



Why We Should Sleep More

Julia Daley

Hiroshima Bunkyo University

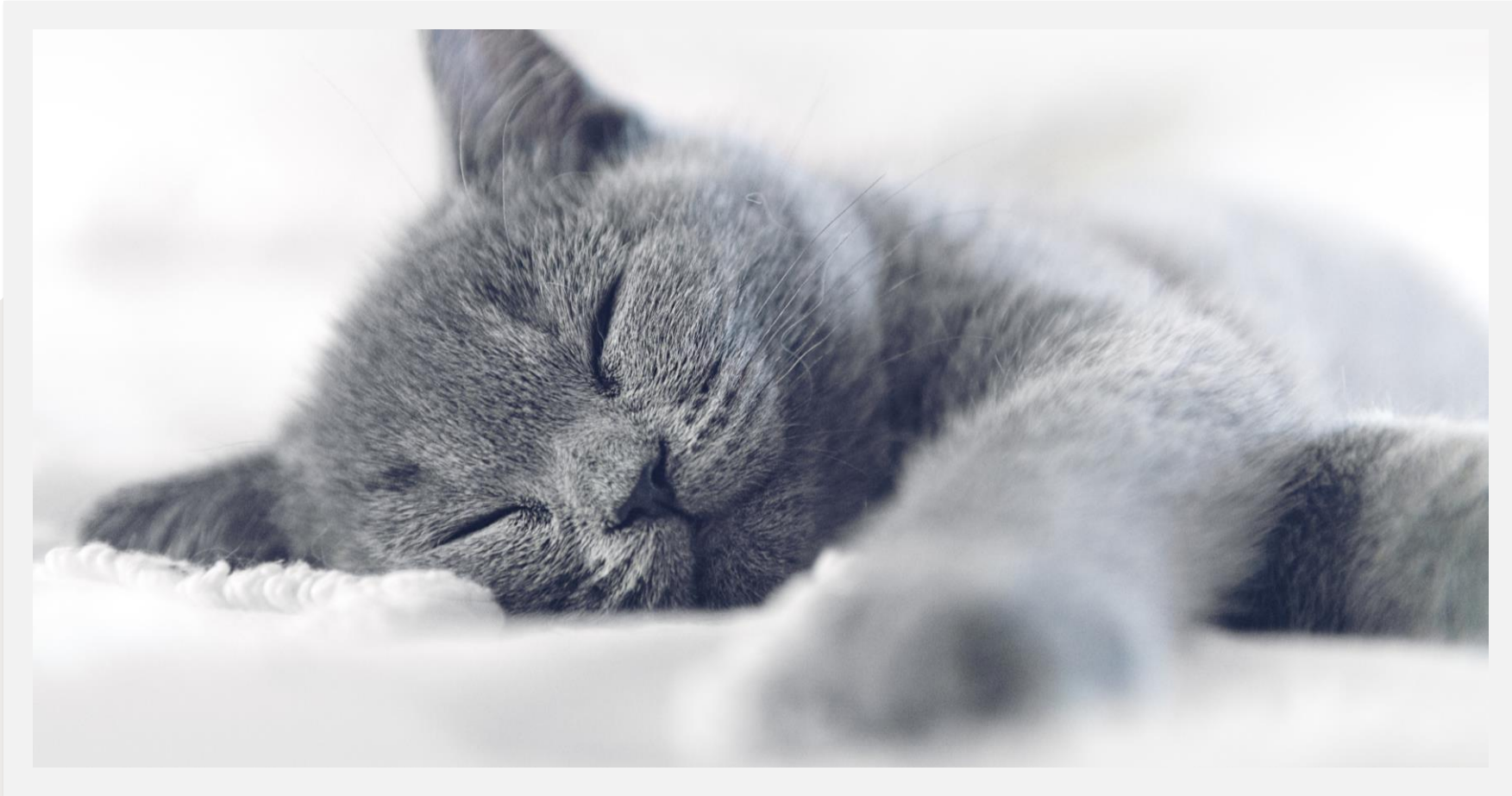
daleysensei@gmail.com

www.mindbrained.org

Outline

- Why do we sleep?
- How much should we sleep?
- What happens if we don't get enough sleep?
- How can we sleep better?
- Discussion
- Q & A

