

Infant sleep safety: testing for correct mattress firmness

Some child-care staff are not aware that leaving a baby alone on an overly soft surface is very dangerous. Experts recommend a “firm” sleep surface for babies aged 0-12 months, even babies that are positioned face up (as they should be). Some baby products are unsafe because they are made too soft. On the other hand, some staff are tempted to add extra cushioning to an otherwise safe baby product, in order to ensure the baby's comfort. It is important for staff to understand that adding extra cushioning to a commercial baby product may result in a fatal sleeping accident. It is now recognized that many cases of Sudden Infant Death Syndrome (SIDS) are actually due to asphyxiation (suffocation). ^{[1] [2]}

So a firm mattress is safer than a soft one, but how firm is firm enough, without being rock hard? And how can staff have confidence that they are providing babies with a safe sleep environment?

Three research studies have established the danger of overly soft sleep surfaces. ^{[3] [4] [5]} Another study actually measured the firmness of sleep surfaces for babies that died and babies that survived. ^[6] Still another study invented a way that staff can test sleep surfaces to confirm whether the sleep surfaces are firm enough. ^[7] A “sleep surface” can be any object or piece of furniture, or any commercial baby product, on which an unsupervised baby might be placed in a horizontal position. This includes cots, prams, strollers, cradles, bassinets, travel cots, infant carriers, cocoons, infant sleep mats, and the like (as well as adult beds).

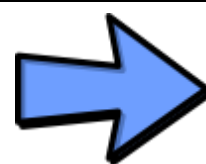
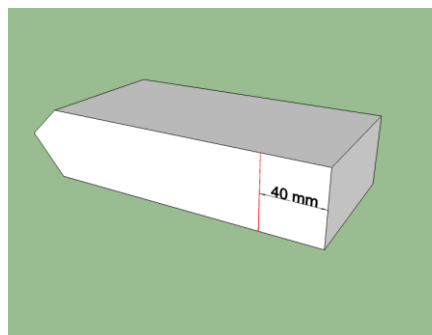
A few common items are required to conduct the firmness safety test: a ruler or tape measure, a pen or waterproof marker, two unopened cartons of milk (or juice) of size one litre, 12 CDs or DVDs, and some kitchen cling wrap. The CDs or DVDs will not be damaged during the test. The required milk (or juice) cartons are approximately 70 mm (2¾ inches) square at the bottom.

This test method will not work for slings and hammocks that support the baby by suspension, or for products that can only hold the baby in an upright position.

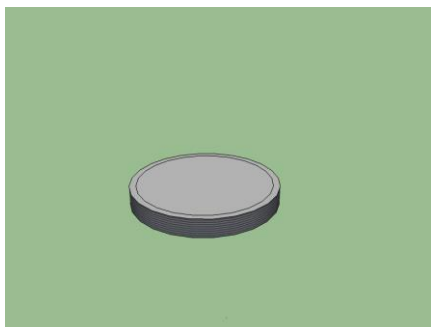
Step 1 is to make a neat stack of the 12 CDs, and to cover the stack tightly in some cling wrap:



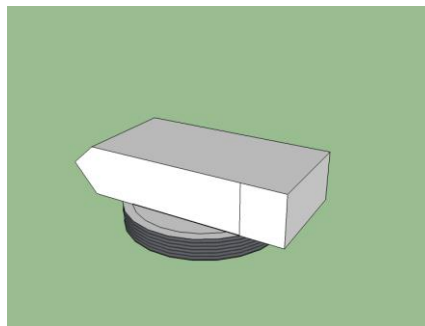
Step 2 is to mark one of the milk cartons with lines on two opposite sides, parallel to the bottom edge and 40 mm (1½ inches) up:



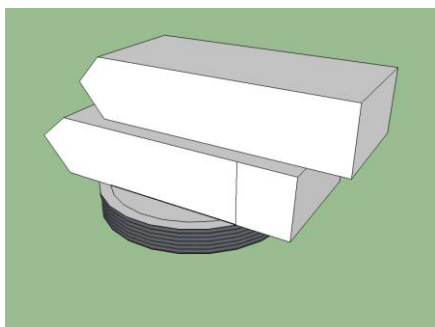
Step 3 is to place the tightly wrapped CDs on the softest part of the sleep surface. The sleep surface should be tested as the baby would use it, with the normal mattress cover and sheets in place:



Step 4 is to lay the milk carton with the two marked lines sideways on the CDs, centered on the top, with the line on each side even with the edge of the top CD. The bottom of the milk carton will thus overhang the edge of the CDs by 40 mm (1½ inches):



Step 5 is to lay the second milk carton sideways on top of the first, selecting a position off-center if necessary to make the stack as *level* as possible:



Finally, **Step 6** is to observe whether the overhang of the lower milk carton comes into any contact at all with the sleep surface. If it does, the sleep surface is *too soft to be safe*.

Here is an example of a sleep surface that is **too soft**:



Here is an example of a sleep surface that is **firm enough**:



References

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2. [Combrinck M, Byard RW. Infant asphyxia, soft mattresses, and the "trough" effect. *Am J Forensic Medicine & Pathology* 2011; 32:213-214.](#)
3. [Ponsonby AL, Dwyer T, Gibbons LE, Cochrane JA, Wang YG. Factors potentiating the risk of sudden infant death syndrome associated with the prone position. *N Engl J Med* 1993; 329:377-382.](#)
4. [Kemp JS, Nelson VE, Thach BT. Physical properties of bedding that may increase risk of sudden infant death syndrome in prone-sleeping infants. *Pediatr Res* 1994; 36:7-11.](#)
5. [Hauck FR, Herman SM, Donovan M, Iyasu S, Merrick Moore C, Donoghue E, Kirschner RH, Willinger M. Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study. *Pediatrics* 2003; 111:1207-1213.](#)
6. [Schlaud M, Dreier M, Debertin AS, Jachau K, Heide S, Giebe B, Spermhake JP, Poets CF, Kleemann WJ. The German case-control scene investigation study on SIDS: epidemiological approach and main results. *Int J Legal Med* 2010; 124:19-26.](#)
7. Somers, RL...*Australia New Zealand Journal of Public Health*, in press