



Live Life Well - PKU Patient Event

How we Sleep, and Tips to Sleep Better



Mark Dobson



In this presentation I will take you through the following:

- What is Sleep?
- How is sleep regulated
- Sleep in the PKU community



What is sleep?

How do some people fall asleep easily while we lie awake for hours?

Our brains control our sleep, every night when we fall asleep our brains are active controlling many processes for our physical and mental restoration for the next day. Sleep could be one of our bodies most complex biological processes.

The following video by the Economist Magazine help to explain this.

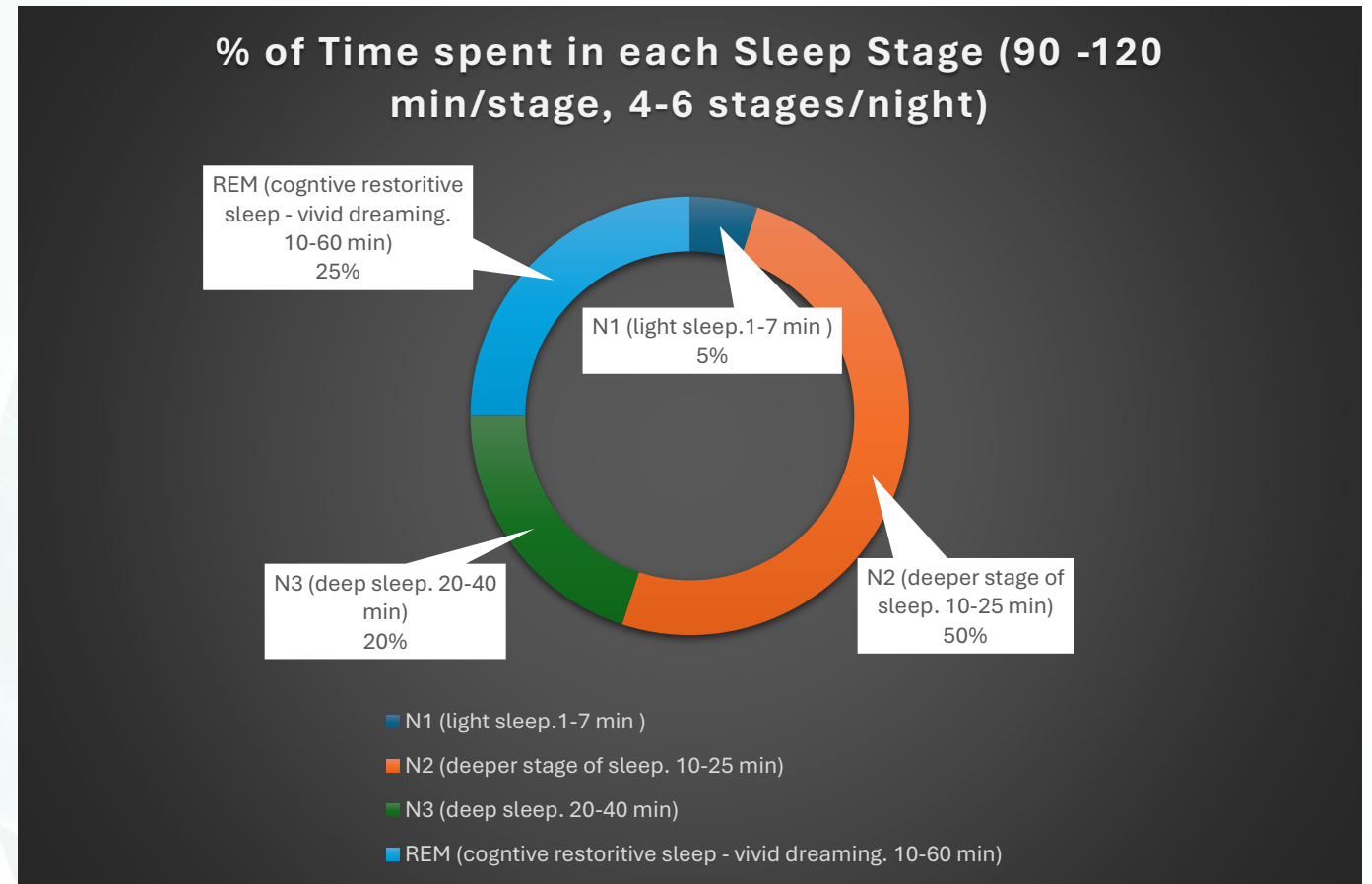


The
Economist



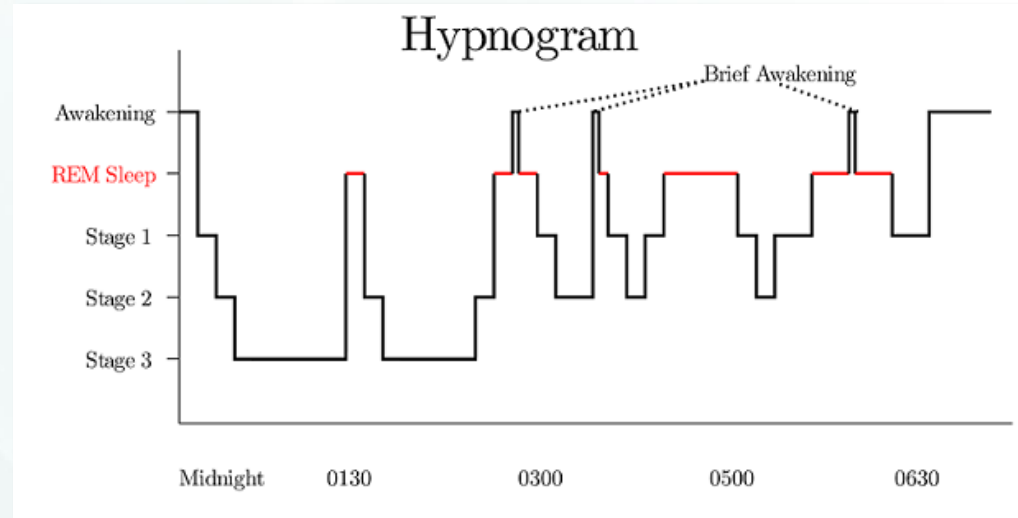
There are four sleep stages that we go through each night over a 90–120 minute cycle.

