

Recommendations for safe sleeping environments for infants and children



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The factors that influence the sleeping arrangements of infants and children are a combination of parental values, socioeconomic factors and cultural diversity. Physicians should offer counsel on the relative risks of unexpected infant death for children sleeping alone or with their parents. They should do so with an understanding of parental expectations and goals, while also taking into account the need to provide a secure physical and emotional sleeping environment for their children.

The practice of bedsharing is not uncommon in our society and remains the routine sleeping arrangement in most of the world's nonindustrialized cultures (1,2). In traditional societies, babies are kept near their mother. Mothers in nonwestern cultures who traditionally sleep with their children say that they do so to monitor them, keep them safe, facilitate breastfeeding and, simply, be near them. The North American emphasis has traditionally been on having children sleep in their own beds, which is thought to play an important role in the child's ability to learn to separate from the parent and to see himself/herself as an independent individual.

In recent years, following safety alerts from the Consumer Product Safety Commission (CPSC) in the United States (3-5), there have been warnings against putting a baby in an adult bed. These warnings come from a review of death certificates classifying the cause of death as suffocation or asphyxia. The association of these adverse outcomes with bedsharing practices prompted the CPSC in 1999 to recommend that the only safe place for babies to sleep is in a crib that meets current safety standards. As of May 2004, the United Kingdom's Department of Health has also advised against bedsharing, and instead recommended that babies sleep in their own crib in the parent's room for the first six months of life (6).

It is therefore important for physicians to identify those families who will continue to bedshare despite these warnings and provide them with the evidence linking bedsharing with an increased risk of unexpected infant death. This information also needs to be conveyed to organizations that promote bedsharing (eg, for breastfeeding) so that all health care providers follow similar guidelines. The purpose of the present statement is to review the available scientific literature on the safety of various sleeping environments for infants and children, and to provide specific recommendations.

BACKGROUND INFORMATION

Before reviewing the scientific information available on sleeping arrangements for infants and children, the terminology associated with this subject matter needs to be clarified.

Sudden infant death syndrome

Based on a 1989 National Institute of Health consensus statement (7), the scientific definition of sudden infant death syndrome (SIDS) for research purposes is the following:

“The sudden death of an infant under one year of age which remains unexplained after thorough case investigation, including the performance of a complete autopsy, examination of the death scene, and review of the clinical history” (7).

Although not explicitly stated in this definition, it is generally agreed that the death of infants from SIDS takes place during sleep.

Bedsharing and cosleeping

Bedsharing refers to a sleeping arrangement in which the baby shares the same sleeping surface with another person. Cosleeping refers to a sleeping arrangement in which an infant is within arm's reach of his or her mother, but not on the same sleeping surface. Sleeping in the same room (ie, room-sharing), but not in the same bed, is cosleeping.

SIDS versus asphyxia

With the recognition of risk factors for sudden, unexpected death related to the sleeping environment, there has been a tendency by many coroners and medical examiners to attach a diagnosis of suffocation or asphyxia secondary to overlying if the infant was sharing a bed with another person (even if there is no evidence to confirm that overlying did occur) (8,9). Others classify bedsharing deaths as deaths of ‘undetermined cause’, thereby avoiding classifying any bedsharing deaths as SIDS. It is important to point out that the autopsy findings in SIDS and in cases of proven asphyxia are often indistinguishable (10). Much of the debate about the safety of bedsharing and the risk of sudden death arises from these facts. Also, this shift in diagnostic labelling makes the data on infant deaths from the 1980s and early 1990s difficult to compare with those of recent years.

ISSUES IN CHOOSING A SLEEP ENVIRONMENT

Infants

Bedsharing is different from solitary sleeping, especially for young infants, because of the complex auditory, visual, tactile, thermal and olfactory stimuli resulting from the close proximity of the parent. According to the arousal deficiency theory, mother and infant bedsharing promotes infant arousals, which may be protective to infants at risk of SIDS (11,12). While bedsharing, infants have less deep sleep than when they sleep alone (13). The responsiveness of the mother to infant arousals during bedsharing might also be protective (14,15). These hypotheses need to be researched further.

