

Baby Sleep

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Humans spend about a third of their lives sleeping, although some people manage on much less. Thomas Edison believed that sleep was a waste of time. However, research shows that sleep deprivation can have serious consequences on memory, concentration, behaviour, mood, judgement and on overall health.

Although the recommended length of adult sleep is 9 hours, the average is 7.75 hours. However, no one sleeps this long without interruption. In any sleep cycle, there will be periods of light and deep sleep followed by active sleep. At the end of active sleep, the sleeper wakes up, but if undisturbed will drift back to sleep again.

Adults have at least five cycles of sleep at night, with each cycle lasting about 90 minutes. Babies follow a similar pattern, but their sleep cycle lasts between 50 and 60 minutes. Generally, the length of the sleep cycle increases with age.

For most parents, the two main problems are falling asleep and staying asleep. Some babies fall asleep easily and stay asleep while others fall asleep easily but wake up frequently. Some babies go to sleep with difficulty, but stay asleep, while others do not want to go to sleep or stay asleep. Babies who were good sleepers at 6 months may develop sleeping difficulties as they grow older and vice versa.

Sleep problems are common in babies but understanding and knowing how to deal with them enables parents to get a better night's sleep for themselves, which in turn enables them to provide loving, patient and consistent care for their baby.

Sleep deprivation

In 1964, Californian high school student Randy Gardner set a new world record by staying awake for eleven days. After two days, Gardner experienced mood swings, concentration and memory loss. By the fourth day, he began hallucinating. Although he appeared to be in good health on the final day, research shows that chronic sleep loss increases the risk of heart disease, obesity, depression and diabetes. Even short-term sleep loss can have serious consequences. Several major industrial accidents and international nuclear disasters, such as Chernobyl and Three Mile Island, have been linked to sleep deprivation.

How much sleep do we need?

Newborn babies typically sleep for 15 to 19 hours over a 24-hour period, waking every 2 to 4 hours for a feed. Six-week-old babies need about 16 hours including naps, and 6-month-old babies, an average of 14 hours with 2 or 3 daytime naps. Pre-school children require 10 to 13 hours of sleep, and school-age children, 9 to 11 hours.



If children do not get enough sleep, they may perform poorly on creative and problem-solving tasks and exhibit behavioural problems. Prolonged sleep deprivation in babies can influence normal brain development resulting in decreased brain mass, nerve cell death and stunted growth.

Baby sleep

Throughout human history, babies have fallen asleep when nursed, held close or worn in a sling or carrier. However, some sleep experts believe that parents should encourage babies to fall asleep independently to avoid night-waking problems. But there is no research evidence to support this theory.

Many parents allow their babies to fall asleep at the breast, in their arms or when they are carried in the belief that it is natural to rock or nurse the baby to sleep. In many parts of the world, this is normal practice. Babies who are kept in close contact with their parents throughout the day typically fall asleep at night while breastfeeding or experiencing skin-to-skin contact. They may also be swaddled and rocked to sleep in their cradles or cribs until they enter the period of deep sleep (see page 5, Principles of Sleep).

Sleep behaviour may be specific to a relationship or setting. The baby may nap at the nursery or *Baby Sensory* class, but not at home (or vice-versa), or fall asleep more easily when the babysitter puts the infant to bed than when the parent does (or vice-versa). How the baby settles down to sleep may also present differentially with mothers and fathers.

Many experts believe that the following extrinsic factors play a role in the emergence of positive sleep behaviours in babies.

- The physical and psychological well-being of the primary caregiver (usually the mother).
- The primary caregiver's own childhood experiences of parenting.
- The baby's temperament.
- The physical health of the baby.
- Parent-baby interactions.
- Environmental influences.
- Bedtime routine.

Research shows that a reduction in parent-infant interactions before bedtime dramatically improves the baby's sleep. A consistent, predictable and regular bedtime routine is also important because the baby learns to associate certain events and situations with bedtime. However, it may take a week or two for the baby to fall into a regular routine.

Factors such as temperature, cigarette smoke, exposure to light (see below), loud or continuous sounds, infection, and changes in the maternal diet (if breastfeeding) can have a negative impact on sleep behaviour. Daytime naps, rest-breaks, fresh air and sunshine, and opportunities to exercise will promote better sleeping patterns at night.



Although a night light can aid night time feeds and nappy changes, it can lead to difficulties in getting to back to sleep. Even if the light (any light) is turned on for a few seconds, the brain suppresses production of the sleep hormone, melatonin.

Exposing babies to sunshine, keeping the house bright during the day, dimming the lights in the evening, and putting the baby to bed in complete darkness at night will help regulate wakefulness and sleep over a 24-hour period.

Bedtime routine

The bedtime routine should be simple, consistent, realistic, and achievable for the parent, and soothing, pleasant, and reassuring for the baby. It doesn't matter what the routine consists of providing the same things happen every night.

It may be difficult to ensure that events happen in a regular sequence in the first 6 weeks, but by 2 months, the baby will associate certain situations with bedtime. By 6 months, the bedtime routine should be well established.

