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This ‘Insight into practice’ explores the current state of guidance regarding SIDS and co-sleeping/bed-sharing in the UK and US (co-sleeping and bed-sharing have been used interchangeably to describe an infant and one or more parents/adults/others sharing a sleep surface, with some variations as discussed below). The goal is to help lactation professionals and allied staff become aware of the larger contextual picture on this topic, and to encourage reflection on how we educate new parents around infant sleep location. There is no doubt that the issue of babies sleeping with their parents has been a polarizing topic; previously I have likened it to a tug of war between different theoretical and ideological perspectives, with health professionals and parents caught in the middle of an academic debate about contradictory evidence and appropriate advice. But over the past 2-3 years the nature and content of discussions on this topic have begun to shift, and agreements are emerging. As will be discussed later, the ‘tug of war’ is no longer an appropriate metaphor to represent the clarifying picture of bed-sharing and co-sleeping. The literature cited here includes examples of key (well known) papers in the chronology of the debate about SIDS and sleep location; and papers providing specific evidence supporting a point.

The bed-sharing / co-sleeping debate ignited in the nineties during a period of intense research and public health activity around unexplained infant deaths that occurred during sleep, and peaked during the 3rd month of life (SIDS or Sudden Infant Death Syndrome). Epidemiological studies conducted in the eighties had identified that infant sleep position was strongly linked with SIDS (Gilbert, Salanti, Harden, & See 2005) and high profile ‘risk reduction’ campaigns in many countries informed parents to sleep babies on their backs. Why the supine sleep position was protective was unclear (and still is), but central apnea (involving sudden cessation of breathing) was a key hypothesis at the time. SIDS rates were high in many Western countries, and as well as sleeping prone most babies slept in cribs in a separate room from their parents.

Researchers exploring night-time infant care from an evolutionary perspective proposed that, as solitary sleeping was not the evolutionary norm for human infants, close mother-infant sleep proximity (co-sleeping, initially defined as mother and baby sharing a bed) might reduce sudden and unexplainable infant deaths (SIDS) by promoting maternal-infant micro-arousals throughout the night and preventing central apneas (McKenna 1986). They noted that infants undergo dramatic changes in their breathing control around 3 months of age, making them particularly vulnerable to unpredictable breathing cessation (McKenna & Mosko 1990). Although an NIH-funded study of breastfeeding co-sleeping mothers and babies supported the hypothesis that sleep contact promoted regular night-time interaction and lighter stages of sleep, this study was not designed to assess SIDS outcomes (Mosko, Richard, & McKenna 1997).

As the co-sleeping hypothesis gained traction, epidemiologists examining bed-sharing found it was associated with more rather than fewer SIDS cases (Mitchell & Scragg 1993). Initial epidemiological data were fairly unsophisticated: definitions of ‘bed-sharing deaths’ varied widely between studies, encompassing sofa-sharing, sleep-sharing with siblings or pets, and sleeping with a parent for some portion of the night, but discovered dead in a crib (Cote 2006). Control families’ reports of ‘bed-sharing’ ranged from ‘usual behavior’, to sleep location on a particular night (or part thereof), to ever sharing a sleep surface. Data were not comparable between studies, or even between cases and controls in the same study (Ball, Hooker, & Kelly 1999).

Although no case-control evidence supported the hypothesis that co-sleeping prevented SIDS, it became clear that babies room-sharing with their parents were less likely to die (Scragg et al., 1996). ‘Co-sleeping’ was redefined to encompass room-sharing (McKenna & Mosko, 2001), while ‘bed-sharing’ was applied to all shared sleep surfaces (bed, sofas, armchairs, and makeshift arrangements). As a general category bed-sharing

appeared to be a dangerous activity, with more babies dying in ‘bed-sharing’ scenarios and fewer control babies apparently sleeping in them. Strict guidance was introduced to dissuade parents from bed-sharing in many countries, including the US and UK, and ‘Never Bed-share’ campaigns became prominent for a decade or more, employing ever-increasing shock-tactics (Bartick, 2014).