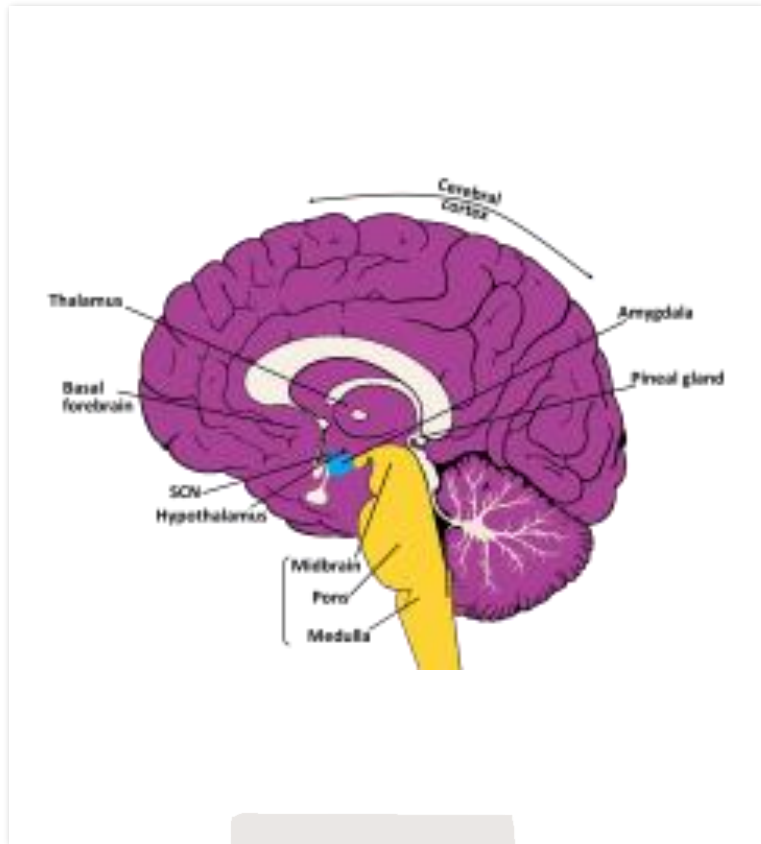




Why do we sleep?

Let's explore the neuroscience of what happens during sleep.

Brain Structures in Sleep



- Hypothalamus
- Brain stem
- Thalamus
- The Pineal Gland
- Basal Forebrain
- Amygdala

