Pediatrics Vol. 105 No.4:915-920 April 2000

Letters To The Editor

Sleep Location and Suffocation: How Good Is the Evidence?

(Critical responses by the pediatric research community to the recommendation against bedsharing by Drago and Dannenberg (1999), USA Consumer Product Safety Commission consultants)

To the Editor.—

In their article "Infant Mechanical Suffocation Deaths in the United States, 1980–1997," Drago and Dannenberg analyze a case series of 2178 infant deaths that they classified as "suffocation" based on the Consumer Product Safety Commission's (CPSC) Death Certificate File (DCF), providing a sobering reminder of environmental hazards to infants, such as wedge spaces around mattresses/cushions and strangulation risks from cords or widely spaced crib rails.[1] However, the data do not necessarily support their recommendations that "bed sharing and the use of adult beds for infants should be discouraged" or that regulations should "forbid the use of a bed for an infant or toddler." Such recommendations require knowledge of the *relative risk* of different sleeping *locations* (eg, cribs vs playpens vs beds, etc), information which is not discernable from the CSPC-DCF for two reasons. First, the denominator is unknown (the proportion of time infants in the population spent in each location). We will focus on the second and more complicated issue of numerator reliability.

Concerns about the reliability of case definition stem first from variability in the gathering, interpretation, and reporting of information to the CPSC.[2,3] Variation arises from 1) inconsistent data collection procedures, 2) disparate qualifications of those who investigate and certify death, with certifiers ranging from coroners with no medical training to forensic pathologists, and 3) lack of objective criteria to distinguish suffocation from sudden infant death syndrome (SIDS).[4] As an example of possible resulting classification bias, O'Hara noted a geographic clustering of the suffocation subcategory "overlaying" on review of the CPSC-DCF data since 1995. Certifiers from areas where the term was used most frequently related by phone interview that they would not diagnose SIDS in the context of co-sleeping, assuming sleep location to be a possible contributory factor. In contrast, some other certifiers classify an infant death in any location as SIDS unless evidence of a specific etiology is found. Only the former cases would likely be classified as a type of "suffocation" in the authors' analysis, increasing both the number of deaths ascribed to suffocation and the apparent percentage of suffocation deaths involving beds and co-sleeping.

Classification is also limited by the scant amount of information provided to the CPSC, consisting only of a code for the cause of death (E-code), a one-line narrative, and demographic information. Based on such sparse data, the authors note that their classifications proved to be inaccurate for half of the subset (18/38) of crib-related deaths that were compared with in-depth investigations by the CPSC.[1] Unfortunately, no validation of accuracy was presented for the cases involving beds and/or more speculative mechanisms of death (eg, case 9734052045: "baby found unresponsive, father slept in same bed: asphyxiation by overlay [sic]"[5]). Reasons to question classifications related to beds and co-sleeping include 1) the inability of E-codes to distinguish beds from cribs, 2) possible use of the general term "bed" in the narrative to refer to a variety of specific sleeping locations, 3) lack of any information about co-existing environmental risks (eg, caregiver intoxication), and 4) the potential for cultural beliefs about proper sleep location to influence the interpretation of death circumstances.

History has humbled us with the hazards of making strong recommendations about infant sleep without an adequate empiric basis. One example is the widespread recommendation in the 1950s to place infants prone, followed decades later by the recognition that prone sleeping is a major risk factor for SIDS.[6] Similarly, premature recommendations about optimal infant sleep *location* might 1) unnecessarily limit cultural choices about infant care, 2) subject parents to unfounded guilt/blame, 3) obscure the need for further research, and 4) inadvertently compromise child health. This is particularly important in light of evidence[7–10] suggesting that co-sleeping may be protective against SIDS. In addition, co-sleeping facilitates breastfeeding,[11] which in turn has significant benefits for maternal and child health.[12] Until better data are available to determine the impact of infant sleeping *location* on overall infant health, we should focus our recommendations on evidence-based information about infant sleep *position* and *environment*.

