

Recent studies suggest that behavioral problems in children **2-3** years of age may occur if they sleep less than **11** hours at night. Children this age should sleep up to **13** hours at night.

Lack of sleep can cause behavioral problems such as acting out, behaving aggressively and hyperactively. **Conversely, children's behavioral problems have been said to contribute to a lack of sleep in children.**

Different children need various amounts of sleep. If a child does not look well rested, he probably needs more sleep.

Waking up at night, a problem that occurs in **33%** of children **2-4** years old, can also cause behavioral problems.

Researchers believe that regular amounts of sleep deprivation may have long-term effects on brain function.

Studies on rats show that sleep is necessary for survival, demonstrating that life expectancy decreases with sleep deprivation.

Sleep is a dynamic activity.

The five stages of sleep progress in a cycle from **stage 1** to **REM** sleep, then the cycle starts over.

? What are the stages?

Stage 1 is known as the lightest stage of sleep. The body starts slowing down and it's easy to drift in and out of actual sleep. It's also the easiest to come out of when awakened.

Stage 2 Brain waves continue to slow down.

Stage 3 Both slow brain waves (delta waves) and faster, smaller ones appear during this stage.

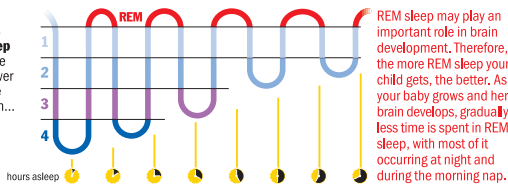
Stage 4 Mostly made up of slow brain waves (delta waves.) The entire body is deeply relaxed. This is the hardest stage from which to wake.

REM sleep is known for irregular and rapid breathing, constant eye movement and temporary paralysis of muscles. There is an increase in blood pressure and heart rate.

REM sleep lasts longest at night. During naps, REM lasts longer during morning naps than those in the afternoon.

Deep sleep
 • Growth hormones are released during deep sleep. Cells also increase in production and protein breakdown decreases during these two stages.

Cycles of sleep
 1
 2
 3
 4
 hours asleep



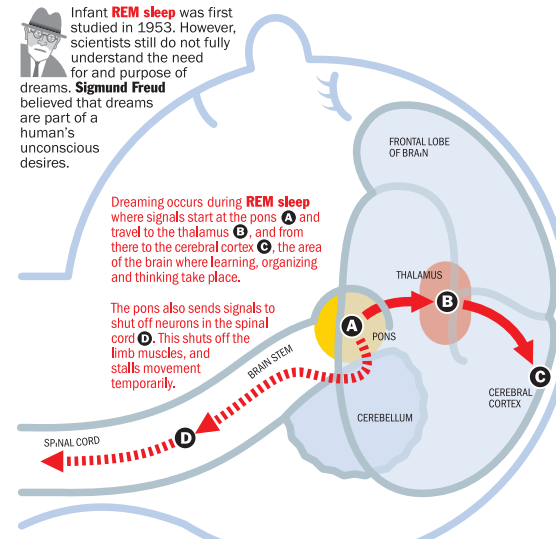
REM sleep may play an important role in brain development. Therefore, the more REM sleep your child gets, the better. As your baby grows and her brain develops, gradually less time is spent in REM sleep, with most of it occurring at night and during the morning nap.

The brain is always active.

Since the 1950s, we've learned that our brains are very active during sleep. Neurotransmitters, or nerve-signaling chemicals in our brains, control whether we are asleep or awake. Neurons, which connect the brain to the spinal cord, produce other neurotransmitters which keep some parts of the brain active during sleep and while awake.

? What are dreams?

Infant **REM sleep** was first studied in 1953. However, scientists still do not fully understand the need for and purpose of dreams. **Sigmund Freud** believed that dreams are part of a human's unconscious desires.



Dreaming occurs during **REM sleep** where signals start at the pons **A** and travel to the thalamus **B**, and from there to the cerebral cortex **C**, the area of the brain where learning, organizing and thinking take place.

The pons also sends signals to shut off neurons in the spinal cord **D**. This shuts off the limb muscles, and stalls movement temporarily.

REM sleep stimulates the cerebral cortex, which helps the brain develop learning ability. Scientists believe that's why infants spend 50% of their time in REM sleep.

What are the stages of sleep?

While sleeping, both adults and children pass through 4 stages and REM (Rapid Eye Movement)—in repeating cycles throughout the night.

Sources : NINDS, Brain Resources and Information Network; Healthy Sleep Habits, Happy Child, Marc Weissbluth, MD; Guide to Your Child's Sleep, American Academy of Pediatrics.

ACTION ITEMS

The ABCs of catching ZZZZZs

What's the best way to help your child develop good sleep habits? There are many expert views about what role parents should play when it comes to helping their children develop good sleep habits. Ultimately, the choice is yours. If you like an approach that:

1 is lenient about responding to your baby when he cries during the night and emphasizes consistent bedtime routines and positive sleep associations, check out Dr. Jodi Mindell's book, *Sleeping Through the Night: How Infants, Toddlers and Their Parents Can Get a Good Night's Sleep*.

2 advocates sticking firmly to routine and letting your child cry at bedtime for extended intervals of time before you provide her with comfort, read Dr. Richard Ferber's book, *Solve Your Child's Sleep Problems*.

3 focuses on training your baby to go to sleep and comfort himself on his own by keeping nighttime feedings short, waking him if his daytime naps last more than a few hours and using your voice or a gentle pat to comfort him when he cries, try the American Academy of Pediatrics' book, *Guide to Your Child's Sleep*.

4 promotes the family bed and other ways of being there for your child to provide a comforting, relaxing sleep environment, look at Dr. William Sears' book, *Nighttime Parenting*.

5 emphasizes the prevention of sleep problems and teaches healthy sleep habits by synchronizing soothing techniques with your child's natural rhythms, read Dr. Marc Weissbluth's book, *Healthy Sleep Habits, Happy Child*.

AND REMEMBER, whichever approach you choose, be consistent.