Breastfed infants who share a bed with their mother feed more often and for a longer duration than solitary sleeping infants (16). La Leche League International encourages mothers to relax and breastfeed in bed, even if mother and baby fall asleep together, which can easily occur (17). When bedsharing and breastfeeding occur together, certain benefits can be derived by both mother and infant: mothers enjoy a close night-time relationship with their young child, who might then be more inclined to continue breastfeeding (18,19), and weaning a bedsharing child is not very different from weaning a child who sleeps separately (16).

Recent studies have attempted to estimate the prevalence of infants sleeping in adult beds. While there are no available Canadian data, the results of a survey conducted by the National Infant Sleep Position Study (NISP) (20) demonstrated that bedsharing is increasing in the United States and the proportion of infants sharing an adult bed doubled between 1993 and 2000 (5.5% to 12.8%). The prevalence of bedsharing among African-American children was five times that of white children. This relationship has been reported in other surveys (21-24), which also confirm that bedsharing is more common in Asian and Hispanic households and in families of low socioeconomic status. Furthermore, based on a small, uncontrolled study from the St Louis area (Missouri, USA) (25), the choice made by African-American mothers to bedshare with their infants may be because a safe crib was not available.

Older children

In western culture, for children past the infancy period, bedsharing with parents is sometimes regarded as a consequence of night waking. According to Ferber (26), the movements and arousals of one person during the night stimulate others in the same bed to have more frequent waking and sleep-state changes, so that neither parent nor child sleeps as well. However, it is unclear whether parents take children with sleep problems to bed or if taking children to the parental bed causes sleep problems. In cultures that accept bedsharing (eg, African-American), parents are less likely to describe sleep problems compared with cultures that are less accepting of bedsharing (27).

It is unclear whether early independent sleeping is an essential step in the overall maturation process. According to Sears (28), bedsharing does not encourage dependency. He states that children reach the stage of independence

from their parents when they are ready. It is a parent's responsibility to provide a secure environment that allows a child's independence to develop naturally.

A longitudinal study (29) of bedsharing families followed children from birth to 18 years. Outcome measures at six years of age demonstrated no sleep problems, sexual pathology or other negative consequences from bedsharing in early childhood. This trend was maintained until the children had reached 18 years of age. Despite these results, a commentary on this study pointed out that the widespread practice of bedsharing across cultures and centuries does not in itself warrant its endorsement by the medical community (30).

EVIDENCE-BASED DATA ON THE RISKS OF BEDSHARING

There have been no randomized controlled trials to evaluate sleeping arrangements and the risk of sudden unexpected death. There have been a few well-done case-control studies and there are some case series as well. The case-control studies are very important because these large population-based studies, although conducted in several different countries, came to very similar conclusions concerning unsafe sleeping environments.

Case-control studies

The first case-control study was the New Zealand Cot Death Study (31-34). It was a large multicentre case-control study conducted over three years from 1987 to 1990. It involved 393 infants who died from SIDS and 1592 living matched controls. The Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI) study (35), done in the United Kingdom, was a large, population-based case-control study conducted over three years from 1993 to 1996. It involved 325 infants who died from SIDS and 1300 living matched controls. The Chicago Infant Mortality Study (24) was undertaken between November 1993 and April 1996. It included all 260 infants who died of SIDS during that period in Chicago and 260 living matched controls. The latest study was conducted in the Republic of Ireland between January 1994 and December 1998 (36). A total of 203 SIDS cases and 622 control infants were studied.

In a recent publication, the European Concerted Action on SIDS reported their results from data accumulated from 20 regions of Europe with a total of 745 SIDS cases and 2411 live control subjects recruited between 1992 and 1996 (37). This study has particular relevance since it grouped the data from many centres throughout Europe, including six centres from Eastern Europe, all of which followed the same protocol.

