Infant Sleep, Breastfeeding

Professor Helen Ball, Parent-Infant Sleep Lab, Department of Anthropology, Durham University, UK

"Good babies" and sleep development

"Is s/he a good baby?" is a question commonly posed to new mothers and fathers in the early days of parenthood. Typically the enquirer wants to know whether the baby is "contented" and "sleeps well." Those whose babies are "good" are congratulated. Those whose babies are "troublesome" receive sympathy and tips on how to improve their baby's sleep habits. The management of infant sleep is one of the first areas of parenting in which new mothers and fathers are judged by others. It is not surprising then that infant sleep issues are a source of anxiety and frustration for many parents.

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Sleep is a developmental process, and our sleep patterns change throughout our lifetimes. Babies' sleep patterns mature over the first several years of life, and the sleep architecture of newborns is very different than that of adults. Newborns sleep for 20 or so hours a day, but only for 2–3 hours at a time. During the first year overall sleep duration falls to around 15 hours, and the majority of sleep becomes consolidated during night time as circadian rhythms develop.

Sleep is composed of two main states known as REM (Rapid Eye Movement) and non-REM sleep. A normal sleep cycle progresses though phases of deep and less

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and Bed-Sharing

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deep non-REM sleep to REM sleep (also called active sleep) and back again. In adults this cycle takes around 90 minutes; in newborns it is shorter, around 60 minutes. In non-REM sleep higher order brain functions (the thinking parts of our brain) shut down, while in REM sleep the brain is actively processing information acquired during waking hours. Adults typically drop quickly into non-REM sleep when we fall asleep, our initial sleep cycles comprising mostly deep sleep with little REM. As the night progresses REM sleep begins to take over, with most REM occurring towards the morning. The adult pattern of 15–20% of sleep time being comprised of REM is not achieved until puberty.

Babies' brains grow rapidly throughout the first year of life. The process of forming neural connections happens during sleep, and so REM sleep dominates newborn infant sleep cycles. From birth to three months 40–50% of a baby's sleep time is made up of REM, and when babies fall asleep they spend 20 or so minutes in REM before dropping into non-REM. During REM sleep babies wake easily while non-REM is often thought of as the "floppy baby" stage of sleep when they can be easily moved without waking.

Both pediatric and popular knowledge about babies' sleep maturation and regulation is based upon studies of formula-fed infants sleeping alone.

"Settling" is the term used to describe the phase when a baby begins to fall quickly into deep sleep, and to stay asleep for prolonged periods of time (typically from 12 am to 5am). Settling has been considered a desirable parenting goal for the past 50 years. In the late 1950s sleep researchers reported that 70% of the 160 babies they studied began settling by three months of age. The three-month goal became enshrined in pediatric textbooks and has come to represent the age at which babies *should* be sleeping through the night in the minds of Anglo-American parents and health professionals. In the UK infant night waking is one of the most common reasons for parents consulting a health professional. However this "milestone" for sleeping through the night was established when breastfeeding rates were at their lowest, and solitary infant sleep was the norm.1

Settling cannot be isolated from other aspects of infant development. It is now clear that not only do infants begin to settle at different ages, there are big differences in settling behavior between breastfed infants and those who are fed cows' milk formula. Several research studies have now shown that breastfeeding is associated with a later onset of sleeping through the night, and with more frequent night waking, indicating that the established "norms" for infant sleep do not apply to infants who are breastfed. In fact, in societies where all babies are breastfed, "settling" is an unknown

concept and infant night-waking is expected throughout the first year of life and beyond.

Breastfeeding and sleep

The tension between parents' desires, that their babies' sleep habits should match their own as early as possible, and the physiological characteristics of breastfed infants to wake and feed frequently throughout day and night, is known to be an impediment to breastfeeding in Western societies. Research studies exploring barriers to breastfeeding have reported that one issue mentioned by parents was their need for a satisfied baby that sleeps through the night and does not feed too frequently. Parents often seem unprepared to discover that breastfed infants need to feed frequently during the night, and sometimes interpret this as a failure of breastmilk to satisfy the baby—leading to early weaning.

Breastfed babies do wake and feed more frequently at night than those fed artificial formula, and this is the physiological norm for human infants. Newborns have tiny stomachs (the size of a cherry), and breastmilk is quickly digested. Night-feeding allows the baby to obtain sufficient nutrition (up to one third of daily calories). Babies generally double their birth weight by about six months of age, and their brains grow very rapidly, both of which require a large intake of calories. As breastmilk is high in sugar, it provides easily mobilized calories for brain growth, but it is digested in about 90 minutes. Babies therefore feel hungry again after two to three hours.

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Experienced breastfeeding mothers are aware that minimizing the disruption of nighttime breastfeeding is important in sustaining the breastfeeding relationship over many months. One way to accomplish this is for mother and baby to sleep together, allowing the infant easy access to the mother's breasts, and causing minimal sleep disturbance for the mother when her baby needs to nurse. Numerous research studies in the past decade have shown a very strong and clear relationship between breastfeeding and bed-sharing.1 The relationship is an obvious one—and many mothers report that they generally do not notice feeding their babies in the night. Observations of sleep-sharing breastfeeding infants show that they nurse more frequently, and for longer periods than breastfeeding infants who do not sleep next to their mothers, but nonetheless routinely bed-sharing mothers obtain as much or more sleep as those who sleep apart from their breastfed babies.