MARYANN O'HARA, MD, MSt
Robert Wood Johnson Clinical Scholars Program
University of Washington
Seattle, WA 98104

RICHARD HARRUFF, MD, PHD
Acting Chief Medical Examiner
Public Health Department
Seattle, WA 98104
President-elect of the Washington SIDS Foundation

JOHN E. SMIALEK, MD*
DAVID R. FOWLER, MB, CHBM‡
*Chief and ‡Deputy Chief Medical Examiners
Office of the Chief Medical Examiner for the State of Maryland
Baltimore, MD 21201

REFERENCES

1. Drago DA, Dannenberg AL. Infant mechanical suffocation deaths in the United States, 1980–1997. *Pediatrics*. 1999;103(5). URL: http://www.pediatrics.org/cgi/content/full/103/5/e59
2. US Consumer Product Safety Commission. A description of the Death Certificate Project and its data files. Washington, DC, 1998
3. Sturner WQ. Common errors in forensic pediatric pathology. *Am J Forensic Med Pathol*. 1998;19:317–320
4. Sheers NJ. Infant Suffocation Project: fiscal year 1993 status report. Washington, DC: US Consumer Product Safety Commission, 1993
5. US Consumer Product Safety Commission. Death Certificate File. Washington, DC, 1995–1998
6. Mitchell EA, Ford RP, Taylor BJ, et al. Further evidence supporting a causal relationship between prone sleeping position and SIDS. *J Paediatr Child Health*. 1992;28:59–12
7. Farooqi S. Ethnic differences in infant care practices and in the incidence of sudden infant death syndrome in Birmingham. *Early Hum Dev*. 1994;38:209–213
8. Mosko S, Richard C, McKenna J, Drummond S, Mukai D. Maternal proximity and infant CO2 environment during bedsharing and possible implications for SIDS research. *Am J Phys Anthropol* 1997;103:315–328
9. 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;100:841–849
10. 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;16:263–82
11. McKenna J, Mosо S, Richard C. Bedsharing promotes breastfeeding. *Pediatrics*. 1997;100:214–219
12. American Academy of Pediatrics. Working Group on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 1998;100:1035–1039

In Reply.—

O'Hara et al have raised concerns about the validity of the data to support conclusions by Drago and Dannenberg, stating that knowledge of relative risk of different sleeping locations is necessary before we can discourage the use of adult beds or bed-sharing for infants, and before we can recommend regulations to forbid the use of a bed for an infant or toddler. They also question the reliability of the data in view of possible variations in procedures for gathering, reporting, and interpreting the data.

First, it is important to clarify that the recommendation for a regulation to forbid the use of a bed for an infant or toddler was offered only for daycare settings. We believe this is an appropriate recommendation because daycare providers may not always be aware of hazards associated with sleeping, and because their motivation for using a bed instead of a crib is probably for convenience rather than for bonding, feeding, or reducing the risk of SIDS.

We do not necessarily agree that one always needs relative-risk data to recommend injury intervention strategies. Intervention strategies address ways to reduce or eliminate hazards and contributing factors, based on what is known about how the injuries occur. Because mechanical suffocation is the leading cause of unintentional death among infants, and because 30% of the infant suffocation deaths reported to CPSC involved beds, it would be irresponsible to not look to solutions which address the bed. Relying on behavioral interventions to make a bed safe (such as changing attitudes and behavior about soft mattresses, pillows, fluffy bedding, and the location of a bed against the wall) reduces the likelihood that the intervention will succeed. Most products for infants, including cribs, playpens, high chairs, and toys, meet either a mandatory federal safety requirement or a voluntary industry safety standard. Such regulations and standards typically incorporate design or performance specifications, and although they may include to some complementary degree a behavioral intervention component, that is certainly not their primary focus.

We do agree that there probably is variation in the way in which coroners, medical examiners, etc, investigate and certify deaths and also that there may be inconsistencies in coding causes of death and/or products involved. Nonetheless, we believe the number (2178) of cases in our study reasonably reflects infant suffocation deaths associated with consumer products. The Consumer Product Safety Commission (CPSC) has always collected data on deaths with the E-Code 913; therefore, we do not agree that data collection procedures varied during the period our study covers. More than 90% of the cases in our study had been assigned this E-Code.

Although we agree that the narrative in the CPSC database is scant, there is a product code, which O'Hara et al fail to mention, that was used by the authors in conjunction with the narrative text to arrive at a product code for the study. Because only one person (Drago) assigned product codes for the study, any errors would have at least been systematic.