This cycle is repeated 4-5 times throughout a typical night.





Each stage of sleep has a specific function in aiding the brain to carry out its restorative functions.



N1 Function: To start the brain's transition from awake to sleep. Our parasympathetic nervous system (rest and digest) starts to take over from the sympathetic nervous system (fight or flight)

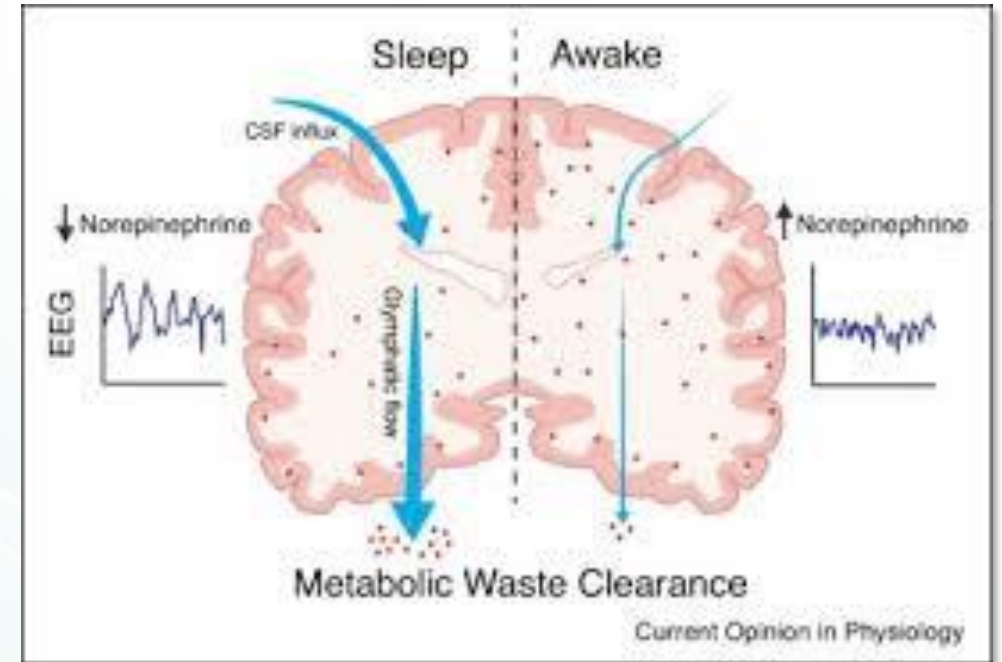
N2 Function: This helps our brain to consolidate memories for the long term for such skills like riding a bike or driving a car, that are performed automatically and without conscious thought.

N3 Function: This is a crucial sleep stage for physical recovery, repair and growth, by repairing tissues, building muscles and bones along with strengthening our immune system.



