

Bedding and mattresses - the research



Early research in 1968 identified soft mattresses and pillows as potential risk factors for sudden infant death syndrome (SIDS), raising concerns about the role of surface firmness in infant safety¹. Subsequent studies broadened this focus, examining how loose bedding contributes to suffocation risk and its association with unexplained infant deaths². Over time,

theories regarding bedding have expanded further to include the effects of thermal stress, with particular attention to the dangers of overheating as a contributing mechanism³.

Pillows, quilts and other loose items in the bed increase the risk of SIDS. Pillow use when the infant is not bed-sharing has been found to increase the risk of SIDS by 3- 7 times in studies in the USA and Germany⁴⁻⁶. Research from across Europe and the USA has shown that loose items or coverings in the bed, which leads to an infant having their face or head covered by bedding, carried a 3-16 times risk of SIDS⁵⁻⁷. One study of Scottish infants found that those who had previously been discovered with their heads covered by loose bedding had approximately twice the risk of SIDS compared with infants who had not⁸.

Duvet use specifically increases the risk of SIDS between two and four-fold^{6,7,9,10}. Similarly, sheepskin bedding, a form of loose bedding used in New Zealand, was found to have a two-fold associated risk of SIDS in infants not bed sharing with an adult¹¹. Consistent with theories regarding thermal stress and SIDS, a German study reported that using a thick duvet posed slightly greater risk than a lighter duvet, and that both were associated with significantly higher risk compared to using a light cotton sheet or a fitted sleeping bag¹⁰. Tog recommendations were made in one study¹² but have not been subsequently tested.

Bed mattress firmness has also been found to be an independent risk factor for SIDS. An infant sleeping on a soft surface has been found to have between a two and five fold increased risk of SIDS, than case matched controls, from studies in the USA, New Zealand and Europe. Concern has also been raised about the softness of adult beds, in which a baby is co-sleeping, and that this may be a layered risk of SIDS¹³. There have been no reported or speculated advantages of soft mattresses, and so it is recommended that an infant sleeps on a firm mattress.

Interestingly, one study of Scottish infants showed a 2.5-fold increased risk of SIDS in babies sleeping, but not co-sleeping, on mattresses which are not fully made of polyvinyl chloride (waterproofing) and had previously been used by another infant or adult⁸. There was no increase in risk found in this study of an infant sleeping on a previously used polyvinyl chloride mattress. This led to further investigations on mattress materials; bacteria can remain present in foam mattresses^{14,15} but no cause-and-effect mechanism from old mattresses were found for SIDS^{16,17}.

References

1. Emery, J. L. & Thornton, J. A. Effects of obstruction to respiration in infants, with particular reference to mattresses, pillows, and their coverings. *Br. Med. J.* **3**, 209–213 (1968).
2. Kemp, J. S. & Thach, B. T. A Sleep Position–Dependent Mechanism for Infant Death on Sheepskins. *Am. J. Dis. Child.* **147**, 642–646 (1993).
3. Fleming, P. J. *et al.* Interaction between bedding and sleeping position in the sudden infant death syndrome: a population based case-control study. *BMJ* **301**, 85–89 (1990).
4. Fu, L. Y., Moon, R. Y. & Hauck, F. R. Bed Sharing Among Black Infants and Sudden Infant Death Syndrome: Interactions With Other Known Risk Factors. *Acad. Pediatr.* **10**, 376–382 (2010).
5. Kemp, J. S., Livne, M., White, D. K. & Arfken, C. L. Softness and potential to cause rebreathing: Differences in bedding used by infants at high and low risk for sudden infant death syndrome. *J. Pediatr.* **132**, 234–239 (1998).
6. Schlaud, M. *et al.* The German case–control scene investigation study on SIDS: epidemiological approach and main results. *Int. J. Legal Med.* **124**, 19–26 (2010).
7. Carpenter, R. G. *et al.* Sudden unexplained infant death in 20 regions in Europe: case control study. *The Lancet* **363**, 185–191 (2004).
8. Brooke, H., Gibson, A., Tappin, D. & Brown, H. Case-control study of sudden infant death syndrome in Scotland, 1992–5. *BMJ* **314**, 1516 (1997).
9. Ponsonby, A. L., Dwyer, T., Couper, D. & Cochrane, J. Association between use of a quilt and sudden infant death syndrome: case-control study. *BMJ* **316**, 195–196 (1998).
10. Vennemann, M. M. *et al.* Sleep environment risk factors for sudden infant death syndrome: the German Sudden Infant Death Syndrome Study. *Pediatrics* **123**, 1162–1170 (2009).
11. Mitchell, E. A., Thompson, J. M., Ford, R. P. & Taylor, B. J. Sheepskin bedding and the sudden infant death syndrome. New Zealand Cot Death Study Group. *J. Pediatr.* **133**, 701–704 (1998).
12. Wigfield, R. E. *et al.* How much wrapping do babies need at night? *Arch. Dis. Child.* **69**, 181–186 (1993).
13. Flick, L., White, D. K., Vemulapalli, C., Stulac, B. B. & Kemp, J. S. Sleep position and the use of soft bedding during bed sharing among African American infants at increased risk for sudden infant death syndrome. *J. Pediatr.* **138**, 338–343 (2001).
14. Jenkins, R. O. & Sherburn, R. E. Growth and survival of bacteria implicated in sudden infant death syndrome on cot mattress materials. *J. Appl. Microbiol.* **99**, 573–579 (2005).