In all of the above studies, the data concerning sleeping environments were obtained through home visits, a detailed questionnaire and a careful review of the circumstances of death. These studies confirmed prone sleeping and exposure to tobacco products during and after pregnancy as potent risk factors for SIDS. They also highlighted several unsafe sleeping environments: soft surface, pillow use, bedsharing other than with parent(s) alone, sofa sharing, and bedsharing associated

with recent parental consumption of alcohol or extreme parental tiredness. In addition, the results of these studies confirm that a recent change in the usual sleeping arrangement of the infant, such as sleeping prone or bedsharing for the first time, presents the highest risk for sudden death.

Case series

The case series studies are less robust because of the lack of a control population. Nakamura et al (5) in 1999 and Scheers et al (38) in 2003 reported similar results. They both derived their data from the CPSC databases. The Nakamura et al study was a retrospective review and analysis of data collected on deaths of children younger than two years of age in standard adult beds, daybeds and waterbeds. Most of these deaths (393 of 515) were attributed to suffocation or strangulation caused by entrapment of the child's head in various structures of the bed. The study by Scheers et al (38) was also a retrospective study. The authors reviewed all accidental suffocation deaths among infants 11 months of age or younger reported to the CPSC from 1980 through 1983 and 1995 through 1998.

Unlike the precise data obtained in case-control studies (ie, through home visits and a thorough questionnaire), the information concerning sleeping environments in the two case series was limited to the short narrative summary included on death certificates. In the cases of perceived faulty bed structures (eg, cribs, railing of adult beds), the information was obtained from a report submitted to the CPSC. Although the number of deaths reported is higher in adult beds than in cribs, for most instances it is unclear if the infant who died in an adult bed was sharing the bed with another person. Scheers et al (38) presented a calculation of the risk of bedsharing based on the use of historical controls taken from an annual survey of randomly selected households of living infants (National Institute of Child Health Development's National Infant Sleep Position Study [39,40]). Because we do not know whether all infants found dead in adult beds were in fact bedsharing, and because the control group is a historical control group, the risk of sudden unexpected death from bedsharing in the study cannot be accurately calculated.

Canadian data

There are no case-control studies or case series describing the available Canadian data. However, preliminary results from a recent case series (41) of all sudden unexpected death in infancy in Quebec between 1991 and 2000 revealed that 18% of the 443 cases of sudden death (81 infants) were in recognized unsafe sleeping environments. The circumstances of death and complete details of the sleeping environment were available for all cases. The most frequently encountered unsafe arrangement was unaccustomed prone sleeping. This was followed, in order of occurrence, by the presence of pillows on the bed and sofa sharing with the infant. In 93% of the instances of unsafe sleeping environment, the sleeping arrangement was new for the infant on the night of death. Fifty-seven infants bedshared with a parent, and of these, 14 were cases of bedsharing in a recognized unsafe environment.

TABLE 1
New grades for recommendations from the Canadian Task Force on Preventive Health Care for specific clinical preventive actions

Level of evidence	Description
I	Evidence obtained from at least one properly randomized trial.
II-1	Evidence obtained from well-designed controlled trial without randomization.
II-2	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one centre or research group.
II-3	Evidence obtained from comparisons between times and places, with or without the intervention. Dramatic results in uncontrolled experiments could also be included in this category.
III	Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.
Grades	
A	There is good evidence to recommend the clinical preventive action.
B	There is fair evidence to recommend the clinical preventive action.
C	The existing evidence is conflicting and does not allow a recommendation for or against use of the clinical preventive action to be made; however, other factors may influence decision-making.
D	There is fair evidence to recommend against the clinical preventive action.
E	There is good evidence to recommend against the clinical preventive action.
I	There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making.

The task force recognizes that in many cases, patient-specific factors must be considered and discussed, such as the value the patient places on the clinical preventive action, its possible positive and negative outcomes, and the context or personal circumstances of the patient (medical and other). In certain circumstances where the evidence is complex, conflicting or insufficient, a more detailed discussion may be required. Data from reference 47

No risk for the Quebec population could be calculated because there was no control group in the study. This Canadian study nevertheless highlighted that unsafe sleeping arrangements, both in cribs and in adult beds, are present in that population in proportions very similar to those of the case-control studies mentioned above.