As research progressed the relationship between sleep location and SIDS was revealed to be more complex than assumed by those promoting a simple behaviour change approach (Ball & Volpe, 2013, Fetherston & Leach, 2012). A strong relationship between bed-sharing and breastfeeding was demonstrated in multiple studies, suggesting that the ‘Never Bed-share’ message may not only hinder maternal and child health promotion by impeding breastfeeding (Ball, 2003, Smith et al., 2016), but also SIDS reduction itself, as formula-use is associated with increased SIDS (Hauck et al 2011). It also became clear that although bed-sharing is associated with particular cultural contexts and socio-ecological circumstances (Luijk & Mileva-Sietz, 2013, Salm Ward & Doering, 2014) SIDS rates were particularly low in some of these settings (Ball et al., 2012). Bed-sharing on its own did not substantially increase the risk of SIDS, but bed-sharing in conjunction with some other hazardous circumstance—smoking, alcohol consumption, drug use, and ad-hoc sleeping arrangements such as sofa-sharing were increasingly implicated (Blair, Sidebotham, Pease, & Fleming, 2014).

An Indian parable tells of a group of blind men who were taken to meet an elephant. In order to assess its size and shape each blind man felt the nearest piece of the animal. One touching the trunk declared it resembled a snake, one feeling a leg that it resembled a tree, one at its side perceived an elephant as a wall, and one holding the tail imagined a rope. All of the elephant-feelers were correct, but their perception was limited to a small piece of evidence. In order to conceptualize the whole elephant the men needed to pool information

from their individual vantage points. The blind men's elephant works as a metaphor for understanding bed-sharing: the evidence is clear--bed-sharing is associated with infant deaths, both SIDS and accidental; and with breastfeeding; it is a valued cultural infant care practice, associated with SIDS in some bed-sharing cultural groups, and not in others. For an accurate assessment all the parts of the picture must be brought together in context.

On both sides of the Atlantic those producing recommendations are beginning to acknowledge the whole elephant.

Following a media furore around an overly-hyped SIDS publication in 2013, the UK Government instructed the National Institute for Health and Care Excellence (NICE) to review the guidance on SIDS and bed-sharing /co-sleeping. New recommendations on SIDS and co-sleeping were published in December 2014 as an addendum to the Clinical Guidance on postnatal care (CG37: <https://www.nice.org.uk/guidance/cg37/evidence/full-guideline-addendum-485782238>).

The process conducted by NICE involved a) registration of stakeholders who wished to comment on draft guidance, b) a meeting of NICE standing committee B (comprising clinicians and methodological experts from many specialties) with invited topic-specific members, to define the scope of the review, c) agreement that NICE statisticians would conduct a systematic evaluation of available evidence, d) a meeting of Standing Committee B to receive the report from the statisticians and produce a draft recommendation, e) electronic consultation on the draft recommendation with all stakeholders, f) a third standing committee meeting to consider the consultation feedback and make amendments to the draft, g) publication of the final recommendation, h) endorsement of resources to support implementation, i) archiving of all meeting minutes, stakeholder feedback, and evidence review details on the NICE website for open access (<https://www.nice.org.uk/guidance/cg37/history>). The NICE statisticians assessed the

strengths and weaknesses of all case-control studies directly examining the relationship between SIDS and co-sleeping (defined by NICE as parent and infant sleeping together on a bed, sofa or armchair). Their rigorous evaluation of the 12 studies and 2 individual patient data analyses highlighted problems affecting the rigor of most studies as discussed above (NICE CG37 Addendum 2.1.2). Although an association between SIDS and co-sleeping was detected when all co-sleeping environments were considered as a whole, the evidence that co-sleeping was causally linked to Sudden Infant Death Syndrome was not compelling (NICE CG37 Addendum 2.1.5). Despite some recent evidence that co-sleeping on sofas is particularly hazardous (Blair et al, 2014, Rechtman, Colvin, Blair, & Moon, 2014;) a lack of studies with sufficiently detailed data at the time of the review prohibited separate recommendations about bed versus sofa co-sleeping (NICE CG37 Addendum 2.1.3.1).

