

## Memory, Thinking and Sleep

### Sleep plays a vital role in forming memories and creative thinking

Sleep is important for learning, memory and creativity:

- Sleep helps to prepare our brain for learning new things. When we are well rested, we can pay better attention to new information that we come across in our daily experiences.
- Sleep will help make new information 'stick'. During sleep, the brain replays memories from the day, making the neural connections stronger. This helps us remember the things we experienced when we were awake. Different stages of sleep play a role in forming different types of memory, such as learning "how" to do something (like playing a piano) compared to learning facts.
- Sleep also helps our creativity, helping us find new solutions to problems by looking at things in a new way while we sleep. You may have heard people say they will 'sleep on it' in order to solve a problem or make a decision.

### A lack of sleep can impact brain performance

We all know what it's like when we don't get enough sleep – we can feel foggy in

### THINGS YOU SHOULD KNOW

Sleep is important in preparing the brain for learning and remembering new information.

A lack of sleep reduces our ability to learn, pay attention to tasks and make well thought out decisions.

Untreated sleep disorders, such as Obstructive Sleep Apnoea (OSA), can impair attention, thinking and memory.

Poor sleep and irregular sleep/wake times can affect the academic performance of students.

the head the next day. It can be hard to concentrate on tasks, learn new things or use our memory effectively. In fact, if you have been awake for 18 hours, your reaction time and ability to concentrate is similar to a blood alcohol concentration of 0.05%. We also see a dip in performance on reaction time tasks in the early hours of the morning (2 - 4am), as well as in the early afternoon (2 - 4pm) when we are often less alert. It is important that shift workers are aware of these dips if they are working through the night or coping with sleep deprivation. Safety may be an issue.

Sleep loss can also affect our ability to make sound decisions. Researchers have shown that if we reduce sleep to 5 hours per night over a week people make more risky decisions on a gambling task, act

more impulsively and have poorer judgement (compared to those allowed to sleep for 8 hours each night). Brain scan studies show that when we are sleep deprived, the parts of the brain that help us weigh up negative outcomes are less active, while those areas that process positive outcomes are more active. Thus, we are less able to make sound decisions and successfully assess risk when we lack sleep. As a result, we may be more prone to accidents, injuries and errors at work and on the road (see Drowsy Driving).

## Can sleep disorders affect memory and thinking?

People with untreated sleep disorders, such as Obstructive Sleep Apnoea (OSA), often report trouble concentrating, remembering information or completing daily tasks (e.g., shopping lists). Studies show they do not perform as well on memory tasks, such as remembering a list of words, compared to healthy adults without a sleep disorder. They also have more difficulty recalling memories from their own lives (i.e., autobiographical memory). The good news is, that if your sleep disorder is effectively treated (see CPAP), many of the problems you experience in memory and thinking will improve.

## Can sleep issues affect academic performance?

Students commonly do not get adequate sleep. Sleepiness and poor sleep quality are widespread among high school (see Teenage Sleep) and university students.

This can affect their academic performance and daytime functioning (e.g., concentration). Research tells us that university students who have symptoms of a sleep disorder are more likely to receive poor grades than students without such symptoms. Also, we know that high school students who have more variable bedtimes and waketimes have poorer school performance.

Therefore, getting enough sleep each night and trying to go to bed and get up at around the same time each day is vital to students' academic success (See Sleep Hygiene: Good Sleep Habits).

## Where can I find out more?

[www.sleepfoundation.org/articles/how-lack-sleep-impacts-cognitive-performance-and-focus](http://www.sleepfoundation.org/articles/how-lack-sleep-impacts-cognitive-performance-and-focus)  
<http://healthysleep.med.harvard.edu/healthy/matters/benefits-of-sleep/learning-memory>

## Other useful links:

- [Shift Work](#)
- [Fatigue as an Occupational Hazard](#)
- [Drowsy Driving](#)
- [Obstructive Sleep Apnoea \(OSA\)](#)
- [Common Sleep Disorders](#)
- [CPAP: Continuous Positive Airway Pressure](#)
- [Teenage Sleep](#)
- [Sleep Hygiene: Good Sleep Habits](#)
- [How much sleep do you really need?](#)

## This information is produced by:

### Sleep Health Foundation

ABN 91 138 737 854

[www.sleephealthfoundation.org.au](http://www.sleephealthfoundation.org.au)

A national organisation devoted to education, advocacy and supporting research into sleep and its disorders.

### Sleep Disorders Australia

ABN 91 138 737 854

[www.sleepoz.org.au](http://www.sleepoz.org.au)

A voluntary group offering assistance and support to people and their families living with sleep disorders.

### Australasian Sleep Association

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[www.sleep.org.au](http://www.sleep.org.au)

The peak national association of clinicians and scientists devoted to investigation of sleep and its disorders.

*Disclaimer: Information provided here is general in nature and should not be seen as a substitute for professional medical advice. Ongoing concerns about sleep or other medical conditions should be discussed with your local doctor.*