Summary of the evidence

Based on the results of the case-control studies available, we can list the following evidence-based conclusions (Level II-2, Grade B evidence [Table 1]).

- Sleeping on the back carries the lowest risk of SIDS (42,43).

- Room-sharing lowers the risk of SIDS (24,35,37).
- The risk of SIDS is increased when infants bedshare with mothers who smoke cigarettes (32,35,37).
- Bedsharing with an adult who is extremely fatigued or impaired by alcohol or drugs (legal or illegal) that impair arousal can be hazardous to the infant (31,35,44,45).
- The use of soft bedding, pillows and covers that can cover the head increase the risk of death in all sleeping environments (24,36).
- Sleeping with an infant on a sofa is associated with a particularly high risk of sudden unexpected death in infancy (24,35).
- An infant is more at risk of sudden unexpected death if he/she bedshares with people other than his/her parents or usual caregiver (24).

RECOMMENDATIONS FOR A SAFE SLEEPING ENVIRONMENT

Understanding the family dynamics and the reasons for choosing a particular sleeping environment, in conjunction with the awareness of dangerous bedsharing practices, are all important considerations in offering guidance to parents in their choices for sleeping arrangements. No sleep environment is completely risk-free, but much can be done to educate parents on the provision of safer sleeping environments for their infants. The advice given must be guided by the available evidence-based data, which indicate that when infants sleep in their own crib, they are significantly safer than when they bedshare.

Based on the available scientific evidence, the Canadian Paediatric Society recommends that for the first year of life, the safest place for babies to sleep is in their own crib, and in the parent's room for the first six months. However, the Canadian Paediatric Society also acknowledges that some parents will, nonetheless, choose to share a bed with their child. With these caveats in mind, the following recommendations are proposed with the understanding that no randomized studies can be performed to measure the potential impact of these recommendations for a reduction in the incidence of any sudden unexpected infant death.

- Infants should sleep on their back, in cribs meeting the Canadian Government's safety standards (46). This is the recommended sleeping arrangement for the first year of life, under all circumstances.
- The infant sleep environment must be free of quilts, comforters, bumper pads, pillows and pillow-like items. Dressing infants in sleepers should be considered to eliminate the need for any covers over the baby, other than a thin blanket.
- Parents should also be aware that room-sharing is protective against SIDS and that this type of sleeping arrangement is a safer alternative to bedsharing. This may be particularly appealing to mothers who breastfeed and want their baby to be near them without sharing the same bed surface.

- Effective counselling to prevent maternal smoking should begin at the onset of pregnancy, and ideally, well before that.
 - Mothers who smoke during their pregnancy should be informed that their infant has a greater risk of SIDS. Passive exposure to environmental tobacco smoke is also associated with an increased risk of SIDS.
 - When there is exposure to cigarette smoking, pre- or postnatally, the risk of SIDS is further increased with bedsharing.
- Hospitals should not allow mothers to sleep in the same bed with their newborns in view of the effects of postpartum maternal weakness or fatigue, analgesia or postanesthesia. This policy will also serve to educate parents on safe sleeping practices. However, it must not compromise in any way the maternal-infant interaction necessary for the initiation of successful breastfeeding.
- Parents should not place infants on waterbeds, air mattresses, pillows, soft materials or loose bedding, even for temporary sleeping arrangements (eg, during travel). Car seats and infant seat carriers must not replace the crib as a sleep surface due to the risk of the harness straps causing upper airway obstruction.
- Sleeping with an infant, or letting the infant sleep alone on any type of couch, recliner or cushioned chair is dangerous, placing infants at substantial risk for asphyxia or suffocation. Any makeshift bed is dangerous as well.

CONCLUSIONS

Physicians should maximize their opportunities to offer supportive, yet medically balanced and evidence-based, advice about sleeping arrangements as an integral part of anticipatory guidance in well-baby care. The recommended practice of independent sleeping will likely continue to be the preferred sleeping arrangement for infants in Canada, but a significant proportion of families will still elect to sleep together. The risk of suffocation and entrapment in adult beds or unsafe cribs will need to be addressed for both practices to achieve any reduction in this devastating adverse event.

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The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate.