Infant

Sleeping Environment

2011, reaffirmed 2014




AAP Policy Statement 2011

Level A Recommendations

1. Back to sleep for every sleep
 - side sleeping is not safe
 - supine position does not increase the risk of aspiration, even those with GER
 - elevating the head of the crib is not recommended
 - preterm infants should be placed supine as soon as medically stable




AAP Policy Statement 2011

Level A Recommendations

- 2. Sleep surface
 - infant should not be placed on beds due to risk of entrapment/suffocation
 - Sitting devices: car seats, strollers, swings, infant carriers and slings are NOT recommended for routine sleep
 - if infant falls asleep in a sitting device, he should be removed from the product and moved to a crib as soon as practical




AAP Policy Statement 2011

Level A Recommendations

3. Room-sharing without bed-sharing
 - devices promoted to make bed-sharing safe are NOT recommended
 - infants can be brought into bed for feeding but returned when parent ready to sleep
 - do not feed on couch or armchair with high risk that parent might fall asleep

AAP Policy Statement 2011

Level A Recommendations

4. Keep soft objects and loose bedding out of the crib to reduce SIDS, suffocation, entrapment, and strangulation
 - no evidence that bumper pads reduce injury; potential for suffocation, entrapment



AAP Policy Statement 2011

Level A Recommendations

8. Breastfeeding – associated with reduced risk of SIDS
9. Consider offering a pacifier at nap/bedtime – unclear mechanism
 - no strings/attaching to infant clothing
 - breastfed infants – delay until feedings well established



Technical Report

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.



Health Disparities and Safe Sleep

- Minorities across the world have 2-3 time higher rates of sleep related infant death
- Risk factors: bed-sharing, smoking, prone position
- Allegheny County Health Dept – 17 x higher rates for minorities !!!



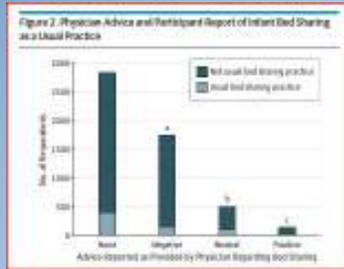
What do our patients hear?



*54% did not recall getting advice

*If they did get advice against bedsharing – parents were less likely to bedshare

NISP, JAMA, 2013



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Safe Sleep MESSAGE

- **A**lone – NOT in parent’s bed
- **B**ack – not side or stomach
- **C**rib – not couch; no loose bedding
- **+** Pacifier, No tobacco, and Breastfeed
(adapted from Baltimore City Health Dept.)



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Aspiration: Supine vs Prone

Back – less likely to aspirate due to trachea lying above esophagus



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Mechanisms of Accidental Suffocation and Strangulation in Bed (ASSB)

- ❑ Suffocation by soft bedding, pillow, waterbed mattress
- ❑ Overlaying (rolling on top of or against baby while sleeping)
- ❑ Wedging or entrapment between mattress and wall, bed frame, etc
- ❑ Strangulation (infant's head and neck caught between crib railings)



*All could be designated as ICD-10 code W75



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MESSAGE

- Tell them why -
 - Adult bed – suffocation by adult or pillows/bedding



Nursery from Jennifer Lopez



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Hazards Associated with Sitting and Carrying Devices for Children Two Years and Younger

Rick F. John, MD¹, Jonathan S. Magid, PhD², and Rachel Y. Han, MD^{3*}

Objective: To analyze reported mechanisms of injury and characterize risk factors for infants and young children <2 years of age who died in sitting and carrying devices.

Study design: A retrospective review of deaths involving sitting and carrying devices (car seats, booster seats, strollers, and strollers) reported to the US Consumer Product Safety Commission between 2003 and 2008.

Results: Of 164,427 deaths analyzed, 31 occurred in car seats, 5 in strollers, 4 each in strollers and boosters, and 3 in strollers. The reported elapsed time between the last time a child was seen by a caregiver and found deceased varied greatly, with a mean of 26 minutes in strollers, 32 minutes in strollers, 140 minutes in car seats, 100 minutes in boosters, and 260 minutes in strollers. The cause of death was asphyxiation in all cases except one. Fifty-five percent of deaths in car seats were attributed to strangulation from straps; the others were attributed to positional asphyxia.