Metabolic Waste Clearance

The brain goes through a ‘dish washer cycle’ where the glymphatic system uses cerebrospinal fluid (CSF) to wash out our metabolic waste products from the brain, managing the brain health and helping to prevent neurodegenerative conditions such as Alzheimer’s disease.





Rapid Eye Movement

Rapid Eye Movement (REM) Sleep – Our Dreaming Stage, Cognitive Restorative Sleep.

Here our brain activity is similar to being awake.

To help prevent us from acting out our dreams, most of our muscles from below the brain stem are temporarily paralysed (atonia).

Function: REM sleep is crucial in our brain development, particularly in infants. This is also our 'cognitive restorative sleep' important for our emotional regulation. Here we process difficult events, helping us to process and regulate our emotions.



Our Brains have to slow down for sleep
“Anxiety is not a good bed partner”!

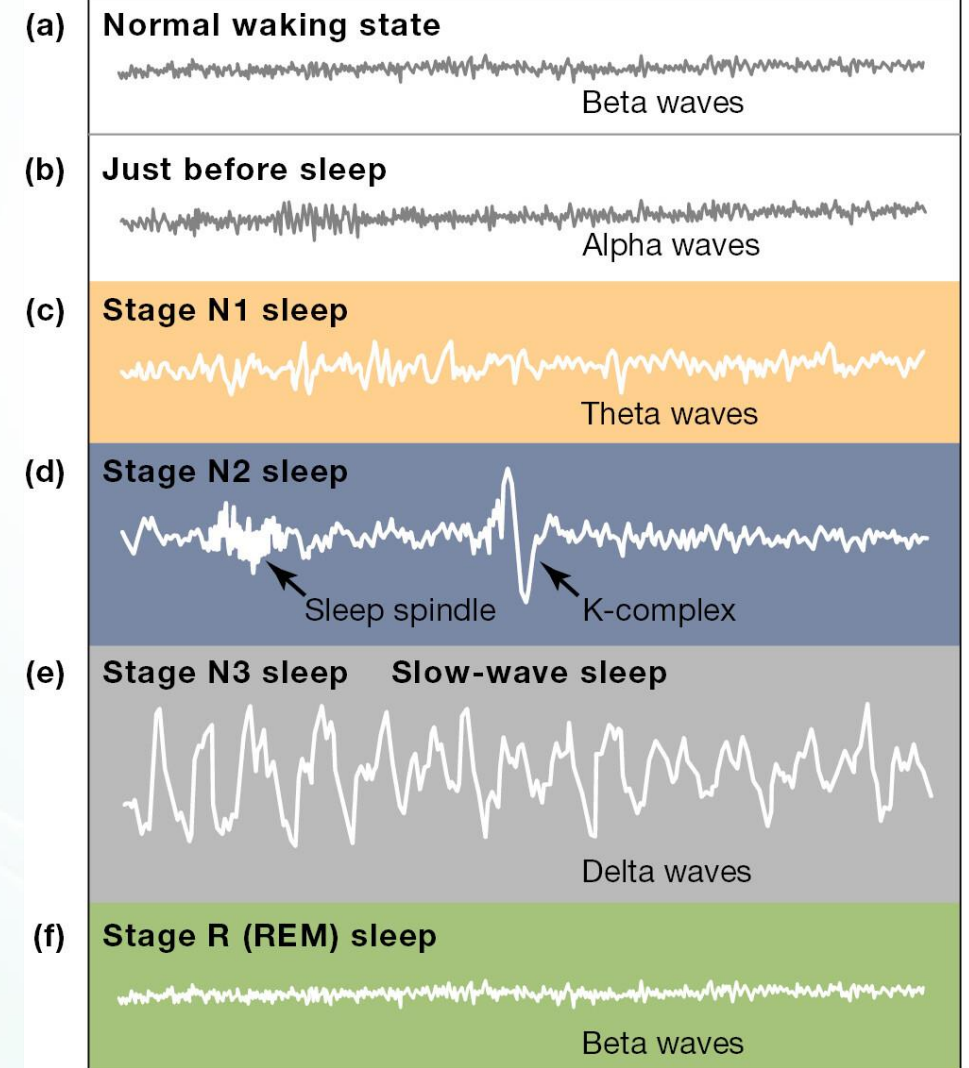


Activate the Parasympathetic Nervous System

Yoga (gentle)

Mindfulness

4-7-8 Breathing Exercise





How is Sleep Regulated?





