

The first question we need to answer is how much sleep do we really need?

Sleep researchers call people who sleep less than 6 hours a night "short sleepers" and those who sleep 9 hours "long sleepers". 8 hours is the usual quoted average, although it is more likely to be 7 ?.

We all know of people who need little sleep and some who need a lot. Perhaps this is just an inborn thing. I know that my three children all differ in their sleep patterns and needs and this dates right back to during the pregnancy, including their sleep-wake cycles.

The amount of sleep needed doesn't vary with age as was previously thought, but the *pattern* of sleep does change. Older people tend to sleep more lightly and are more likely to be disturbed by environmental factors that younger folk might sleep through untroubled.

There is a gradual decline in delta sleep, the deepest sleep most associated with growth and bodily recovery. Some older people may have hundreds of short awakenings at night, each lasting only 15 seconds or less. This may feel as if all night has been spent awake.

The sleep-wake cycle is complex and varies considerably from person to person. It can sometimes be possible to trace strong or weak sleep systems through families, but that doesn't necessarily mean insomnia is genetic.

During sleep, brainwaves differ from those whilst awake. Predominantly, instead of beta waves or alpha, made when the eyes are closed and you are relaxed, there are slower, bigger waves known as delta and theta waves.

There are basically 2 types of sleep: REM and non-REM (NREM): dreaming and non-dreaming.

REM stands for rapid eye movement, because our eyes tend to move about a lot in this stage. Usually, just before dreaming starts, our brain relaxes all our muscles so that we are practically paralysed. So any movements we make during dreaming tend to be quite small. (we often see cats and dogs twitch during their sleep).

Experiments with animals that have blocked out this muscle relaxation have shown that animals act out their dreams. This can also happen in people in whom the inhibitory message is malfunctioning: they may move about violently during their dreams, and may even hurt themselves: this is known as REM behaviour disorder and it can be treated.

In most people, REM sleep happens about every 90 minutes throughout the night, but the first period is very short, about 5 minutes, the second about 10 minutes, the third, 15 and the final dream may last between 30 minutes and an hour.

If we sleep 6 hours, we will have 4 dreams, but most are forgotten unless we wake up from them.

NREM sleep is either Stage 2, the most frequent type or Stage 3 and 4, delta sleep, which is much deeper. There may be some simple thinking, but it tends to be fragmentary.

As we go to sleep, it is like going down stairs.

In Stage 1, the transition between waking and sleeping, we may have drifting thoughts for a few minutes, but don't feel asleep.

As we get into Stage 2, our brain puts out patterns called sleep spindles and K-complexes.

Then we go into Stage 3 and 4. Changing between stages occurs gradually, with one stage blending into the next.

The time to the end of the first REM sleep is referred to by sleep specialists as the first sleep cycle. There are 4 to 6 sleep cycles per night depending on how long we sleep.

**Delta sleep**, the deepest, seems the type that facilitates bodily recovery; people deprived of it complain of malaise, nothing seems to function quite right. **Stage 2 sleep** is less intense but still involved in restoring bodily well-being.

### **REM sleep**

is more concerned with mental well-being.

During sleep, the body is busy, and there are numerous changes according to the circadian rhythm, with fluctuations in hormone levels, such as cortisol, as well as changes in heart rate and breathing.

During delta sleep, blood flow is mostly directed to muscles, but during REM sleep, as much as a quarter of all blood circulating goes to the brain. At the onset of delta sleep, there is the largest spurt of growth hormone in the whole 24-hour cycle; this hormone is not only used for growing, but also for tissue repair.

Other physiological reactions include sexual arousal during REM sleep: men (usually unknowingly) experience an erection (including children to those in their eighties, and even those who are impotent whilst awake); these occur regardless of the context of the dream. Women also experience similar arousal.