15. Sherburn, R. E. & Jenkins, R. O. Aerial release of bacteria from cot mattress materials and the sudden infant death syndrome. *J. Appl. Microbiol.* **98**, 293–298 (2005).

16. Mitchell, E. A. Wrapping a cot mattress in plastic does not explain the continuing fall in SIDS mortality. *Eur. J. Pediatr.* **167**, 251–252 (2008).

17. Tappin, D., Brooke, H., Ecob, R. & Gibson, A. Used infant mattresses and sudden infant death syndrome in Scotland: case-control study. *BMJ* **325**, 1007 (2002).

Frequently asked questions

What does the research show?

Research over many decades has shown that loose bedding is linked with higher risk of SIDS. Early studies raised concerns about pillows, and later research found that items such as quilts, duvets, and sheepskins can increase the chance that a baby's head becomes covered or that they become overheated. Across studies in the USA, Europe, and New Zealand, these types of bedding were associated with significantly higher SIDS risk. Firmness of the sleeping surface has also been examined. Multiple studies have found that babies sleeping on soft mattresses face a higher SIDS risk compared to those on firmer surfaces. Some research has found used mattresses, particularly those not fully waterproofed with polyvinyl chloride, may also contribute to increased risk, but further investigation did not identify any cause-and-effect mechanism related to old mattress materials or bacteria.

Do you recommend baby hammocks?

No, we don't recommend baby hammocks. The safest place for a baby to sleep is on their back, on a clear, flat, separate sleep space.

Should I use a waterproof mattress protector on my baby's mattress?

We recommend using a waterproof mattress protector as it means you can keep the mattress clean and dry.

Can you reuse a baby mattress?

If possible, it's best to buy a new mattress for each baby. If you need to use a second-hand baby mattress, it should:

- Have no rips or tears.
- Be in good condition with no water damage.
- Be firm and flat (no areas of sagging).
- Fit the cot or Moses basket well, with no gaps.
- Have a fire-resistant label on it.

Which baby mattress should I buy?

When choosing a baby mattress, ask yourself these three questions:

- Is it firm?
- Is it flat?
- Does it have a waterproof cover?

What safety standards should I look out for?

We strongly recommend that any second-hand product you chose meets the relevant British Safety Standards, especially if you are buying an item online. A British Safety Standard tells us that the product has passed certain safety tests, such as making sure it will not fall apart or easily catch fire. Visit our website for more detail on individual British Safety Standards. Note there is no standard related to SIDS. This means that even if a product meets the relevant British Safety Standards, it won't necessarily be safe when it comes to reducing the risk of SIDS.

What is the key takeaway for families?

Research has shown that loose bedding and soft mattresses increase the risk of SIDS. The safest place for your baby to sleep is on a firm flat surface, with no loose items. It is also important to check the labels of cribs, cots, mattresses, car seats and sleeping bags, to ensure that they meet national safety standards.