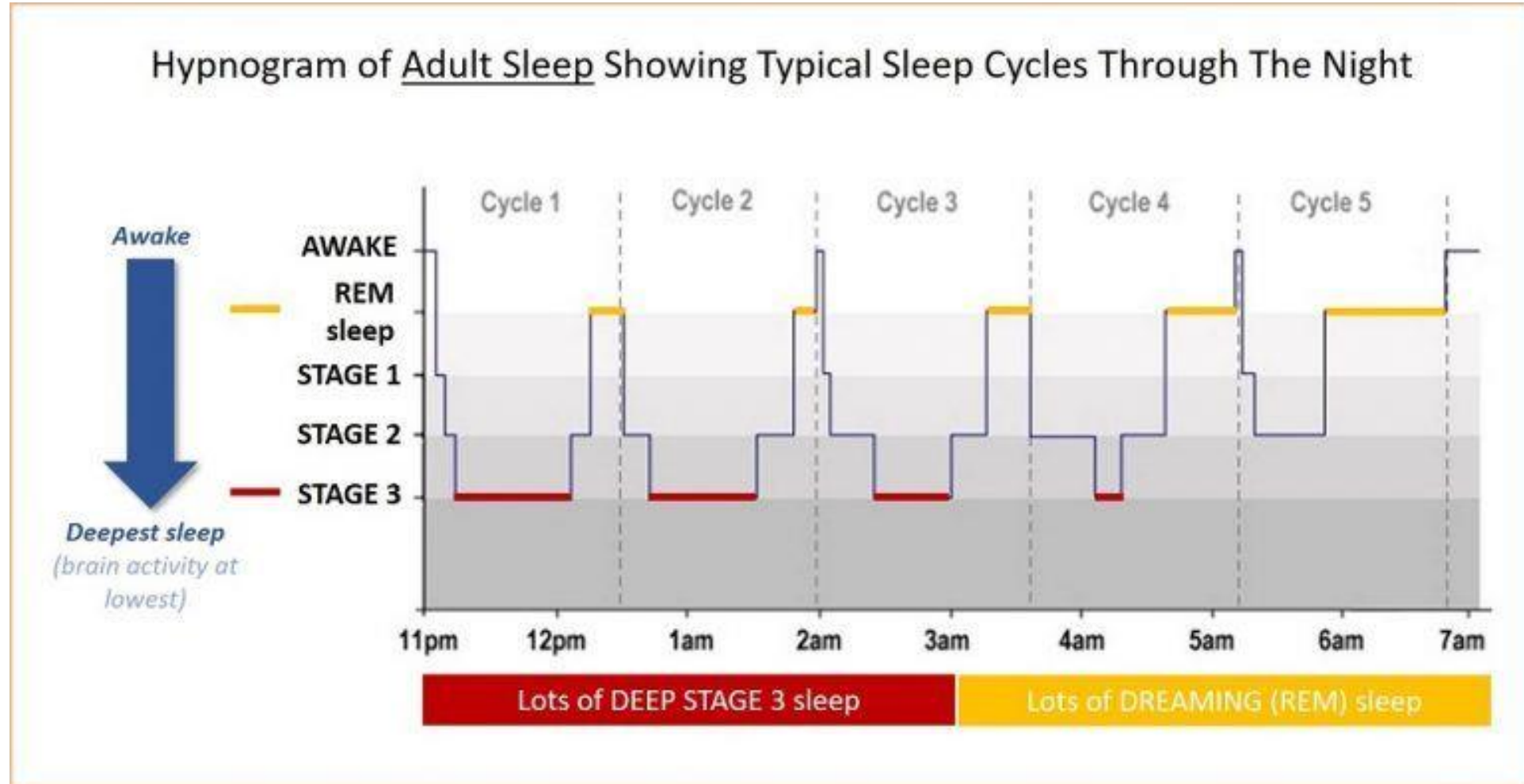
Sleep Stages

- **Rapid Eye Movement (REM):** *When dreaming occurs.*
 - eyes move rapidly under closed eyelids
 - breathing is faster / irregular
 - heart rate and blood pressure increase
 - body becomes temporarily paralyzed
- **Stage 1 (non-REM):** *Changeover from wakefulness to sleep.*
 - Heartbeat and breathing slow
 - Muscles relax with occasional twitches
 - Brain waves begin to slow

Sleep stages cont.

- **Stage 2 (non-REM): *Also known as light sleep.***
 - Heartbeat and breathing slow more
 - Muscles relax more
 - Body temperature lowers
 - Eye movement stops
- **Stage 3 (non-REM): *Also known as deep sleep.***
 - Heartbeat and breathing slow to lowest levels
 - Muscles are fully relaxed
 - Difficult to awaken