Conclusions: Infants and children 2 years of age and younger should be properly restrained and not be left unattended in sitting and carrying devices. Car seats should not be used as sleeping areas outside of the vehicle, and children should never lie in car seats with limbs folded or partially folded. Strollers in strollers should have their faces visible and above the edge of the stroller, should not have their faces covered by fabric, and their chests should not be compressed into their chests. (J Pediatr 2010;157:102-10)



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Table I. Hazards of sitting and carrying devices for children 2 years and younger (mean and median elapsed time and age range for each device)

Device	No.	Mean elapsed time	Median elapsed time	% of total cases	Mean age (months)	Median age (months)	Age range
Car seats	17	14	10	7	16	17	9-124 mo
Strollers	4	4	2	17	7	7	12-20 mo
Swings	4	5	1	9	18	18	12-20 mo
Bouncers	4	1	1	9	25	18	12-20 mo
Strollers	4	2	1	9	17	7	18 mo
Total	33	27	21	100	15	15	

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Table II. Hazards of sitting and carrying devices for children 2 years and younger (mean and median elapsed time)

Device	No. cases with elapsed time	Mean elapsed time	Median elapsed time	Range
Car seats	10	2.3 h	55 min	4 min-11 h
Strollers	4	26 min	16 min	10-60 min
Swings	4	5 h	5 h	1-9 h
Bouncers	3	25 h	2 h	1.5-4 h
Strollers	3	32 min	30 min	5-60 min

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Results

- 27 listed reason why in device
 - 17 sleep
 - 5 travel
 - 4 contain child
 - 1 playing with peers

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Results

- 46/47 from asphyxiation
- Car seats – 52% strangulation from straps
--48% positional asphyxiation

Results

- 15 listed if straps present
 - 13/15 improper use
- Position found
 - 7 found in different position
 - 5 car seats on top of child (2 on beds)
 - 1 swing folded in on itself
 - 1 swing fell with 2 twins in it

Car Seats

Case 1. An 11-month-old boy was placed with a bottle in a car seat for a nap at a home day care center. He was covered with a fleece blanket. The chest buckles were secured, but the lower buckles were unsecured. One hour and 20 minutes later, the child care provider went into the room to check on the child. She saw that he had slipped down in his car seat, such that at least one strap was up against his neck, his color was pale, and he was gasping for breath. EMS was called and the victim was transported to a hospital, where he was declared dead.

Case 2. An 8-month-old girl was placed in a car seat with 3 blankets and 1 infant pillow. Safety restraints were not used. The car seat was placed in a crib. The infant's neck became caught between the edge of the car seat and the attached folded sunshade. She was transported to a hospital, where she died 2 days later.



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Swings

Case 4. After being fed, an 18-day-old boy was placed to sleep with 2 blankets in a portable infant swing. When the victim's mother awoke an hour later, she discovered that he was not breathing. CPR was initiated, but he was pronounced dead at a hospital. It is unknown whether restraint straps were used.



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Bouncers

Case 5. A 3-month-old boy was placed for sleep on his back in a bouncer. The father buckled the infant into the seat with the restraint belt and placed a blanket on him up to his waist. Ninety minutes later, the father found the victim face down and unresponsive, with his neck over the top of the bouncer. 911 was called and CPR started; the baby was pronounced dead at the scene. The detective related that the victim had apparently rolled over and pushed up to the top of the bouncer by pushing on the blankets.



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Slings

Case 3. A mother was attending a breastfeeding class with her 26-day-old son. She was wearing a cloth baby sling that was placed like a sash across her chest. The child was breastfeeding inside the sling. The child stopped nursing and was believed to have fallen asleep. Approximately 10 minutes later the mother noticed that her son was unresponsive.

Cardiopulmonary resuscitation (CPR) was initiated. The child was transported to a hospital and pronounced dead.



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Strollers

Case 6. An 8-month-old girl was sleeping unattended in stroller at the mother's workplace. The restraint belt was not fastened. The mother returned to the room after 5 minutes and found her partially hanging out of the stroller, her head wedged between the lower edge of the tray and the front edge of the seat. She was unconscious and not breathing, so CPR was initiated. She was resuscitated but was in a vegetative state, and life support was withdrawn 2 days later.



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Recommendations

Infants/young children should not be left unsupervised in sitting/carrying device

Never be in car seat with unbuckled or partially buckled straps

Never place car seat on soft or unstable surface



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Recommendations

- Infants in bouncers, strollers, and swings may be able to maneuver into positions that could compromise their airway; straps on these devices may not prevent infants from getting into hazardous situations



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Recommendations

Parents should ensure that infants cannot twist their heads into soft bedding or slump forward in a seat; and parents should always use the restraints provided according to manufacturer's instructions.



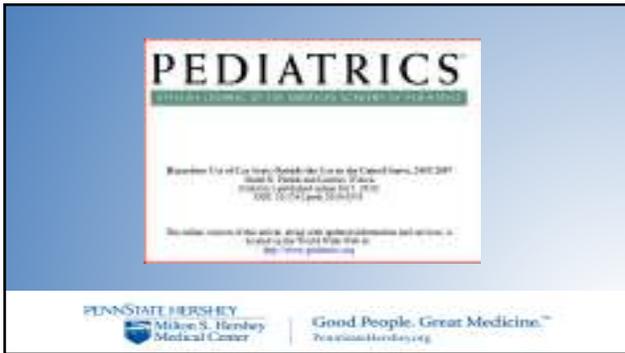
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Recommendations

Slings are particularly hazardous because of their design and the ease with which an infant's airway can be collapsed. If used, the baby's face should be visible, not covered by any fabric, the chin should not be compressed into the chest, and the face should be above the edge of the sling



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Use outside of car

- Estimate of 43,562 (8712 /yr) car seat injuries 2003-2007
- Avg age: 4 mos +/- 2.7 months
- 49% home
- 8% hospitalized
- 84% head injury



Use outside of car

- Avoid placement on elevated or soft surfaces
- Common fall from: shopping cart (81%), table, counters
- Common fall on: floor (27%), concrete/pavement (10%), ground
- 3 deaths

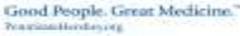


ARTICLE

Use of Seating Devices in Infants Too Young to Sit

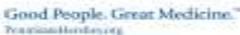
JGIM: Charles W. Gilliam, DO, MC, LISI; Cheryl Sibley, MD

Arch Pediatr Adolesc Med 2009;163:110-113

Future couch potato?

- 94% spent 30 min or longer
- Mean time 5.7 +/- 3.5 hours
- Range 0-16 hrs

Risk of car seat

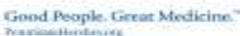
Journal Article
DOI: 10.1001/archpedi.163.1.110

ORIGINAL ARTICLE

Sudden unexpected infant deaths associated with car seats

Andrew B. Shapiro, MD, PhD, FAAP
Michael T. Ashworth, MD, FAAP

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SUID in car seats

- 14 car seat deaths out of 1465 autopsies
- 4 appropriately transported- medical cause
- 10 inappropriately used – outside of car (5 explained, 4 unexplained, 1 no cause available)



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SUID in car seat

- No case of previously healthy infant dying unexpectedly when used properly
- Recommendation that car seats be used only for transport and not as alternatives for cots or high-chairs



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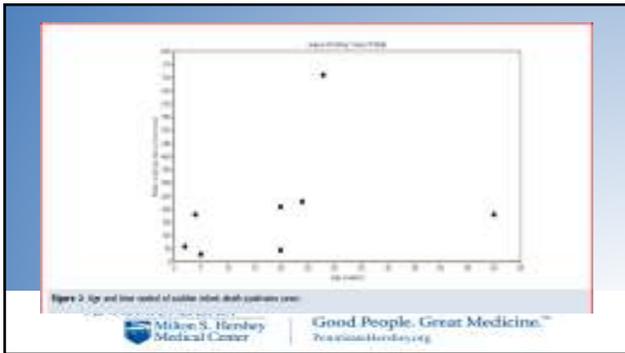
Sudden infant deaths in sitting devices

A. Côté,¹ A. Bairam,² M. Deschêres,² G. Holzapfel¹

Ann. Am. Coll. Child Neurol. 2014; 11(1): 1-10



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Apparently life threatening events in infant car safety seats
 Mátty E. Tankin, Sally A. Vogel, Laura Brunet, Abigail Jan Gunn

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ALTE in Car Seats

- 9 infants identified
- Median age – 5 weeks (3 days – 6 mos)
- 5 mother’s smokers

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Give them tools



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The ABC's of Safe Sleep



Alone

Not with other people, pillows, blankets, or stuffed animals.



on my Back

Not on the stomach or side.



in my Crib

Not on an adult bed, sofa, cushion, or other soft surface.



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AND....

- Not in a car seat (including after the age of 1)
- Not in bouncer
- Always use manufacturer buckles/straps

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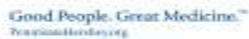
Resources

Cribs for Kids

<http://www.cribsforkids.org/>

- General information
- Hospital Toolkit (Education -> Healthcare Professionals -> Hospital Initiative Toolkit)
- Information to start a Cribs for Kids chapter





Resources

NICHD "Safe to Sleep" Campaign

<http://www.nichd.nih.gov/sts>





Thank you!

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Safe Sleep For Your Baby

1. Baby sleeps in crib.
2. Baby sleeps on back.
3. Sleeping in baby's crib.
4. Baby's face uncovered.
5. No bedding around baby.
6. Crib meets standards for construction.
7. Use mattress, tight fitting sheet.

A - alone (no bedsharing)
B - back
C - crib
