

Mother-infant co-sleeping with breastfeeding is the context within which infant sleep evolved.^{1, 2} When practiced with safety in mind, this inherently safe "adaptive complex" is as potentially important to optimal psychosocial development and the well-being of contemporary infants and parents as it was to families in prehistoric times.^{3, 4} Is it really any wonder then, that even in the face of aggressive opposition from politically well-placed medical authorities and an over-reaching governmental agency, the U.S. Consumer Product Safety Commission (CPSC),^{5, 6, 7} parents are choosing to sleep with their babies in record numbers?^{8, 9, 10}

Health professionals who recommend against any and all forms of co-sleeping underestimate the capacity of parents to understand that the safety of co-sleeping depends on the conditions within which the activity occurs;^{11, 12} they also underestimate parents' ability to respond to specific bedsharing hazards by eliminating them. Thus health professionals feel justified in making sweeping recommendations that no parent should ever share a bed with an infant. In doing so, they fail to support parents' right to make an informed choice.^{11, 12, 13}

Similar to arrangements for traveling with babies in automobiles, co-sleeping behaviors fall along a continuum ranging from risky to beneficial and protective. A situation in which a non-smoking, breastfeeding mother sleeps with her baby on a stiff mattress with all known adverse factors eliminated is remarkably different from one in which a young, possibly obese, non-breastfeeding, smoking mother regularly sleeps with her baby on a recliner, sofa, or soft mattress, or one in which the co-sleeping baby is positioned prone, on a pillow, next to a toddler, or next to an adult who is drunk, drug-desensitized, or does not know the infant is in the bed. The CPSC and other medical authorities have chosen not to make such distinctions in their own studies of bedsharing and subsequent inferences about its safety, but it is clear that other scientists and parents do.^{11, 12, 13}

Recent scientific studies show that breastfeeding makes co-sleeping more likely, even when parents did not originally intend to co-sleep.^{8, 9, 10, 13, 14} Bedsharing precipitates a cascade of related behavioral and physiological benefits for infants and mothers, and breastfeeding bedsharing mothers exhibit different characteristics than non-breastfeeding bedsharing mothers.¹⁴ For example, compared with breastfed infants who routinely sleep alone, bedsharing infants receive twice as many breastfeeds.^{15, 16} Bedsharing infants spend more time in light sleep, rather than deep, sleep stages,¹⁷ and the number and average duration of prolonged apneas which occur during the deepest stages of sleep are reduced. These deepest sleep stages are the ones in which it is the most difficult for infants to arouse and terminate life-threatening apneas.¹⁸ The number of small arousals is also increased during bedsharing, potentially permitting infants to practice awakening to oxygenate.¹⁹

Bedsharing among breastfeeding mother-infant dyads makes infants and mothers more sensitive to each other's cues, i.e., their arousals are more synchronized compared

with mothers and infants who routinely sleep separately.^{19, 20} Routinely bedsharing mothers tuck their bodies up and lean toward their babies to face them in ways that make overlaying of their infants difficult.²¹ Moreover, our findings show that during bedsharing both mothers and infants spend more time asleep and infants cry less, suggesting that infants and mothers enjoy being close to each other.

Breastfeeding acts as a "hidden behavioral and physiological regulator"¹⁵ of a baby's sleep location, and the subsequent maternal contact *per se* is known to influence the infant's breathing, growth rate, heart rate, arousals, body temperature, and the timing and duration of different sleep stages (Stage 1-4 and REM). Some of these factors may be important in

reducing the infant's chances of dying from SIDS.²²⁻²⁹ In that regard, consider that the recommended safest sleeping position for the human infant, the supine or back position, evolved in the context of mother-infant co-sleeping, to make breastfeeding and both infant and maternal protective interventions possible.²¹ A face-down prone sleeping infant cannot easily, if at all, access or latch on to the breast, nor can that infant get rid of a blanket over his face. Perhaps all of this explains why a recent Global Task Force on SIDS found that, contrary to popular thinking, SIDS is either unknown or the rates are the lowest in the world in cultures within which co-sleeping is the norm.^{30, 31}

It should be noted that the recommendation to place babies prone to sleep was made during an era in which breastfeeding and co-sleeping were at an all-time low in the Western world. The uniquely Western disarticulation of the three essential components of normal infant sleep—the supine sleep position, breastfeeding, and sleep location next to mother—led to the conditions within which tens of thousands of SIDS deaths tragically occurred worldwide.

