



## Importance of Sleep in Daily Life

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### Abstract

Sleep is the 4th essential commodity in support of life. The period for which we have to sleep depends on many factors including genetics. The suprachiasmatic nucleus regulates daily sleep-awake cycle. Sleep works both ways that is to store and refresh the memoirs as well erase bad memories how it happens it is not yet well understood.

**Keywords:** Number of brain functions; Nerve cells; Physical; Mental

### Introduction

Sleep is important to a number of brain functions, including how nerve cells (neurons) communicate with each other. One of the two main things that control sleep is the ensemble of “physical, mental, and behavioral changes that follow a daily cycle” — called circadian rhythms [1]. The suprachiasmatic nucleus, a structure in the brain formed by a group of about 20,000 neurons, or nerve cells, coordinates all the biological clocks. In fact, the brain and body stay remarkably active during sleep. Recent findings suggest that sleep plays a housekeeping role that removes toxins in our brain that build up while we are awake. Sleep is vital to brain health, including cognitive function. The sleep-wake cycle is influenced by many factors. A regular sleep-wake schedule is related to better sleep and better brain health [2,3]. Sleep deprivation makes us moody and irritable, and impairs brain functions such as memory and decision-making. It also negatively impacts the rest of the body – it impairs the functioning of the immune system, for example, making us more susceptible to infection Sleep is the 4th essential commodity in support of life. The first is the air without which life cannot be sustained for a few minutes. The next is water cannot live without it a few days and the third one is food can not live without it for a few weeks. Sleep is the fourth one without this cannot survive more than a month. All human being spends about one-third of his or her lifetime in sleep only. And it is essential too, without which it is difficult to manage our daily life [4-7]. Sleep is

the regular state of natural rest observed in all mammals, birds, and fishes. Sleep is not actually “unconsciousness,” but rather, it is a natural state of rest characterized by a reduction in voluntary body movement, decreased reaction to external stimuli, an increased rate of anabolism (the synthesis of cell components), and a decreased rate of catabolism (the breakdown of cell constituents). Therefore, since consciousness is literally the awareness of the surroundings, being asleep is just an altered state of consciousness, as opposed to being unconscious. However, when a sleeping person is stimulated, he can wake up easily. During sleep the autonomic nervous system becomes active and coordination between brain and nerves remain intact.

### Genes and sleep

Genes may regulate the period per day sleep we need. Recently many genes were identified which regulate sleep and sleep disorders, including genes that control the excitability of neurons, and “biological clock”. Genome-wide association studies have identified sites on various chromosomes that increase our susceptibility to sleep disorders Also, different genes have been identified with such sleep disorders as familial advanced sleep-phase disorder, narcolepsy, and restless legs syndrome (human syndrome). Some of the genes expressed in the cerebral cortex and other brain areas change their level of expression between sleep

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and wake. Additional research will provide better understand of inherited sleep patterns and risks of circadian and sleep disorders.

### Sleep helps to learn and unlearn

Sleep is a complex and dynamic process and now scientists are beginning to understand. Using the EEG readings, the scientists examined three sleep phases: REM sleep, light non-REM sleep, and deep non-REM sleep [8-10]. Although the exact mechanisms are not known, learning and memory are often described in terms of three functions. Acquisition refers to the introduction of new information into the brain. Consolidation represents the processes by which a memory becomes stable Recall refers to the ability to access the information (whether consciously or unconsciously) after it has been stored. Another area that has been the focus of much research is the relationship between sleep and learning or memory formation. Scientists know for sure that sleep is crucial for learning, REM sleep is a critical phase of sleep for learning and memory, a time when the brain consolidates, processes, and stores information. Sleep promotes memory consolidation; the process takes place in three separate stages: a, acquisition the information, b, consolidation- processes in the brain, and c, recall, accessed the learned information. However, sleep does not just enable the brain to learn new things but also unlearn. The EEGs also captured sleep spindles that occurred when the sleeping brain learned new sounds. Sleep spindles are spikes in oscillatory brain activity that previous research has linked with learning and memory consolidation. After each sleep session, the experimenters asked the participants to re-listen to the sound sequences and recognize them. They assessed their learning performance through tests. When exposed to the sounds during REM sleep or during light non-REM sleep, the participants were better at recognizing them when awake. But, when exposed to the new sounds during deep non-REM sleep, they had a harder time recognizing the sound sequence during wakefulness. Also, while “EEG markers of learning were readily observed in light [non-REM] sleep, they were markedly absent in deep [non-REM] sleep,” report the scientists. The deep sleep helps maintain neuroplasticity. Specifically, light non-REM sleep (stage 2) may help excite synapses, while deep non-REM sleep may help them relax, or ‘downscale. Such a contrast between light and deep sleep is consistent with a qualitative distinction between these two sleep stages in relation to neural plasticity in other words, deep sleep may help us unlearn or forget because forgetting is a natural byproduct of preserving neuroplasticity; forgetting is a byproduct of our ability to learn.