The Sleep Cycle



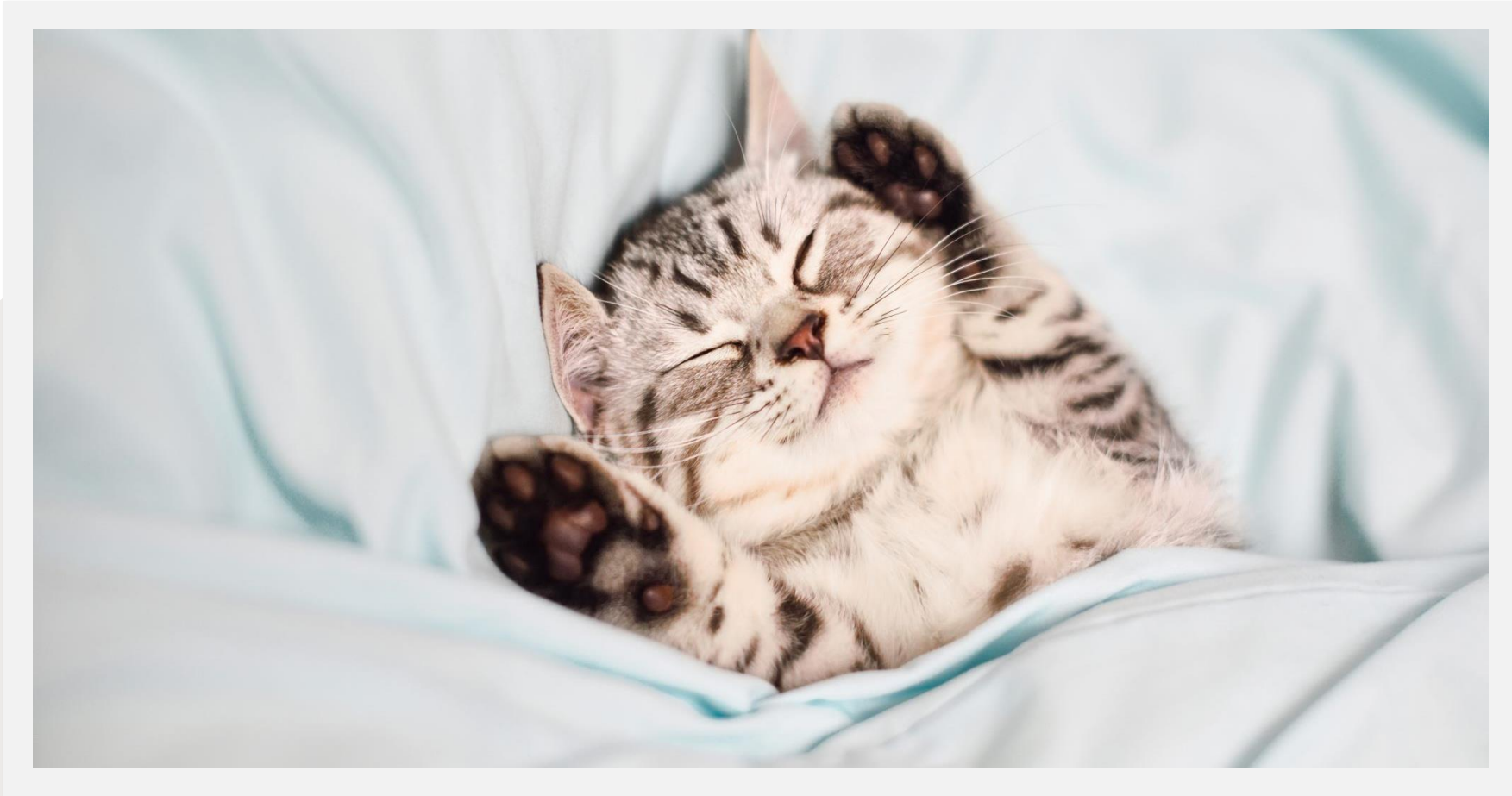
Why do we sleep?—we have some ideas

- **Body's housekeeping**

- Toxins like adenosine are removed from the brain during sleep
 - *Fun Fact: the more adenosine you have, the sleepier you feel. Caffeine blocks adenosine temporarily, making you feel wakeful.*
- The body restores itself
 - Muscle growth, tissue repair, protein synthesis—all occur mainly during sleep cycles

- **Memory consolidation**

- The brain organizes memory during sleep
 - It may also practice new skills during sleep
 - It may also solve problems during sleep