Adjustments to the regular routine can be expected as time goes on. Older active babies for example, are generally ready for bed earlier in the evening than younger, less mobile babies.

Here are a few tips that may help:

- Allow a quiet wind-down period of at least 20 minutes before bedtime.
- Make the bedtime ritual as calm and as relaxed as possible to reduce stress levels.
- Help baby to relax and unwind in a warm bath. When she gets out, the surrounding cooler air will lower her temperature, which will help trigger the sleep mechanism.
- Put baby in special clothes that are only used at night.
- Snuggle quietly with baby or read a story but avoid overstimulating her or she will still be fizzing at bedtime.
- Use key words such as 'Bedtime' or 'Night-night' to help baby associate them with sleep.
- Offer baby a massage but leave a gap of 30 minutes after a feed or bath, and before bedtime.
- Massage baby's feet to stimulate the secretion of melatonin (sleep hormone).

An occasional break in routine is unlikely to cause too much disruption, but regular changes may unsettle the baby.

Signs of tiredness

Look out for signs of tiredness. For example, an intermittent 'Owh' sound means that the baby is sleepy. Other signs include fussing, gaze aversion, unfocused glazed eyes, touching the ears, and yawning.



Tips for promoting sleep

- Let baby have a daytime nap when she needs it, or she may become over-tired, overstimulated and difficult to settle at bedtime.
- Avoid putting baby down on a very full tummy (to avoid increasing core body temperature, which will keep her awake).
- Wind baby fully before bedtime.
- If breastfeeding, avoid alcohol, artificial sweeteners and excess caffeine, which can have a negative effect on baby's ability to sleep.
- Ensure that the room temperature is neither too hot nor too cold and that baby is dressed comfortably. These checks can make all the difference to sleeping.
- Remove cot bumpers and soft toys. They can raise core body temperature and increase the risk of suffocation.
- Make sure that the room is dark and quiet, so she learns the difference between night and day.
- Swaddle baby in a breathable, cotton blanket to remind her of the warmth and comfort of the womb. Do not cover her face or head. Place baby's preferred sucking hand near her face so she can self-soothe when needed. Tuck the other arm in close to her body. Leave her hips and legs free to flex and move.
- Provide a dummy to help baby to soothe herself to sleep.
- Put baby on her back (babies should always sleep on their backs) on a firm surface to keep her spine as flat as possible and to allow her lungs to expand fully.
- Make sure baby's feet are near the end of the cot. This will prevent her from working her way under the covers where she could suffocate.

Some babies whine for a few minutes before settling, but the sound should not make parents feel uncomfortable. It is not unusual for some babies to take 30 minutes to go to sleep. Babies should not be left to cry themselves to sleep for longer than a few minutes. A comforting hand on her head or tummy will provide reassurance and comfort.

Sleep techniques

Desperation often drives parents to try out new methods to get their baby to sleep. The Controlled Crying Method involves tucking her in, saying 'Goodnight' and leaving the room. If baby is still crying ten minutes later, then the parent can check that she is okay, but must not pick her up or talk to her. Some parents feel uncomfortable with the method and stop after the first or second attempt. However, parents who are mentally prepared for the battle are often surprised by the results.

Parent Soothing or the Gradual Retreat Method works on the basis that the parent gradually separates from baby over time. The first stage involves stroking baby or placing a resting hand on her head or tummy until she falls asleep. The next stage involves sitting near the cot while she settles. Over the next few weeks or so, the parent gradually moves away from the cot, until baby goes to sleep by herself.



Whatever the method used, parents must feel comfortable and confident with it. Babies quickly pick up on stress, which can make them agitated and unsettled.

Co-sleeping

The practice of sleeping with baby is common to many cultures, but it also has its critics. Some argue that the baby will find it hard to sleep without the parent or that sleeping with the adult isn't safe.

Although there is an association between co-sleeping and Sudden Infant Death Syndrome (SIDS), evidence suggests that it is not bed-sharing that presents a risk factor, but the circumstances in which it occurs. For example:

- If the baby is premature or of low birth weight.
- Parental incapacity due to alcohol consumption.
- Parental overtiredness or exhaustion.
- Taking drugs or medications in the hours leading up to bed-sharing.
- If one or both parents are smokers.
- If the parent suffers from sleep deprivation.
- Sleeping on a sofa or armchair, with or without the parent. The baby may slip face down into the crevice or get wedged at the back of the chair.
- Leaving the baby in the parental bed alone.
- Getting stuck between the mattress and the wall or furniture.
- Falling out of the parental bed.
- Suffocating on a waterbed, soft mattress, soft bedding (pillows, blankets, quilts, etc.).
- Getting entangled in the mother's hair if it is excessively long.

The mattress must be flat, firm, and smooth. A soft surface such as a waterbed, sofa, beanbag or any other flexible and yielding structure increases the risk of SIDS. There must be no space between the mattress and the wall or furniture where baby could become stuck. There must be no loose blankets or pillows that could obstruct the baby's breathing.