According to recent surveys from the National Institutes of Child Health and Human Development (NICHD), SIDS rates are declining to unprecedented levels, especially among U. S. sub-groups (middle class whites) in which the biggest increases in both breastfeeding and bedsharing have occurred. It is no coincidence that this drop in the SIDS rate has occurred even as we rediscover the benefits and advantages of breastfeeding^{29, 38, 39} and acknowledge that breastfeeding is naturally interrelated with supine infant sleep and mother-infant co-sleeping.

But caution is always called for. No sleep environment is risk free. While forms of mother-infant co-sleeping, especially when connected to breastfeeding, are inherently safe, other factors require our attention. The use of diverse furniture, furniture arrangements, bedding, and sleeping conditions, parental motivations, levels of sobriety, safety knowledge, and ages of co-sleepers may all affect outcomes of co-sleeping. If these potential benefits or risks can be accurately assessed and communicated to parents, risky co-sleeping practices can be eliminated.

Bedsharing, especially in economically deprived communities, can be unsafe and can lead to tragedies.^{5, 6, 7, 37} This

□ MOTHER-INFANT CO-SLEEPING WITH BREASTFEEDING: ADAPTIVE BEHAVIORS WORTH FIGHTING FOR

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encourages medical authorities and the media in the United States to present to the public simplistic uniformly negative snapshots of all co-sleeping in the form of "bedsharing." Newspapers, for example, feature ominous headlines such as "One-third of Iowa babies die in bed with parents"—a recent headline for an article published in the *Des Moines Register*. The physician interviewed for the story included in the "bed-sharing" death statistics infants dying while co-sleeping on couches, recliners, and sofas. Not addressed were risky circumstances other than where the babies slept or how and where the other two-thirds of Iowa babies died. Why are the deaths of babies sleeping outside the supervision of a responsible adult not considered "preventable" in the same way that "bedsharing" deaths are assumed to be? Were there also recommendations against the crib and/or solitary sleep environments within which the other two-thirds of Iowa babies died? If not, why not?

The issue of where babies "should" sleep should never be discussed as if families practice only one sleeping arrangement (usually there are several) or as if the question has only one answer. But for the safety of all infants we must begin to demand that medical professionals create educational venues within which parents feel free to exchange opinions and ask about how to create safe sleep environments inclusive of bedsharing. As professionals we need to challenge the media and local medical authorities who automatically label co-sleeping and bedsharing as dangerous, without consideration of the specific factors that make it so.

Of immense importance is realizing that where a baby sleeps is not a medical issue but is relational, and sometimes a matter of economics; the urban poor, for example, among whom most "bedsharing deaths" occur, cannot afford cribs.¹⁷ Still, where babies sleep reflects unique qualities of the parent-infant relationship, including parental feelings, infant sensitivities and needs, feeding methods, and how parents want and need to communicate to their infants and children the way they feel about them.^{8, 9, 10, 32, 33, 34} Ultimately, it is the parents who have the right and responsibility to decide which problems or hazards should be eliminated from their

child's sleeping arrangement; where a child sleeps should not be determined solely (if at all) by a physician, forensic pathologist, SIDS researcher, anthropologist, or child protective services professional. Co-sleeping alongside one's infant is a human right. It is not bad behavior, it is not irresponsible behavior, it is not child endangerment, it does not reflect poor judgment. Indeed, sleeping next to one's baby is as normal and as biologically appropriate as breastfeeding and birth itself.⁴

Social practices, including infant care practices, do not change easily, nor do the assumptions and beliefs underlying the science that supports a given practice. But much has changed since I first had the privilege of addressing the need to "re-think healthy infant sleep" in this publication a decade ago. At that time nobody could have imagined that ten years later 73% of the U.S. population would be breastfeeding⁴⁰ or that over half of American babies would be spending some of the night in bed with their parents. Nobody could have predicted that the SIDS rates would be cut in half or that a child care practice over which parents assert control (infant sleep position) would be found responsible for this reduction.^{35, 36}

Perhaps in the next decade we can eliminate further the erroneous and unfair negative stereotypes of co-sleeping that are perpetuated by well-meaning medical professionals. Mother-infant co-sleeping is a behavior which for all the right reasons refuses to go away.