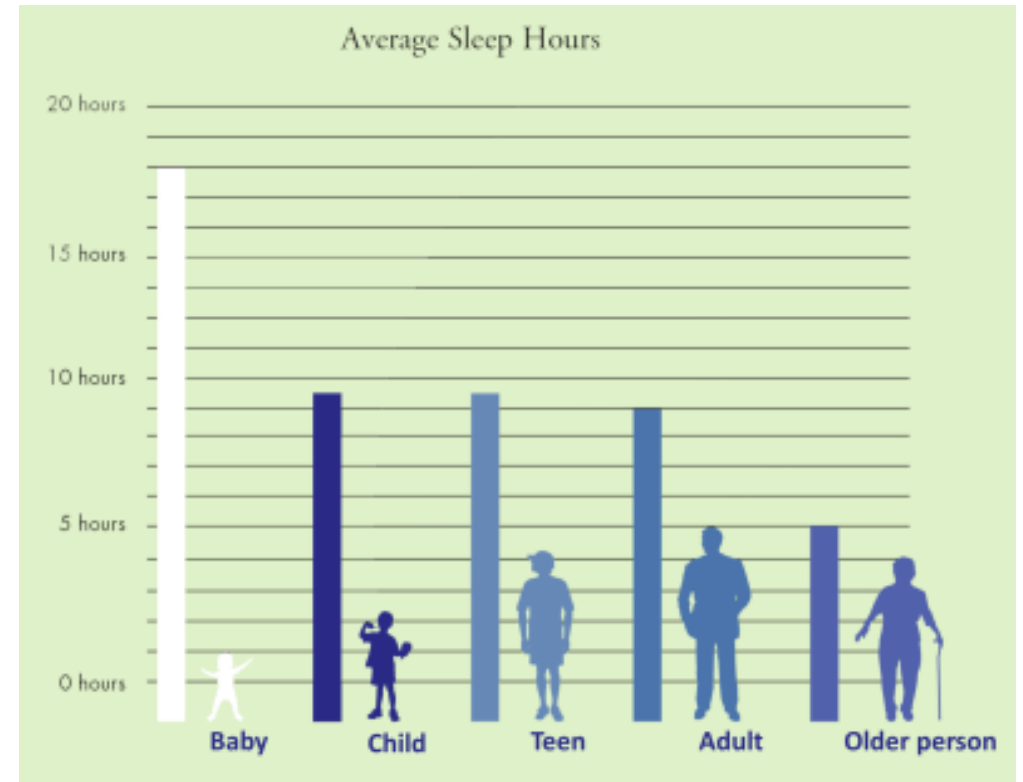


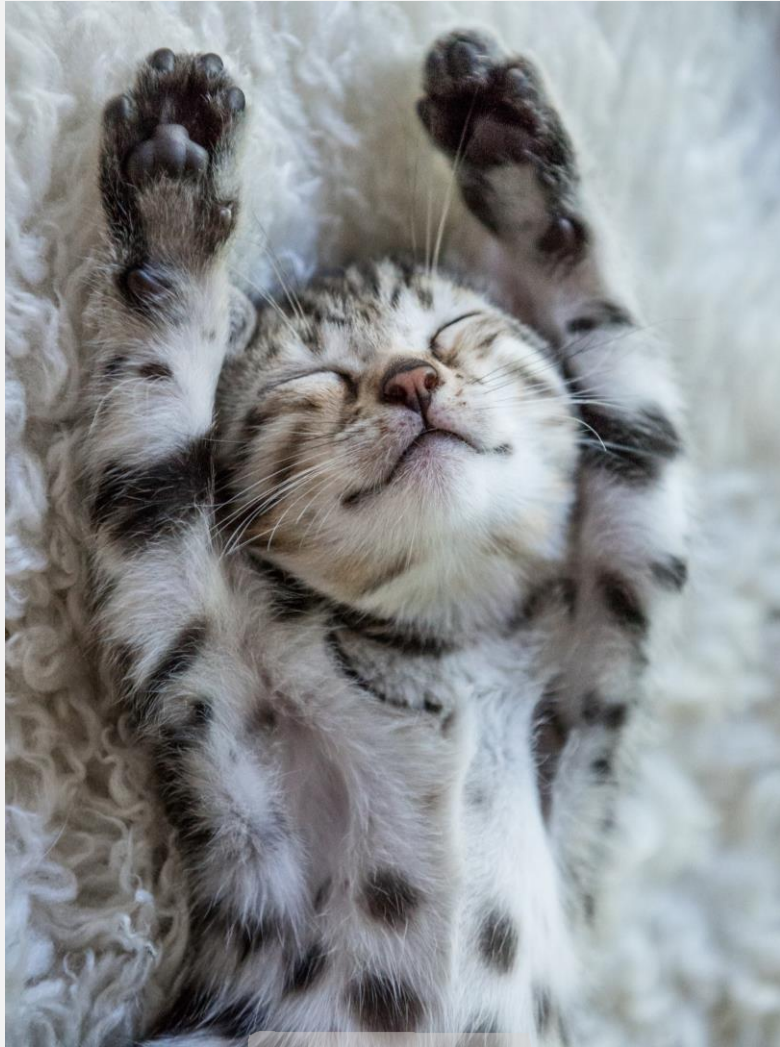
How much should we sleep?

Let's look at the recommended sleep ranges for different ages of people.