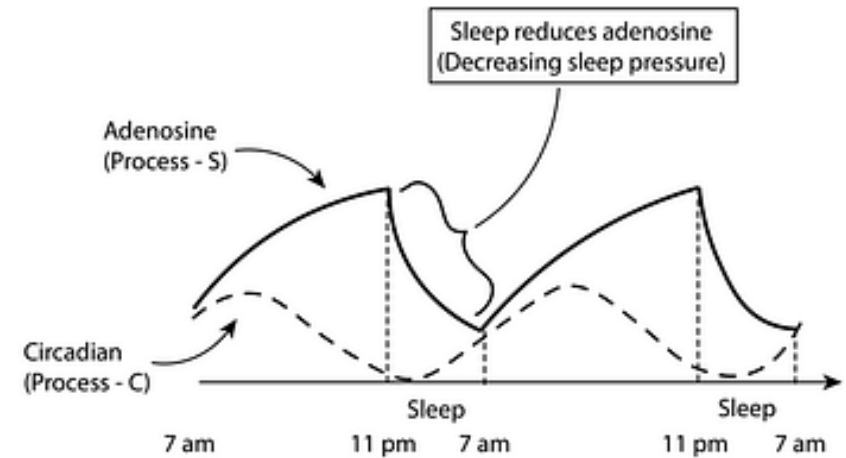
How is Sleep Regulated?

The 2-Process Model of Sleep Regulation

Sleep is controlled by two key components that keep us awake during the day and enable us to fall asleep during the night.

The two processes that control our sleep are:

Process 'C' our Circadian Rhythm (or body clock), and
Process 'S' our Homeostatic Sleep Drive

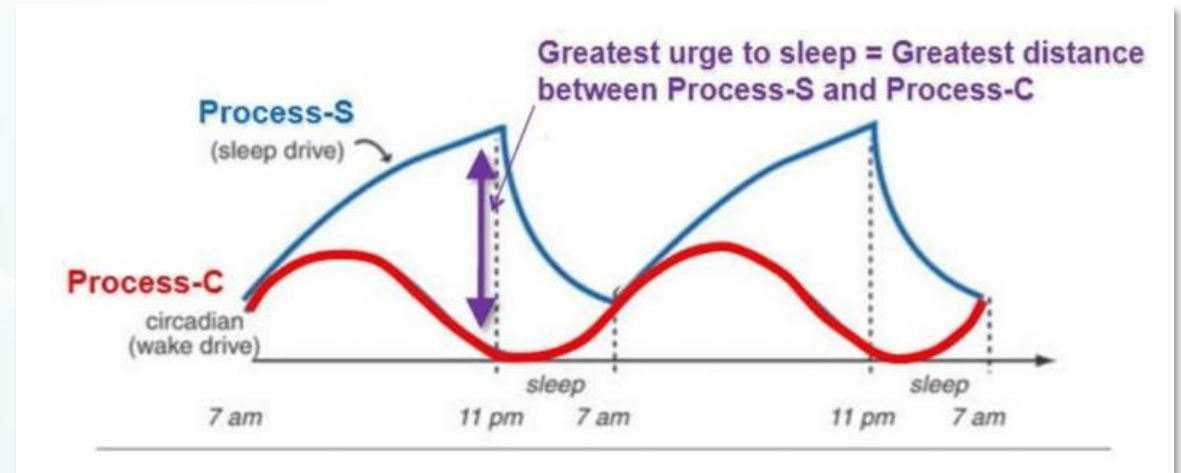




Have you found it difficult to fall asleep at night?

Try going to bed later to increase your sleep pressure.

Keep the lights low allowing melatonin levels to build along with a lowering of cortisol and your core body temperature too.





Sleep in the PKU community



European Journal of Paediatric Neurology
Volume 23, Issue 5, September 2019, pages 685-691
Prevalence of sleep disorders in early-treated phenylketonuria children and adolescents. Correlation with dopamine and serotonin status
<https://shorturl.at/goUgD>



Phenylketonuria and Sleep
March 4, 2021 by Brian Murphy, Ph.D



Tips for better sleep

If you or your child has PKU and is experiencing sleep disorders, here are some tips that may help.

<https://shorturl.at/omAwX>

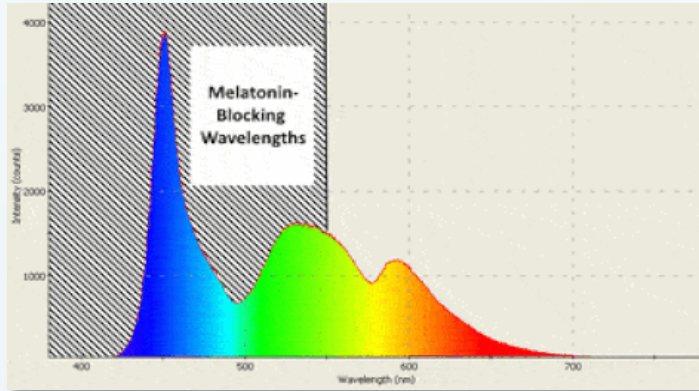


What can help?