### Sleep deprivation

During sleep the brain and the body regain energy. In children and teens, sleep also helps support growth and development [11,12]. Getting inadequate sleep over time can raise risk for chronic

(long-term) health problems (Figures 1 and 2). Sleep performs a restorative function for the brain and body as evidenced by the myriad symptoms of metabolic dysfunction that result when animals or human beings are deprived of sleep without enough sleep, the brain cannot function properly. This can impair our abilities to concentrate, think clearly, and process memories

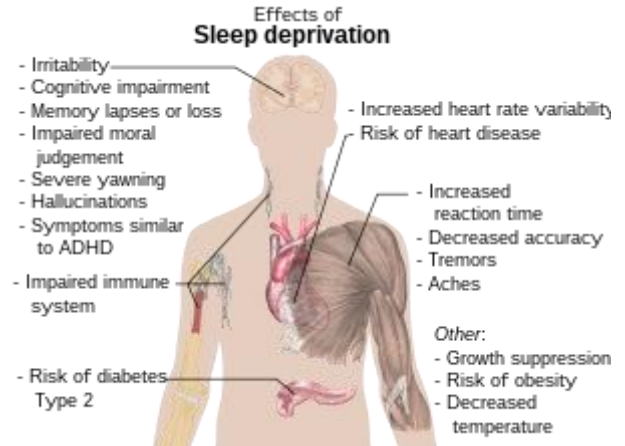


Figure 1: Effects of sleep deprivation.

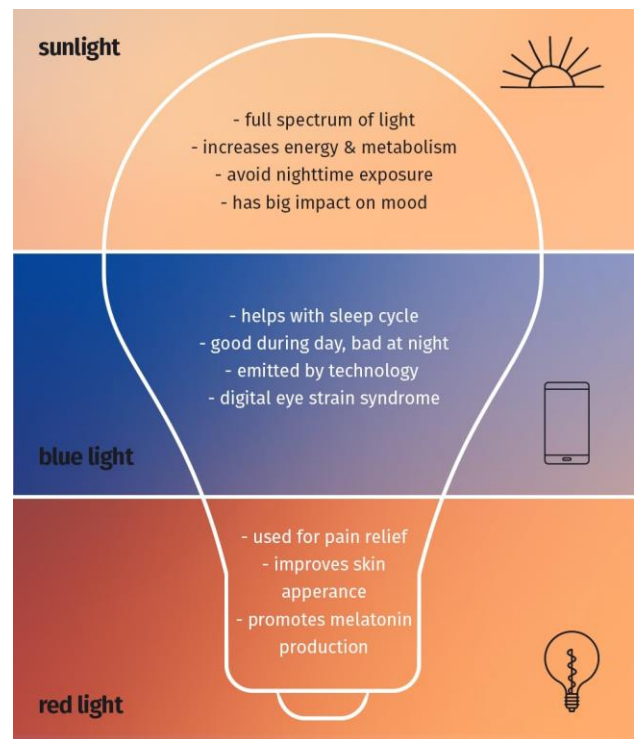


Figure 2: Different types of Light.

### Effects of different types of Light on Sleep

Light exposure at night can hinder transitions between sleep cycles, reducing the quality of sleep. Too much light can cause repeated awakenings, interrupting the sleep cycle and reducing time spent in deeper, more restorative sleep stages. Light also influences the circadian rhythm (The brain contains a special region of nerve cells

known as the hypothalamus, and a cluster of cells in the hypothalamus called the suprachiasmatic nucleus, which processes signals when the eyes are exposed to natural or artificial light). These signals help the brain determine whether it is day or night. As natural light disappears in the evening, the body will release melatonin, a hormone that induces drowsiness [13-15]. When the sun rises in the morning, the body will release the hormone known as cortisol that promotes energy and alertness [16,17]. The function of sleep-in health and in diseases is being increasingly studied specialized sleep laboratories throughout the world. Not only insomnia (sleeplessness) but more recently elucidated sleep disorders such as sleep apnea and narcolepsy) are evaluated in such facilities. The increasing prevalence of sleep disorders is likely to be a function both of more sophisticated diagnostic tests and the disruption of the normal day-night cycle or circadian rhythm in modern societies.

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