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Concerns about bed-sharing

The question of whether or not to bed-share concerns many parents. On the one hand it facilitates breastfeeding, which is good for both mother's and baby's health. On the other hand parents are fearful of accidental smothering and Sudden Infant Death Syndrome (SIDS) when the baby is in their bed. The advice new parents receive about bed-sharing can appear contradictory. Advocates on both sides of the discussion have the interests of parents and babies at heart, but the apparently competing messages result in confusion and anxiety, which is not helped by media reports that present study results incorrectly or out of context.

Mothers who discover the ease with which they can nurse at night when bed-sharing report that they continue breastfeeding for a much longer duration than they would have done otherwise. While around 50% of UK babies have slept with their parents at some point by the time they are three months old, over 70% of breastfed babies have done so, compared with a third of babies who are not breastfed.

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Concerns regarding SIDS and/or accidental death have led some authorities (for example, coroners and pathologists) to label parent-baby bed-sharing as a questionable practice that should be abandoned by parents and discouraged by health professionals. These recommendations acknowledge little or no value in mother–infant sleep contact, and do not take the benefits of bed-sharing into account. This view is reinforced by the results of large population-based studies that calculate the likelihood of SIDS or accidental infant deaths, based on the characteristics of babies who have died compared with matched controls. According to these types of study putting a baby down to sleep in the prone (tummy-down) position, placing a baby to sleep in a separate room, parental smoking, and infant head covering during sleep are all behaviors that increased the risk of unexpected infant death. As a consequence, advice on reducing the risk of SIDS in the UK and many other nations emphasizes the importance of placing babies on their backs to sleep, keeping babies in the parents' room for the first six months, not smoking during pregnancy or in the vicinity of a baby, and avoiding loose bedding by employing the "feet-to-foot" position in a cot/crib. These are all relatively simple messages with little conflicting evidence.

The picture is much more complicated in the case of bed-sharing; the estimates of the risk of SIDS for bed-sharing babies vary widely and depend on the circumstances under which bed-sharing is practiced. They also depend on how each research study defined what "bed-sharing" entailed. Some studies include sofa-sharing—and at least one included as "bed-sharing" deaths those that occurred after an infant had been returned to a cot/crib. These different definitions mean that we cannot simply accept at face value the authors' (or media's) headline conclusions. Data on SIDS-risk for bed-sharing babies in England range from no increased risk for babies who sleep with non-smoking parents to a 12-fold increase for infants sharing a sofa for sleep with a parent who smokes.2 The most recent study on bed-sharing and SIDS in the UK found that babies who died while sleeping with a parent were doing so in a hazardous environment, particularly on a sofa, or with a parent who had consumed alcohol or drugs.3 The authors of this paper note that simplistic advice to avoid bed-sharing may actually cause harm, commenting "Parents of young infants need to feed them during the night, sometimes several times, and if we demonise the parents' bed we may be in danger of the sofa being chosen. A better approach may be to warn parents of the specific circumstances that put infants at risk."3

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None of the SIDS studies published so far provides data on the risk of SIDS for bed-sharing babies by feeding type. Until more appropriate data are collected it is impossible to know whether breastfeeding–related bed-sharing constitutes a risk to babies. However, it is unlikely that any potential risk would be of great magnitude given that breastfeeding generally reduces the risk of SIDS compared to formula-feeding according to several studies. One recent systematic review of all the published studies considering the evidence relating to harms and benefits of bed-sharing concluded that evidence on the benefits of bed-sharing to breastfeeding are clear, while the evidence regarding the risks is ambiguous.4

Avoiding dangerous situations

The sleep behavior of breastfeeding bed-sharing mothers and babies shows certain key characteristics. Dyads who regularly sleep together in order to breastfeed at night sleep in close proximity, face one another for most of the night, and have synchronized sleep cycles (with some evidence that mothers' sleep cycles reduce from 90 to 60 minutes to match those of their infants). Breastfeeding mothers and babies have been studied sleeping in narrow hospital beds, full-size beds in sleep labs, and at home in beds ranging from single to king-size. Under all circumstances mothers sleep on their side, facing, and curled up around their baby. Babies, positioned level with their mother's breasts, sleep in the space created between her arm (positioned above her baby's head, on or under

the mother's pillow) and her knees (drawn up under her baby's feet). The consistency across several studies suggests that this very distinctive way of bed-sharing is an instinctive behavior on the part of a breastfeeding mother to protect her baby during sleep. When breastfeeding mothers sleep with their babies in this way they construct a space in which the baby can sleep constrained by their mother's body and protected from potentially dangerous environmental factors such as duvets and pillows, or other bed-partners.4

families videoed sleeping at home, formula-fed infants were generally placed high in the bed, level with their parents' faces, and positioned between or on top of their parents' pillows. In contrast, breastfed babies were always positioned flat on the mattress, below pillow height. Mothers who did not breastfeed spent significantly less time facing their baby than did breastfeeding mother-baby pairs, they did not adopt the "protective" sleep position with the same consistency, and they experienced less sleep synchrony. Fathers' sleep behavior while bed-sharing was hugely variable. Some fathers were very "in-tune" with their infants and adopted similar bed-sharing styles to mothers while others turned away from the mother-baby dyad and slept oblivious to all nocturnal interactions.