[Insert Table 1 Here]

The new guidance recommends that parents should be informed, during antenatal and postnatal contacts, of the statistical association between co-sleeping and SIDS, but does not advise parents to never sleep with their babies (see Table 1). The key message is that health professionals must give parents balanced information to help them make informed decisions about where their babies sleep (NICE Press Release 2014). Those parents who need the most careful guidance are those who smoke or did so during pregnancy as the association with SIDS is strongest in this group (NICE CG37 Recommendation 1.4.47). Evidence also suggests a potential association between SIDS and co-sleeping for babies born prematurely, with low birth weight, or with parents who co-sleep after consuming alcohol or drugs, so these situations also warrant special attention (NICE CG37: Recommendations 1.4.48 and 1.4.49). To support health professionals who provide antenatal and postnatal infant care information to parents, NICE also evaluated and endorsed a selection of resources for use in implementing this guidance (NICE Postnatal Care--Tools & Resources, 2014).

These guidelines did not differentiate between breastfeeding and non-breastfeeding babies with regards to SIDS and co-sleeping—a feature of much panel discussion, as well as many stakeholder comments received during the consultation (NICE GC37.1 Stakeholder Comments). The statisticians felt there were insufficient data examining this relationship for justify a specific recommendation (NICE CG37.1, section 2.1.3.4). The guidance update was also restricted to SIDS only, and did not cover accidental infant deaths.

This UK guidance is quite different to that recently issued in the US by the American Academy of Pediatrics (2016) in their updated recommendations on infant safe sleeping environments. Fewer details are available on the process by which AAP recommendations were generated, but the published ‘technical report’ indicates a) the members of the SIDS Task Force conducted a PubMed review of relevant studies since 2011 (the date of the previous update), b) members of the Task Force evaluated the studies, selecting those of ‘sufficient quality’ for inclusion (no quality criteria are given), c) the opinion of a biostatistician with expertise in perinatal epidemiology was consulted regarding 2 re-analyses of previous case-control studies on bed-sharing and SIDS, d) the strength of evidence for recommendations was determined by the Task Force members, e) drafts of the policy statement and technical report were reviewed by AAP sections and committees, f) appropriate revisions were made and a final version submitted to the AAP executive committee for approval (Moon et al 2016). The updated guidance is intended for ‘all who care for infants’ and encourages health care practitioners “to have open and nonjudgmental conversations with families about their sleep practices.”

[Insert Table 2 Here]

Although there is much overlap in content, one key difference is that the US recommendations position healthcare professionals in the role of advisors, while the UK recommendations position them as educators, providing information to ‘empower parents to

make informed choices' (NICE press release 12.2014). This indicates a shift in thinking regarding infant death prevention in the UK that has not (yet) taken place in the US. Beattie's Health Promotion Model (Beattie, 1991) describes how health promotion happens in 'authoritative' and 'negotiated' ways, at individual or community levels. The successful safer infant sleep interventions implemented 20 or so years ago, such as 'Back to Sleep' followed the Authoritative/Individual pattern with the issuance of Safe Sleep 'rules' to be implemented by individual families. However implementing this model was not successful in persuading parents to cease bed-sharing. As a consequence UK guidance is now pursuing a negotiated approach aimed at 'risk minimization' via parental education about the hazardous sleep circumstances they might want to avoid. On the other hand, although the US guidance now acknowledges how bed-sharing might happen, it retains an authoritative stance, emphasizing 'risk elimination' due to the perceived dangers of bed-sharing.

In the UK 700,000 births and 215 SIDS deaths (**sudden unexplained and unascertained infant deaths only**) occur per year, approximately half of these occurring alone in a crib, and half while co-sleeping. Ninety percent of the latter take place in hazardous co-sleeping scenarios, so the UK approach targets the limited resources for promoting safer infant sleep funding to where it might prove most effective. In the US with almost 4,000,000 births and 3500 sleep-related infant deaths (**sudden unexplained, unascertained, and accidental infant deaths**) per year changes in guidance occur more slowly, and caution is understandable with substantially more infant deaths and a far larger population to consider. Within states and local regions, however, alternate approaches may be worth exploring, **drawing on the recent trend for 'patient-centered' or 'family-centered care'**. In attempting to effectively tackle avoidable infant deaths the UK has embarked along a new path that the US might choose to explore.

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