Recommended sleep ranges

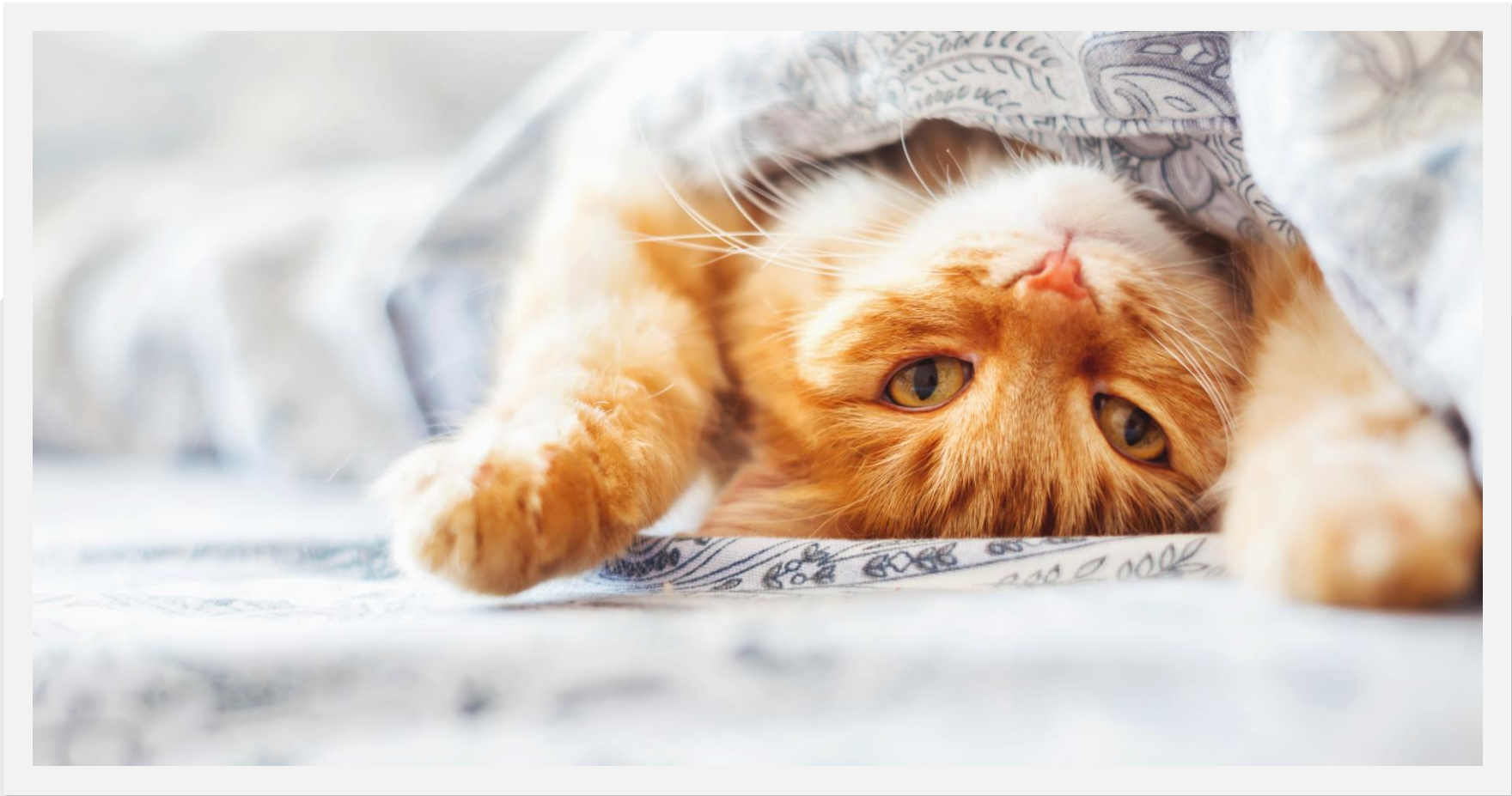
- **Elementary (6 ~ 12 years)**
 - 9 – 12 hours/night
- **Adolescent (12 ~ 25 years)**
 - 8 – 10 hours/night
- **Adult (25 ~ 64)**
 - 7 – 9(ish) hours/night
- **Senior (65+)**
 - 7 – 8 hours/day





Sleep needs vary per person

- Your sleep needs will be somewhere in the recommended ranges
- **How to learn your sleep needs:**
 - Go to bed at a natural time
 - Allow yourself to sleep without setting a wake-up alarm
 - What time do you wake up feeling refreshed?
 - Calculate the number of hours between sleeping and waking



What happens if we don't get enough sleep?

This is known as “sleep deprivation.”