The attempt to use the reported revision of codes for 18 of 38 cases in a subset to support the contention of data inaccuracy is flawed. The subset was in no way representative of the data set. Further, it should be noted that 8 of the 18 cases in question had been coded as "mechanism unknown" and that the additional information only served to allow a more accurate classification; the remaining 10 of the 18 had been coded as "wedgings," whereas 9 were found to be a special circumstance of wedging, namely, "entrapment with suspension." Only one case would have to be reversed from "wedging" to "unknown."

As for misclassification of SIDS deaths as "overlaying," that may be true to some degree; however, because there are no objective criteria for distinguishing SIDS from mechanical suffocation, that distinction relies on evidence from the death scene. The number of "overlain" cases in our study was 180, less than 10% of the data set, with 102 of 180 (56%) occurring in a bed. Whereas O'Hara et al noted a geographic clustering of "overlaying" in their data review, our study showed that one state (Michigan) was the source of 15 cases; 3 states (Indiana, Texas, and Wisconsin) were the sources of 10 cases each; five states (California, Georgia, Illinois, New Jersey, and Pennsylvania) were the sources of 7 to 9 cases each. We cannot draw any conclusions about clustering.

It is important to appreciate that nearly one third of the cases in our study involved beds, and that except for the small number of cases coded as "overlain," the authors drew no conclusions about bed-sharing. The point is that whether an infant is placed in a bed alone or with another person, there are immediate hazards presented to the infant which would not be presented by the use of a compliant crib. If the positive aspects of bed-sharing are publicized, the hazards associated with bed-sharing also need to be made known.

DOROTHY A. DRAGO, MA, MPH
Product Safety Consultant
Gaithersburg, MD

To the Editor.—

We are writing to express our concern with several of the points raised in the recent article by Drago and Dannenberg (Drago DA, Dannenberg AL. Infant mechanical suffocation deaths in the United States, 1980–1997. *Pediatrics*. 1999;103:(5). URL: http://www.pediatrics.org/cgi/content/full/103/5/e59).[1] The authors suggest that the reported increase in infant deaths by suffocation and "overlying" could be the result of "an increase in the rate of infant-parent co-sleeping related to reported benefits, including increased breastfeeding and reduction in the rate of SIDS. . . ." They acknowledge that rates of co-sleeping are unknown and that this association is theoretical.

Mother-infant co-sleeping evolved to protect and feed infants throughout the night.[2] Millions of mothers worldwide know that strong emotions underlie and motivate co-sleeping, even though they may be unaware of co-sleeping as a biologically appropriate arrangement which, in turn induces important behavioral and physiological changes in both infants and mothers. These changes have been reported in extensive peer-reviewed laboratory studies[3–8] and include increased use of the safe, supine infant sleep position, increased breastfeeding, increased infant movement, arousal and awakenings during sleep, reduced deep and increased light sleep, more affectionate and protective maternal interventions, increased sensitivity to the presence of the co-sleeping partner, reduced infant crying, fewer (infant) obstructive ap-

neas in deep sleep, longer infant sleep, and more positive evaluations by bedsharing mothers of their nighttime experiences.[3-8]

It has been estimated that more than half of the families in the United States practice co-sleeping with infants for some period of time. Drago and Dannenberg casually dismiss the biologically important role of co-sleeping when they state: "New parents may take their infants to bed with them. . .for feeding convenience." Catastrophic accidents in the co-sleeping environment are tragic exceptions to the act of co-sleeping itself and are almost always attributable to avoidable, unsafe conditions, most frequently found in high-risk populations where most such tragedies occur. In recent years in Cook County, Illinois (Chicago), the medical examiner has found that *all* overlying deaths were in situations in which the adult was intoxicated with either alcohol or illegal drugs. We agree with the authors and others that special precautions need to be taken to minimize catastrophic accidents, but the need for such precautions is no more an argument against all co-sleeping and, specifically, bedsharing, than is the reality of infants accidentally strangling, suffocating or dying from SIDS alone in cribs a reason to recommend against all solitary, unsupervised infant sleep (cribs). The goal is to avoid dangerous adult beds, and dangerous bedsharing conditions, while preserving the proven benefits of co-sleeping in safe beds involving safety-conscious adults, if that is the parents' choice.

