

# Under the Covers: Are You Getting Enough?

BY DR. SURINDER POONIAN



“Beep, beep, beep beep”. The sound of the alarm clock in the morning. Time to wake up. But I hit the snooze button. “Five more minutes,” I think to myself as I roll over and drift back into a deep slumber. Sounds familiar? In a rapidly evolving world with busy lives and technological advances, this can be pretty common.

## What is sleep?

Sleep can be defined as a natural periodic state of rest in which the eyes usually close and consciousness is partially

or completely lost. There is a characteristic cycle of brain wave activity. We spend 36% of our lives sleeping. If we live to 90 years of age, that is 32 years asleep! Clearly this behaviour is an essential part of the human experience<sup>1</sup>.

There are multiple schools of thought on why we need to sleep. Some of these include restoring and replacing physiological structures through the night, conserving energy (sleep uses around 110 calories a night), and processing information and consolidating memories in the brain.

Both the quantity and quality of sleep have an impact on how we feel when we wake up in the morning. Many life-

style and health factors govern the amount of sleep each individual requires. In general, infants require about 12 to 15 hours a day, teenagers need about 8 to 10 hours and for most adults, 7 to 9 hours is recommended but is often a luxury<sup>2</sup>. Few of us make sleep a priority which can lead to ‘sleep debt’, where you ‘owe’ your body rest. This deprivation can make itself known in a number of ways.

There are several tell-tale signs that you are not getting enough sleep<sup>3,4</sup>:

- Hitting the ‘snooze’ button regularly
- Drowsiness, lack of focus

- Impaired memory and physical performance
- Increase in blood pressure
- Reaching for caffeine, sugars or carbohydrates to get you through the day
- Weight gain due to an increase in ghrelin (the hunger hormone) and decrease in leptin (the hormone that tells you to stop eating)
- Insulin resistance leading to type 2 diabetes
- Increased cortisol levels and stress
- Coughs and colds due to a compromised immune system

## Benefits of sleep

Sleep is a fundamental pillar of our overall health through the rest and repair of vital structures<sup>5</sup>.

Nervous system	Neurons are given a chance to repair themselves.
Hormones and metabolism	Important hormones such as growth hormone, cortisol, follicle-stimulating hormone, luteinizing hormone, ghrelin and leptin are regulated.
Proteins	Proteins are building blocks for cell growth and repair. During sleep, many cells show an increase in production and there is a reduction in the breakdown of proteins.
Brain	Activity in parts of the brain that control emotions, decision-making processes, and social interactions is drastically reduced during deep sleep, suggesting that sleep may help people maintain optimal emotional and social functioning when awake.
Cognitive performance and mood	Improved memory: a study in rats showed that certain nerve-signaling patterns that the rats generated during the day were repeated during deep sleep.  Improved alertness and motor function.
Immune system	Recovery of injuries such as cuts and sore muscles.  Helps your body to defend itself. During sleep, more white blood cells are produced. Sleep may help the body to conserve energy in order to mount an immune response and fight disease.

## Reference

<sup>1</sup> Sleep Foundation. How much sleep do we really need? Available from: <https://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need> [Accessed 14 Oct 2016].

## References

<sup>2</sup> National Institute of Neurological Disorders and Stroke. Brain Basics: Understanding Sleep. Available from: [http://www.ninds.nih.gov/disorders/brain\\_basics/understanding\\_sleep.htm](http://www.ninds.nih.gov/disorders/brain_basics/understanding_sleep.htm) [Accessed 14 Oct 2016].

<sup>3</sup> Schmid SM, Hallschmid M, Jauch-Chara K, Born J, Schultes B. A single night of sleep deprivation increases ghrelin levels and feelings of hunger in normal-weight healthy men. *J Sleep Res.* 2008;17(3):331-4.

<sup>4</sup> Spiegel K, Leproult R, L'hermite-Balériaux M, Copinschi G, Penev PD, Van Cauter E. Leptin levels are dependent on sleep duration: relationships with sympathovagal balance, carbohydrate regulation, cortisol, and thyrotropin. *J Clin Endocrinol Metab.* 2004;89(11):5762-71.

<sup>5</sup> Sleep Foundation. Sleep Wake Cycle. Available from: <https://sleepfoundation.org/sites/default/files/SleepWakeCycle.pdf> [Accessed 14 Oct 2016].

### Stages of sleep<sup>6, 7</sup>

The two main stages of sleep are rapid-eye-movement (REM) sleep and non-rapid-eye-movement (NREM) sleep, which can be monitored by electroencephalograms (EEGs) recording brain activity. The sleep cycle repeats itself around every 90 minutes.

NREM (75% of night): As we begin to fall asleep, we enter NREM sleep, which is composed of stages 1-4. Brain waves become slower as the stages progress.

#### Stage 1

- Between being awake and falling asleep
- Light sleep

#### Stage 2

- Onset of sleep
- Becoming disengaged from surroundings
- Breathing and heart rate are regular
- Body temperature drops (so sleeping in a cool room is helpful)

#### Stages 3 and 4

- Deepest and most restorative sleep
- Blood pressure drops
- Breathing becomes slower
- Muscles are relaxed
- Blood supply to muscles increases
- Tissue growth and repair occur
- Energy is restored
- Hormones are released

REM (25% of night): First occurs about 90 minutes after falling asleep and recurs every 90 minutes, getting longer later in the night. The “active” portion of sleep.

- Provides energy to brain and body
- Supports daytime performance
- Brain is active and dreams occur
- Eyes dart back and forth

### Sleep for Dummies

Some top tips that may help with getting a good night's rest:

- Wind down – get into a bedtime routine and give your body and mind time to relax.
- Lower the lighting – creating a dark and quiet environment will allow the brain to produce more melatonin which makes us feel less alert. Melatonin levels decrease again by morning, preparing the body for being awake.
- Turn off technology – they act as a stimulus and distraction to rest.
- Cut the caffeine and alcohol – stimulants keep the brain awake and depressants will have a mildly sedative effect but will harm repair processes. Both result in poor biological sleep.
- Keep sleep times consistent – your body will get into a natural routine and will later know when it is time to wake up and sleep.
- Choose light foods before bed – this will allow your body to rest and repair rather than rest and digest which may improve quality of sleep<sup>5</sup>.



**Dr. Surinder Poonian** is a general dental practitioner in Singapore taking a holistic view on healthcare. In her spare time she enjoys travelling, outdoor activities, karate and has a keen interest in general well-being. Surinder has also been involved with various volunteering projects including dental mission trips, teen retreats and public education on oral health.

#### References

<sup>5</sup> Sleep Foundation. Sleep Wake Cycle. Available from: <https://sleepfoundation.org/sites/default/files/SleepWakeCycle.pdf> [Accessed 14 Oct 2016].

<sup>6</sup> Division of Sleep Medicine Harvard Medical School. How is sleep regulated? Available from: <http://healthysleep.med.harvard.edu/healthy/science/how> [Accessed 14 Oct 2016]

<sup>7</sup> Sleep Foundation. How sleep works. Available from: <https://sleepfoundation.org/how-sleep-works/what-happens-when-you-sleep> [Accessed 14 Oct 2016]

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