Sleep deprivation in Japan

- Half of Japanese adults (40s) get <6 hours of sleep (2021)
 - May be due to late average bedtime (among the latest in developed world)
- Japanese university students average 5.9 hours of sleep on weekdays (2020)

The toll of sleep deprivation

Physical

- Increased risk of heart disease, kidney disease, high blood pressure, diabetes, stroke, obesity, and more
- High rates of injury and serious accidents
- Weakened immunity
- Poorer balance

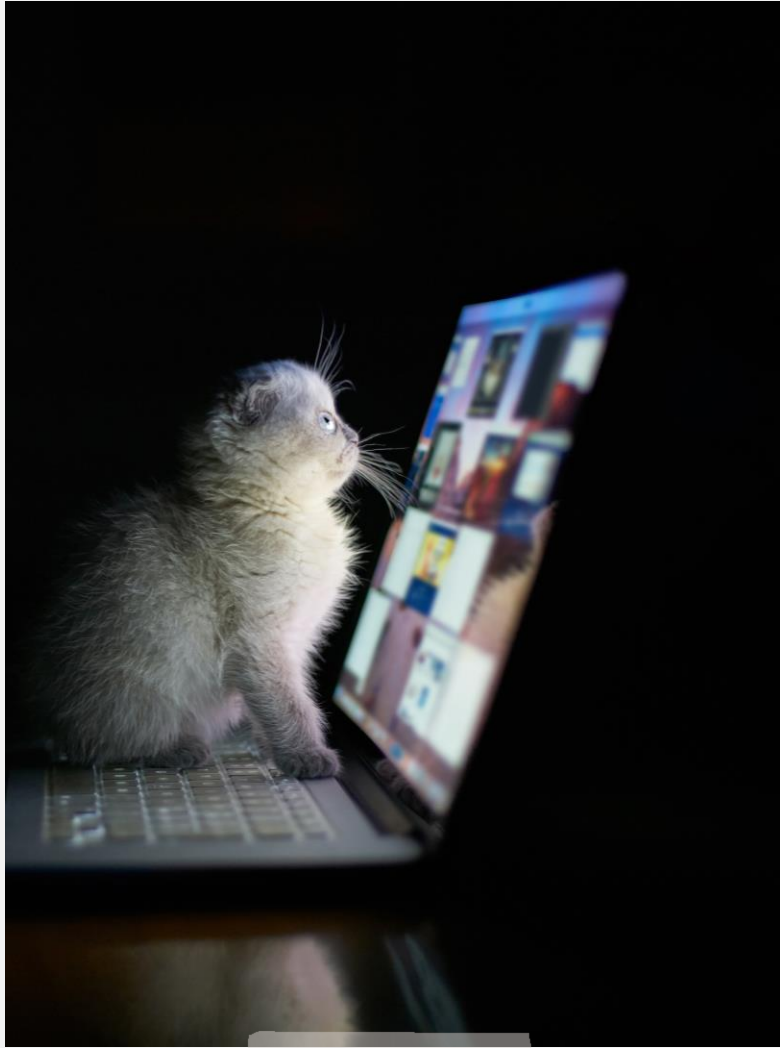
Psychological

- Impaired memory formation & recollection
- Poor concentration & problem-solving abilities
- Feeling moody, emotional, and quick-tempered
- Increased risk of depression



Signs of sleep deprivation (in adolescents)

- Difficulty concentrating
- “drifting off” during class
- Shorter attention spans
- Impaired memory formation & recollection
- Poor decision making & increased risk-taking
- Lower enthusiasm
- Mood swings
- Aggression
- Depression
- Slower physical reflexes & increased clumsiness
- Reduced performance in school & sports
- Increased absences



Common causes of (adolescent) sleep deprivation

- Hormonal time shift
- Screen use
- Busy after-school schedule
- Overstimulating hobbies
- Light exposure
- Vicious cycle
- Social attitudes
- Sleep disorders