Breastfeeding (at an all-time recorded high in the United States) and co-sleeping in the form of bedsharing mutually reinforce each other.[9,10] That is, studies show that bedsharing increases the frequency and duration of nightly breastfeeding, while breastfeeding makes bedsharing convenient for mothers, thereby increasing the chances of its adoption as a routine practice.[4] Maintenance of breastfeeding is a proven preventive action against increased infant illness and death, even in developed countries, and a significant factor in reducing maternal illness. It is unfortunate that Drago and Dannenberg were unable to report the specific conditions and/or circumstances in which alleged overlaying and other bedsharing infant deaths occurred. It is those specific conditions that transform co-sleeping (in the form of bedsharing) into something potentially dangerous. Of the total bedsharing deaths they report, it is important to know, for example, how many infants were found lying prone, or were sleeping on sagging mattresses, on waterbeds, or sofas—all highly risky forms of co-sleeping. Of the bedsharing deaths, how many mothers smoked during their pregnancies, or smoked at the time of the infant's death, laid their babies prone for sleep, were intoxicated, used drugs, or were perhaps unaware that the baby was sleeping alongside? Was there a previous infant or child death in the family, suggesting possible infanticide or a Munchausen-by-proxy syndrome? Of even greater importance is the question: how many of these overlays involved nonsmoking, non-intoxicated, breastfeeding mothers? These data are critical to assess the actual causes of death. Mere location of infant sleep is insufficient for assessing the actual cause of the tragedy.

Furthermore, it is important to recognize that an infant can die from SIDS while bedsharing without any contributory role from co-sleeping. Most adults die in bed, but we do not indict the bed as a factor in causing the death. Cultural biases against mother-infant co-sleeping in our society make it very difficult to think of a bedsharing death simply as yet another tragic SIDS. All too frequently the assumption is that the adult in the bed probably overlaid the baby either accidentally or purposefully. Unfortunately, autopsy examination is unable to differentiate between "SIDS" and suffocation in the absence of physical signs of injury. A priori assumptions make it less likely that an accurate assessment will be achieved.

The distinction between co-sleeping and particular forms of it, like *bedsharing*, was introduced several years ago as a way to make more precise the discourse surrounding co-sleeping and SIDS[11,12] and to help clarify and potentially reconcile the legitimate diverse positions argued by researchers in this controversial area. The authors erroneously use these terms interchangeably. Co-sleeping takes hundreds of different forms worldwide, and no single outcome necessarily can be associated with it. Differential outcomes for different types of co-sleeping, including different types of bedsharing, can be predicted only by considering both the nature of relationships involved while co-sleeping (what happens between the caregiver and infant once in bed, or outside of the bed) and the qualities of the physical environment and social circumstances within which particular types of infant care (as, for example, breastfeeding) are integrated with, or are absent from, the act of co-sleeping.

That a proactive, involved, and nurturing caregiver changes the outcomes in the co-sleeping environment are suggested by the New Zealand epidemiological study showing that when infants sleep in the same room with their mothers, but not when sleeping in a room with siblings, they are four times less likely to die from SIDS.[13] Similarly, the CESDI (Great Britain) epidemiological study shows that infants who sleep in a separate room alone are more likely to die from SIDS than are infants of nonsmoking mothers who are brought in and out of their mother's bed throughout the night for breastfeeding, and who are kept in the room, close to the mother all night long.[14] Moreover, Japan exhibits the lowest SIDS rates in the world and, there, mother-infant co-sleeping (on floor-positioned futons) is the cultural norm! By distinguishing between co-sleeping in a generic sense and particular forms of co-sleeping (such as safe bedsharing, exhibited by breastfeeding, nonsmoking mothers sleeping on firm mattresses vs unsafe bedsharing, exhibited by non-breastfeeding, smoking mothers sleeping on soft, over-blanketed beds) health professionals can preserve and acknowledge the importance of parents and infants sleeping within arms reach—within proximity (co-sleeping).