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Bed-sharing babies of breastfeeding mothers appear, then, to avoid the presumed hazards of sleeping in adult beds (for example suffocation, overlaying, and entrapment) due to the presence and behavior of their mothers. But this may not be the case for babies who are not breastfed. When we have compared

The hormonal feedback cycle experienced by breastfeeding mothers promotes close contact with, heightened responsiveness toward and bonding with infants in a way that is absent or diminished among mothers who do not breastfeed. The implication for bed-sharing—that breastfeeding mothers and babies sleep together in significantly different ways than do non-breastfeeding mothers and babies—suggests that future case-control studies of bed-sharing must take feeding type into account. It is also important for breastfeeding mothers to be aware that the consumption of alcohol or drugs (including certain prescription and over-the-counter medications) can severely inhibit their normal responses and behavior when sleeping with their infants, and should always be avoided.

The most important issues to remember when sleeping with your breastfed baby are:

- Never sleep with your baby on a sofa or armchair/recliner.
- Never sleep with your baby after drinking alcohol.
- Never sleep with your baby after consuming (legal or illegal) drugs or any medication (such as nighttime cold remedies) that affect your awareness during sleep.
- Be aware that bed-sharing with a parent who smokes (or a mother who smoked during pregnancy) increases the risk of SIDS.
- Think about your bed and bedding with infant safety in mind (avoid gaps, soft surfaces, keep babies away from pillows, do not swaddle or over-wrap a bed-sharing baby).
- Make sure bed-partners are aware the baby is in the bed, and do not allow small children to sleep next to a baby.

Where to find helpful information

Parents need information with which to make informed decisions, and should weigh any potential risks and benefits of bed-sharing in light of their own individual circumstances (WHO, WHERE, HOW & WHAT). Useful sources of information include:

- La Leche League GB Information *Sheet Safe Sleep and the Breastfed Baby* www.llgbbooks.co.uk/shopping/go_shopping/booklets_and_information_sheets/single_information_sheets/safe_sleep_and_the_breastfed_baby_information_sheet/
- UNICEF Baby Friendly Initiative leaflet *Sharing a Bed With Your Baby* www.babyfriendly.org.uk/pdfs/sharingbedleaflet.pdf
- National Childbirth Trust. Position Statement: Co-sleeping and bed-sharing. www.nct.org.uk/press-office/position-statements/transitionparenthood
- Royal College of Midwives. Bed-sharing and Co-sleeping: Position Statement No. 8. www.rcm.org.uk/professional/docs/PS%208%20Bed%20sharing.doc
- American Academy of Breastfeeding Medicine Guideline on Co-sleeping and Breastfeeding www.bfmed.org/Resources/Download.aspx?filename=Protocol_6.pdf
- La Leche League International http://www.llli.org/NB/NBsleep.html

References

1. Ball, H. & Klingaman, K. Breastfeeding and Mother-infant sleep proximity: implications for infant care. Evolutionary Medicine and Health: New Perspectives Eds. Trevathan, W., Smith, E., McKenna, J. New York: OUP, 2008.

2. Blair, P., Fleming, P. et al. Babies sleeping with parents: case-control study of factors influencing the risk of the sudden infant death syndrome. British Medical Journal 1999; 319: 1457–1461.

3. Blair P., Sidebotham, P. et al. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. British Medical Journal 2009; 339:b3666 doi: 10.1136/bmj.b3666.

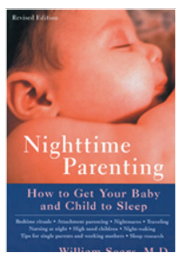
4. Horsley T, Clifford, T. et al. Benefits and harms associated with the practice of bed sharing. Archives of Pedatric and Adolescent Medicine 2007; 161: 237–245.

Helen Ball *is Professor of Anthropology at Durham University, where she is Director of the Parent-Infant Sleep Lab and a Fellow of the Wolfson Research Institute. Together with her team of ten Postdoctoral and PhD students Helen has been conducting studies of parent-infant sleep in the lab, the community and in local hospitals for the past 15 years. She is a member of LLL Panel of Professional Advisors, the NCT Research Advisory Board and the Advisory Board of Attachment Parenting EU. More information about Helen's research projects, publications, and upcoming presentations can be found at www.dur.ac.uk/sleep.lab*

Helen shared a link to this cartoon about nighttime breastfeeding:

http://www.thefoodoflove.org/breastfeed-in-your-sleep.htm

Nighttime Parenting: How to Get Your Baby and Child to Sleep



Dr. William Sears urges parents to have confidence in their own intuition and be responsive to their babies and young children at night.

http://store.llli.org/public/product/92