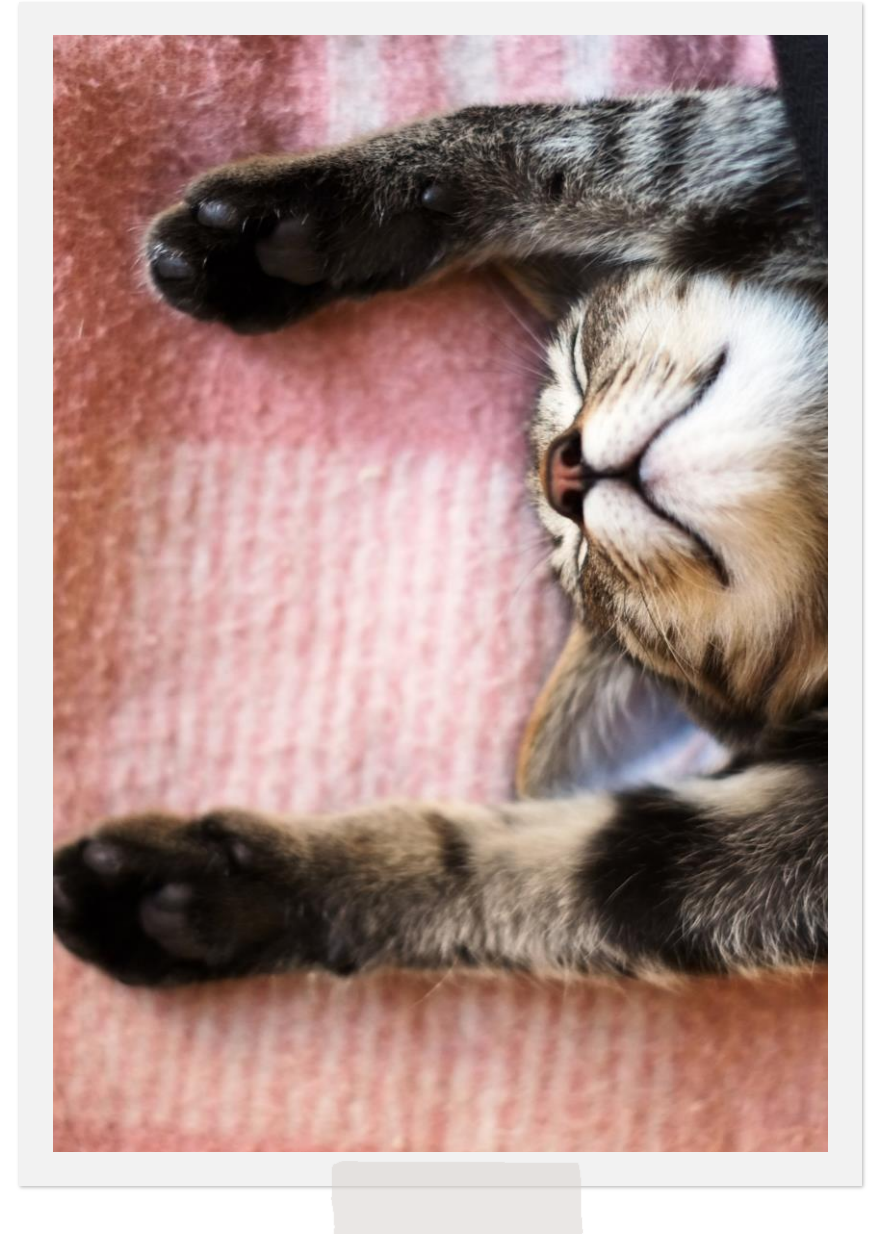


How can we sleep better?

Some tips and advice from science.

Tips for sleeping well

- **Set a consistent sleep schedule**
 - Don't give yourself jet-lag!
- **Exercise at least 20-30 minutes a day**
 - But avoid exercise ~3 hours before bed
- **Avoid caffeine and nicotine later in the day**
 - They make your brain feel awake
- **Relax before bed**
 - Suggestions include taking a warm bath, reading (a paper book), or other relaxing routines





More tips for sleeping well

- **Dedicate a space for sleeping**
 - Cover / turn off bright lights
 - Reduce loud sounds
 - Keep the space at a comfortable temperature
 - Keep digital screens out of the sleeping space
- **Don't lie in bed awake**
 - Do something else out of the bed until you feel tired
- **Check with your doctor about your sleep**
 - Sometimes sleep problems can be a sign of a larger health problem



Discussion

What role do teachers have (if any) to encourage better sleep in our students?



Q & A

What questions do you have?



Why We Should Sleep More

Julia Daley

Hiroshima Bunkyo University

daleysensei@gmail.com

www.mindbrained.org

References

- Kayaba, M., Matsushita, T., Enomoto, M. *et al.* Impact of sleep problems on daytime function in school life: a cross-sectional study involving Japanese university students. *BMC Public Health* **20**, 371 (2020). <https://doi.org/10.1186/s12889-020-08483-1>
- Ito, K., Kadotani, H., Okajima, I., Ubara, A., Ichikawa, M., Omichi, C., Miyamoto, T., et al. (2021). Large Questionnaire Survey on Sleep Duration and Insomnia Using the TV Hybridcast System by Japan Broadcasting Corporation (NHK). *International Journal of Environmental Research and Public Health*, 18(5), 2691. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/ijerph18052691>