Drago and Dannenberg speculate that the increase in overlay deaths in the last decade might be attributed to the promulgation and acceptance of McKenna's documented benefits of co-sleeping in the form of safe bedsharing. At the very least, information on why the parents or caregivers of overlain infants elected to bedshare as well as data on whether or not they did so *safely* on the night the infant died, would be required before such an assertion could be proven. Sound scientific methods and procedures were used in all of McKenna's studies, and all work was peer-reviewed on multiple occasions. It is true that the AAP Committee on Infant Sleep Position sees no reason to recommend bedsharing as a way to reduce SIDS (and, at this point, neither does McKenna). It is also true that AAP committee warns appropriately (as does McKenna and colleagues) that under special unsafe circumstances bedsharing can increase SIDS risk; nevertheless, there remain valid, peer-reviewed data which justify scientific speculation that under safe bedsharing/co-sleeping circumstances (especially where breastfeeding is involved), infants may have an increased chance to avoid a SIDS death. This speculation emerged initially from a detailed peer-reviewed monograph, which proposed a theoretical model and a series of testable hypotheses, all of which integrated cross-cultural SIDS epidemiology, and developmental, experimental, and evolutionary data.[15] It led to two pilot studies of mother-infant co-sleeping[16,17] and a carefully controlled NICHD-funded scientific study which documented significant physiological and behavioral changes in sleep, arousal, and feeding patterns induced by the presence of a breastfeeding, co-sleeping mother.[18] At least 10 peer-reviewed articles have been published, two of which appeared in *Pediatrics*.

The criticisms we raise should not detract from the value of other information Drago and Dannenberg present concerning the etiologies of infant mechanical suffocation. What is evident from this report is that no sleep environment is risk free, and that much more can be done to educate parents as to how to provide safer sleeping environments. Furthermore, it is clear that the types of precautions required to maximize safety under different sleeping conditions (both social and solitary) are shown often to be the same: mattresses should be firm and tight-fitting to their frames, infants should not be overwrapped, or their heads covered by blankets, placed prone for sleep, or permitted to sleep on pillows, etc. And although some precautions are unique to bedsharing, they do not negate the validity of the choice, when practiced safely. At this point in the history of western societies, where an unprecedented convergence of cultural practices is underway—not the least of which involve sleeping arrangements—it is critical that clinicians and researchers broaden their thinking about what constitutes appropriate and desirable childhood sleep practices. Failure to do so will continue to limit both the accuracy of pediatric sleep science and the effectiveness of care. As we begin the next millennium, infant-parent co-sleeping with breastfeeding is likely to become more, not less, common.[19] We look forward to the time when we join the rest of the world and regard infant-parent co-sleeping not as pathology, but as an appropriate and potentially rewarding choice for fully informed parents when practiced safely.

JAMES J. MCKENNA, PHD
Director, Mother-Baby Behavioral Sleep Laboratory
University of Notre Dame

LAWRENCE M. GARTNER, MD
University of Chicago
Chicago, IL

REFERENCES

1. Drago DA, Dannenberg AL. Infant mechanical suffocation deaths in the United States, 1980–1997. *Pediatrics*. 1999;103:e59
2. Konner MJ. Evolution of human behavior development. In: Munroe RH, Munroe RL, Whiting JM eds. *Handbook of Cross-Cultural Human Development*. New York, NY: Garland STPM Press, 1981:3–52
3. McKenna JJ, Mosko S, Richard C, et al. Mutual behavioral and physiological influences among solitary and co-sleeping mother-infant pairs: implications for SIDS. *Early Hum Dev*. 1994;38:182–201
4. McKenna J, Mosko S, Richard C. Bedsharing promotes breast feeding. *Pediatrics*. 1997;100:214–219
5. Richard C, Mosko S, McKenna J. Sleeping position, orientation, and proximity in bedsharing infants and mothers. *Sleep*. 1996;19:667–684
6. Mosko S, Richard C, McKenna J. Infant arousals during mother-infant bedsharing: implications for infant sleep and SIDS research. *Pediatrics*. 1997;100:841–849
7. Richard C, Mosko S, McKenna J. Apnea and periodic breathing in the bedsharing infant. *Am J Applied Phys*. 1998;84:1374–1380
8. Mosko S, Richard C, McKenna J, Drummond S. Infant sleep architecture during bedsharing and possible implications for SIDS. *Sleep*. 1996;19:677–684
9. Ross Mothers Survey (1997). Published and available through Ross Laboratories, Ross Products Division of Abbott Laboratories
10. Mitchell EA, Scragg L, Clements M. Factors related to infant bedsharing. *NZ Med J*. 1994;107:466–467
11. McKenna JJ, Thoman E, Anders T, Sadeh A, Schechtman V, Glotzbach S. Infant-parent co-sleeping in evolutionary perspective: implications for understanding infant sleep development and the Sudden Infant Death Syndrome (SIDS). *Sleep*. 1993;16:263–282
12. McKenna JJ. The potential benefits of infant-parent co-sleeping in relation to SIDS prevention: overview and critique of epidemiological bed sharing studies. In: Rognum TO, ed, *Sudden Infant Death Syndrome: New Trends in the Nineties*. Oslo: Scandinavian University Press, 1995:256–265
13. Mitchell EA, Thompson JMD. Cosleeping increases the risks of the sudden infant death syndrome, but sleeping in the parent's bedroom lowers it. In: Rognum TO, ed. *Sudden Infant Death Syndrome: New Trends in the Nineties*. Oslo: Scandinavian University Press, 1995:266–269
14. Fleming P, Blair P. Safe environments for infant sleep: community and laboratory investigations or folk wisdom? Symposium on Breast Feeding, Parental Proximity and Contact in Promoting Infant Health. Paper delivered at University of Notre Dame, South Bend, September 1998.
15. McKenna JJ. An anthropological perspective on the sudden infant death syndrome (SIDS): the role of parental breathing cues and speech breathing adaptations. *Med Anthropol*. 1986;10:9–53
16. McKenna JJ, Mosko S, Dungy C, McAninch P. Sleep and arousal patterns of co-sleeping human mothers/infant pairs: a preliminary physiological study with implications for the study of Sudden Infant Death Syndrome (SIDS). *Am J Phys Anthropol*. 1990;83:331–347
17. Mosko S, McKenna JJ, Dicker M, Hunt L. Parent-infant co-sleeping: the appropriate context for the study of infant sleep and implications for SIDS research. *J Behav Med*. 1993;16:589–610
18. McKenna JJ, Mosko S, Richard C. Breast feeding and mother-infant cosleeping in relation to SIDS prevention. In: Trevathan W, Smith N, McKenna J, eds. Oxford, UK: *Evolutionary Medicine*. Oxford, UK: Oxford University Press: Oxford 1999:53–74
19. McKenna J. Cultural influences on infant and childhood sleep biology and the science that studies it: toward a more inclusive paradigm. In: Loughlin J, Carroll J, Marcus C, eds. *Sleep in Development and Pediatrics*. New York, NY: Marcel Dekker; In press

In Reply.—

It appears that Dr. McKenna's work in the field of co-sleeping/bed-sharing causes him to focus on a subset of less than 10% of the 2178 deaths we described. According to Dr. McKenna, bed-sharing, a particular form of co-sleeping, describes the co-occupancy of a bed. Co-sleeping describes sleeping in the same environment, perhaps the same room, usually nearby, and may take a variety of forms. We admit our mistaken use of these terms interchangeably and thank Dr. McKenna for clarifying the issue. We concluded that increased rates of co-sleeping (instead of bed-sharing) could have been a factor for the 102 cases of overlaying in a bed. We drew no conclusions about bed-sharing or co-sleeping for the more than 500 other cases involving beds. In fact, we focused on the location of the bed against the wall as the major hazard.

It was never our intent to weigh the risks and benefits of bed-sharing. We did not address the benefits of co-sleeping because it was never our intent to do anything but better understand the circumstances surrounding infant suffocation deaths.

Drs. McKenna and Gartner believe we casually dismissed the biological importance of co-sleeping by stating, "New parents may take their infants to bed with them. . .for feeding convenience." How convenient for their argument that they omitted a phrase from our sentence. The full sentence reads, "New parents may take their infants to bed with them to enhance infant-parent bonding or for feeding convenience."

It is outrageous and absurd for Drs McKenna and Gartner to compare adult deaths taking place in a bed with infant deaths taking place in a bed. Most adults may die in bed; however, that is a spurious association. Adults do not die stuck between the bed and wall or trapped between the mattress and bed frame, as infants do.

It is also erroneous for them to compare Japanese customs with American customs, when they readily admit that Japanese sleep on floor-positioned futons. If Drs. McKenna and Gartner had provided a description of the typical American bed-sharing scene, I believe it would be quite different from the Japanese.

We agree with Drs. McKenna and Gartner that the goal is to avoid dangerous adult beds for infants, but our study suggests that adults do not recognize what makes a bed safe vs dangerous. We had an obligation to conclude and report that bed location, presence of pillows or soft bedding, and bed-sharing made beds hazardous for infants.

DOROTHY A. DRAGO, MA, MPH
Product Safety Consultant
Gaithersburg, MD

To the Editor.—

I am concerned about the unqualified recommendation against co-sleeping published in your journal by Drago and Dannenberg.[1] The authors argue that the rates of suffocation death by "overlying" have risen in this country over the last 20 years and that co-sleeping should therefore be considered "unsafe." They go as far as suggesting a prohibition against "the use of a bed for an infant or toddler."

There are several flaws in their reasoning. First, "overlying" is a notoriously unreliable autopsy diagnosis. It is frequently impossible to distinguish it from SIDS, which is a much more common condition. Yet, a death from SIDS of a newborn who was sleeping next to his or her parents is much more likely to be mistakenly attributed to "overlying" than a SIDS death occurring in a crib. Clinical experience suggests that true overlying is a rather rare cause of infant death under usual circumstances. Detailed investigations show that confirmed accidents occur primarily when the adults are severely intoxicated by alcohol or drugs or when they are markedly obese.[2] This is not surprising given that a normal adult would be easily awakened by the discomfort caused by lying over a child (as anyone who has ever accidentally lain over a cat can attest).

Clearly, some sleeping arrangements are unsafe for infants. These include soft and deep pillows or comforters, as well as waterbeds. However, this is as true for unsupervised solitary sleeping of infants as it is for co-sleeping arrangements. Instead of a sweeping recommendation against co-sleeping, Drago and Dannenberg would have done a greater service to infant safety if they had emphasized such unsafe bedding.

Secondly, Drago and Dannenberg fail to address the benefits of co-sleeping for parents and children. Co-sleeping can reduce traumatic mother-infant separations that have been shown to have significant long-term negative consequences on psychological development.[3–6] Co-sleeping is also generally acknowledged to facilitate breastfeeding.[7] In contrast, there is no scientific evidence to my knowledge documenting any benefits of solitary infant sleep.

DAVID SERVAN-SCHREIBER, MD, PHD
Chief, Division of Psychiatry
University of Pittsburgh Medical Center, Shadyside
Pittsburgh, PA

REFERENCES

1. Drago DA, Dannenberg AL. Infant mechanical suffocation deaths in the United States, 1980–1997. *Pediatrics*. 1999;103:e59
2. Bass M, Kravath RE, Glass L. Sudden infant death scene investigation. *N Engl J Med*. 1986;315:100–105
3. Harlow HF, Harlow MK. Effects of various mother-infant relationships on rhesus monkey behaviors. In: Foss BM, ed. *Determinants of Infant Behaviour*, Vol 4. London: Methuen, 1969:15–36
4. Meyer J, Novak MA, Bowman RE, Harlow HF. Behavioral and hormonal effects of attachment object separation in surrogate-peer-reared and mother-reared infant rhesus monkeys. *Dev Psychobiol*. 1975;8: 425–435
5. Cummins MS, Suomi SJ. Behavioural stability of rhesus monkeys following various rearing. *Primates*. 1976;17:42–51
6. Ainsworth MDS. 1. Patterns of infant-mother attachment: antecedents and effects on development. Bulletin of New York Academy of Medicine. 61:771–791
7. American Academy of Pediatrics, Task Force on Infant Positioning and SIDS. Does Bed Sharing Affect the Risk of SIDS? (RE9725) *Pediatrics*. 1997;100:272

In Reply.—

Dr. Servan-Schreiber chooses to focus on one suffocation pattern, overlaying, as the basis for our recommendations, and selectively focuses on "discouraging bed-sharing," as if it were our only conclusion.

In fact, it was "wedging between the bed and a wall" as the leading circumstance of death that led us to discourage the use of an adult bed for an infant, regardless of whether the infant is alone or with another individual. Our conclusions state that "...beds involved were more likely to become hazardous because of their location near a wall, the presence of pillows or soft bedding or because of bed-sharing."

Furthermore, we recommend a regulation to forbid the use of a bed for an infant or toddler only for daycare settings. We believe this is an appropriate recommendation because daycare providers may not always be aware of hazards associated with sleeping, and because their motivation for using a bed instead of a crib is probably for convenience rather than for bonding, feeding, or reducing the risk of SIDS.

We did not address the benefits of co-sleeping because it was never our intent to do anything but better understand the circumstances surrounding infant suffocation deaths.

DOROTHY A. DRAGO, MA, MPH
Product Safety Consultant
Gaithersburg, MD