Dr. James McKenna, with Dr. Sarah Mosko, pioneered the first physiological studies of breastfeeding mothers and infants sleeping together and apart. With funding from NICHD he is presently involved in a multi-site research project one component of which involves studying the nighttime caregiving patterns of "at-risk" teen mothers. McKenna holds the Edmund P. Joyce CSC Chair in Anthropology and directs the Mother-Baby Behavioral Sleep Laboratory at the University of Notre Dame, where he is also chairman of the Anthropology Department.

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□ ABSTRACTS

□ **Pseudoephedrine: Effects on milk production in women and estimation of infant exposure via breast milk** by K. Aljazaf, T. W. Hale, K. F. Ilett et al. *Br J Clin Pharmacol* 2003; 56:18-24.

Pseudoephedrine is an α -adrenoceptor agonist widely used as a sinus decongestant and considered compatible with breastfeeding by the American Academy of Pediatrics. A calculated infant dose of around 5% of the weight-adjusted maternal dose has been reported. Literature is scarce on the effect of pseudoephedrine on lactation; however, a decrease in milk production has been reported anecdotally by lactation consultants. This paper investigates the effects of pseudoephedrine on milk production, blood flow in the breasts, and prolactin secretion. This study also quantifies the infant's exposure to pseudoephedrine through human milk.

Eight lactating women (mean 28 weeks postpartum, range 8 to 76 weeks) were recruited for this single-blind randomized crossover study. They received a single dose of 60 mg pseudoephedrine hydrochloride or placebo on 2 separate days about one week apart. They expressed 5 ml of milk immediately before taking the drug and again at 1, 2, 3, 4, 5, 8, 12, and 24 hours after taking the drug. They also collected 1 ml of foremilk and hindmilk at each feed for fat content analysis.

Serum prolactin was measured by chemiluminescent microparticle immunoassay. Milk fat was determined by creamatocrit. Milk production was determined by weighing the baby before and after each feed. Breast blood flow was measured by ultrasonography. The surface

temperature of each breast was measured with an infrared camera. Plasma and milk pseudoephedrine concentrations were determined by high performance liquid chromatography.

The major finding was a 24% decrease in 24-hour milk production following the pseudoephedrine dose compared to placebo (difference between means = 161 ml/day, 95% CI: 63-259 ml/day; $t=3.9$, $P=0.006$). There was a significant linear relationship with stage of lactation, with the largest decrease at 60-80 weeks.

There were no consistent trends in the change in fat content from foremilk to hindmilk. Blood flow in the breast was unaffected 1-4 hours after pseudoephedrine administration (peak concentrations in milk). Breast surface temperature was similar whether mothers took pseudoephedrine or the placebo. The mean change in prolactin levels (13.5% decrease after pseudoephedrine) did not achieve statistical significance, although the magnitude of the decrease was greater in late lactation (60-80 weeks).

The mean milk to plasma ratio of 3.4 is consistent with previous reports. The mean infant dose from milk (relative to maternal weight-adjusted dose) was calculated to be 4.3% (range 2.2- 6.7%) of the usual maximum recommended daily maternal dose of 240 mg. This level is not high enough to be of concern.

The data suggest that infants in the study were able to successfully remove available milk from their mothers' breasts and that the decrease in milk production was not related to altered feeding behavior. The authors recom-

mend that pseudoephedrine should be used cautiously during lactation because of the significant decrease in milk production even after a single dose of the drug. Studies addressing the feasibility of using pseudoephedrine to suppress excess milk production are in progress.

□ **Initiation of breastfeeding among mothers of very low birth weight infants** by M. M. Smith, M. Durkin, V. J. Hinton et al. *Pediatrics* 2003; 111:1337-42.

This retrospective study analyzed the factors predictive of the initiation of expressed breast milk feedings to very low birth weight (VLBW) infants and the transition to direct breastfeeding by their mothers.

Participants in this study were 361 mother-infant pairs obtained from a follow-up study of 6-8 year old children born between 1991 and 1993 in 5 different hospitals. The infants were each born weighing <1501 g. Maternal demographic and delivery information was collected from postpartum maternal interviews, and infant birth and neonatal data were obtained from obstetric and neonatal charts. Infant feeding information was obtained at follow-up by parental questionnaire. The Peabody Picture Verbal Test was administered to mothers as an estimate of verbal IQ.

Of the 361 mothers, 215 (60%) provided expressed breast milk for their VLBW infants. Less than half of those 215 (43%) went on to directly breastfeed their infants. Only 27% of all mothers reported providing direct breastfeeding to their VLBW infants. Thirty percent