Principles of sleep

For newborns, sleep begins with REM sleep and then non-REM sleep. By 3 months-old, babies enter NREM first, and then REM. The changed pattern reflects maturation of the central nervous system, its timing mechanisms, and increased production of melatonin.

By 6 months, babies experience five stages of sleep in each cycle, with each one lasting about one hour. The first two stages involve light non-rapid-eye movement (NREM) sleep, the third and fourth stages involve periods of deep NREM sleep, and the fifth stage involves active rapid-eye movement (REM) sleep.

Babies spend twice as much time in light sleep than deep sleep. If the baby is put in her cot at this stage, she may wake up. During the first stage of light sleep, baby's muscles



relax and her eyelids flutter. She may twitch, grimace, suck intermittently and breathe irregularly.

During the second stage of light sleep, the baby's limbs are deeply relaxed, her fists unfold, and her breathing becomes shallow and regular. However, she can still be aroused at this stage. Very young babies may spend up to 20 minutes in this stage before entering deep sleep. Older babies may enter the deep sleep within a few minutes, and they may be difficult to wake up.

During the 4 stages of NREM sleep, the immune system is boosted, and physical growth occurs. During deep sleep, pituitary hormones peak, which promote rapid brain and body growth. Learning is thought to occur during REM sleep.

After deep sleep, babies enter the frenzied period of active REM sleep. During this stage, they grimace and fuss, the muscles tighten and jerk involuntarily, the eyes dart about in all directions and breathing and heart rate become irregular.

During rapid eye movement (REM) sleep the brain is awake and highly active, but in a dream state. If the parent wakes up during REM sleep, the dream can be recalled. However, if REM sleep is constantly interrupted, it can affect mental performance and well-being during the day, leaving the parent feeling tired, irritable, forgetful, and sleep deprived. Unless disturbed or picked up abruptly, very young babies do not suffer as much as adults because they naturally wake up at the end of REM sleep.

The period between the end of REM sleep and the next cycle of sleep is the most vulnerable one. Very young babies will wake up if hungry, too hot, too cold or if they are uncomfortable. If the baby should need a feed or nappy change (most babies will tolerate a wet nappy), it should be kept as low-key as possible.

The following strategies can help:

- Keep the room dark and avoid switching on the light since it will increase wakefulness.
- Keep noise or other distractions to a minimum.
- Avoid any form of stimulation.
- Keep interactions such as eye contact and talking to a minimum during and after the feed.
- Avoid nappy changing unless necessary.

When a regular sleep pattern has been established at about 6-months-old (sometimes sooner), and the baby wakes up in the night, rewarding her with too much attention whenever she stirs or whimpers at the end of a sleep cycle can become a habit, which will be difficult to break. The baby may also suffer from lack of sleep and become more irritable and fussier during the day and cry more. Placing a reassuring hand on the baby's tummy will provide comfort until she settles back to sleep again.



Waking up at the end of REM sleep is vital to survival. If the newborn's sleep state was so deep that she could not communicate her needs, then her wellbeing could be threatened. For this reason, parents should not feel pressured to get their newborn to sleep too long, too deeply, too soon. From 3-months on, the baby may drift into the next sleep cycle if undisturbed. However, if the baby has an infection, is teething or experiencing growth pains, anxiety or separation, her sleep pattern may be temporarily disrupted.

Brain Activity

During the initial stage of light sleep, brain waves slow and roll. During the second stage of light sleep, brain waves resemble a spindle moving across a loom. During deep sleep, brain waves deepen, and dreaming may occur, although this is not as common as in active REM sleep.

The fifth stage of the cycle involves active REM sleep. In this state, brain waves become erratic and fast. The burst of activity doubles the flow of blood to the brain, which promotes the production of nerve proteins that accelerate brain development. Nerve cells also connect with each other to set up complex networks in the brain and nervous system. Information acquired during the day is also processed, stored or discarded and certain memories are hard-wired. Areas of the baby's brain that control sight, hearing, smell, touch, balance and movement are also active and stimulated.

Scientists have recorded active sleep waves in fetuses from about 28 week's gestation, which suggests that the brain processes experiences in utero. However, the greatest period for dreaming occurs in the first 2 weeks of life. This is hardly surprising considering the explosion of new sights, sounds, tastes, smells and textures experienced after birth!

Even though newborns sleep so much, they not only take in and process information from the outside world but respond appropriately to it at the right time. Brain scans have revealed significant responses in the cerebral cortex to the sounds of crying, laughter, and music during REM sleep.

Staying asleep

The most vulnerable period for waking up is at the end of REM sleep. But, if the room is dark and quiet, and the baby is comfortable and not hungry, she will go back to sleep again.

If the baby should need feeding or a nappy change, keep it as low-key as possible. She will soon learn that night time is for sleeping and day time is for playing. If the baby is rewarded with too much attention, waking and play at odd hours may be prolonged into late childhood. The parent's reassuring hand on the baby's tummy will provide comfort until she settles back to sleep again.



If sleep problems persist, then parents need help to keep going. Health visitors are a good source of advice and support. Alternatively, a sleep clinic may be able to offer a solution.

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