- Keeping to a regular wake up time helps anchor our circadian rhythm.
- Exposing ourselves to early morning sunlight switches off melatonin and switches on cortisol. This is why early morning sunshine exposure helps us feel more alert, energised and ready to start our day, Early morning sunshine is nature's cup of coffee, enjoy it!
- Starting our day, this way helps us to be active increasing our sleep pressure for the nighttime.



What can help?



In the evening, melatonin naturally starts to increase with the lowering of natural light



It can help therefore to change common light bulbs in your house with amber lights which provide a nice warm relaxing atmosphere that protects you against harmful blue light.



Also, it is suggested to use low-lux amber lights or red-light bulbs for bedside lighting, as these options minimally impact melatonin production.



10 Point Sleep Plan

1 LIMIT ALCOHOL

Limit the amount of alcohol consumed and allow time for it to be metabolised by only drinking earlier in the evening.



2 THE BEDROOM ENVIRONMENT

The bedroom environment should be as “cave-like” as possible. Cool (about 18 degrees), dark, and quiet. Eliminate sources of light from windows, doors, and electronic equipment. Turn the digital clock radio away from you or place it under the bed. If you can't eliminate sources of light, consider a sleeping mask.



If you are unable to eliminate sources of noise, consider turning on a fan in the room, getting a white noise generator, or earplugs. Heavy curtains can also muffle outside noises. To cancel noise, don't use television, radio, or any source of sound that varies in frequency or volume. Use a fan for 'white noise', especially if you are a light sleeper. White noise uses a mix of sound frequencies to create a static-like sound. It can be intense and high-pitched, like a fan or an air conditioner, and remove pets from the room.

If you have a bed partner who takes up most of the duvet then adopt the Scandinavian method of separate duvets.

Scandinavian Sleep Method



Couples rarely share the same sleep preferences and habits. The Scandinavian sleep method gives each person autonomy to regulate their sleep temperature and reduce sleep disruptions at night.

3

LIMIT CAFFEINE

Limit total caffeine consumption and have none after noon. Caffeine can have a long half-life in sensitive individuals. Remember it's found not only in coffee, but tea, soda, chocolate, and OTC medications. If you're currently having more than five cups of coffee per day, consider tapering by mixing in decaf.



4

MEALTIMES

Try to maintain consistent mealtimes and avoid heavy meals late in the evening. A light carbohydrate snack in the evening may promote sleep.



5

SMOKING

If you smoke, avoid smoking heavily near bedtime and don't smoke during awakenings at night. You may inadvertently condition yourself to wake up frequently during the night.



6 LIMIT LIQUIDS

Limit all liquids during the last two hours before bedtime.



7 REGULAR EXERCISE

Regular exercise may promote deeper sleep. However, there is relative decrease in body temperature associated with sleep onset and maintenance. Therefore, you should avoid strenuous exercise within three hours of bedtime, as it will raise body temperature and disrupt sleep.



8 WARM BATH OR SHOWER

Research suggests a warm bath or shower an hour or two before bedtime can help you unwind and fall asleep faster. Why? It will help lower your core temperature, and that's a circadian sleep signal. Also let's consider how the warm water helps relax muscles and reduces pressure on the knees and joints, which allows the body to be fully supported. It increases circulation and reduces swelling and inflammation.



9 SCHEDULE "WORRY TIME"

Schedule some "worry time" in the late afternoon or early evening. Use this time to plan activities for the next day or to think about things that may cause you to feel upset, angry, or anxious. It's easy to get into the habit of thinking about worrisome things when you are in bed. It's quiet, there are no distractions, and there are no other competing activities. It's a very bad habit in terms of sleep.

Keep a pad and pencil handy, but outside the bedroom, so you can jot down ideas that seem important during the night. If you are awake enough to be aware that you are thinking of solutions to problems, you should be out of bed. Getting the ideas out of your head and onto a piece of paper may make it easier to get back to sleep.



10 TECHNOLOGY

Here is your modern-day technology challenge! Remove all technology from the bedroom other than a standard alarm clock. Your brain may just wake you up to engage with your phone/ iPad/ laptop, TV, leading to light unrefreshing sleep!





Any Questions?

