



INE Presentation

The Importance of a Good Night's Sleep

The information in this presentation is not intended to replace a one-on-one relationship with a qualified healthcare professional and is not intended as medical advice. It is intended as a sharing of knowledge and information.

I encourage you to make your own healthcare decisions based upon your research and in partnership with a qualified healthcare professional.



Sleep is vital

Sleep hygiene is vital for overall health, beyond just resting.

Quality sleep, with REM and deep sleep cycles, enhances memory, cognitive function, immune system, hormone production, weight control and mental well-being.

Poor sleep habits or sleep disorders like sleep apnea can contribute to long-term sleep deprivation.

Being awake for 17 hours is similar to having a BAC of 0.05%. Being awake for 24 hours is similar to having a BAC of 0.10%.



→ How Sleep controls your health and diet

Shift workers have a higher risk of obesity, diabetes, and heart disease due to irregular eating patterns and circadian disruption.

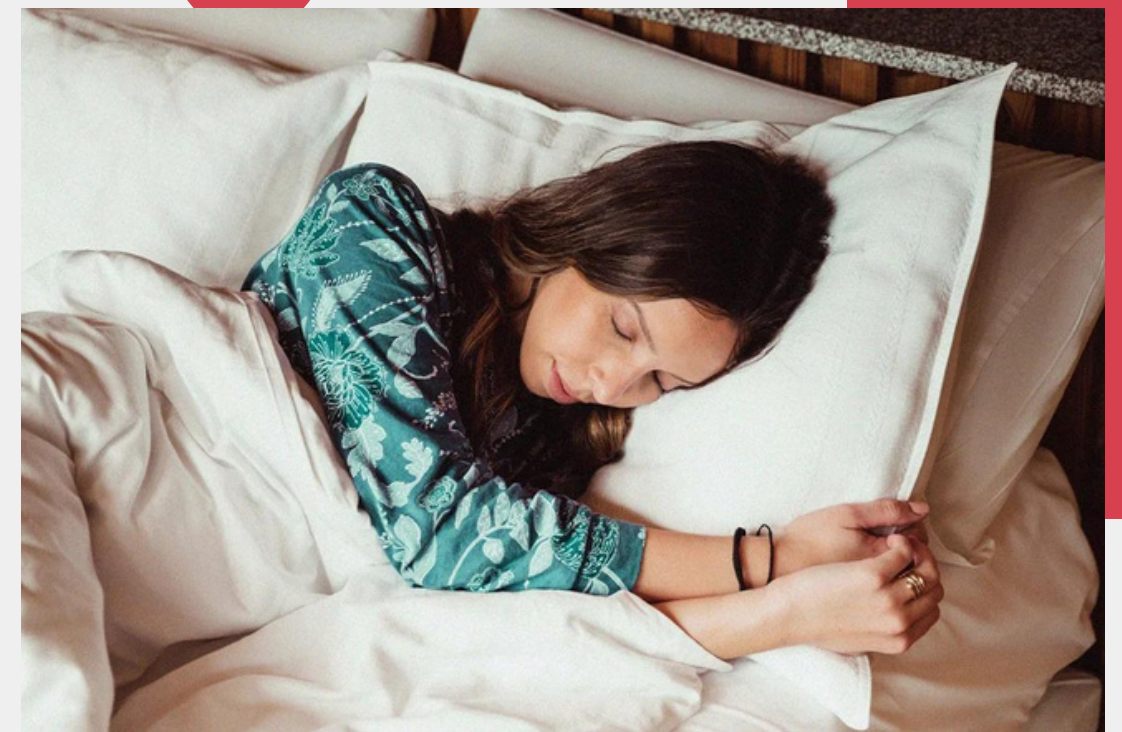
Every single cell in our body has a clock. Insufficient sleep leads to an imbalance between melatonin and growth hormone, leading to stunted growth, decreased repair, and slower healing.

Muscle growth slows down. Your 'good' cholesterol, HDL, lowers.

Lack of sleep, releases cortisol, a stress hormone that can cause havoc on the entire body.

Changes in clock genes can cause metabolic problems such as dyslipidemia, insulin resistance and diabetes

Lack of sleep has been linked to mental health declining





4 Sleep Cycles

Stage 1: A transitional state when falling asleep, characterized by a fast gamma rhythm in the brain.

Stage 2: Previously overlooked, it's a state between wakefulness and deep sleep, featuring unique characteristics.

Stage 3: Deep, slow-wave sleep. Marked by large, slow brain waves that clean and restore the brain after wakefulness.

Stage 4: REM sleep: Known for active dreaming, characterized by rapid eye movement.

These 4 stages cycle approximately every 90 minutes during a night's sleep.

Totaling 7.5 to 8 hours for optimal rest.

The 1st 105-110 minutes

The 1st deep sleep cycle triggers a significant release of growth hormone, vital for bodily functions.

Missing this phase means missing out on the surge, usually about 2 hours before midnight.



While growth hormone release is consistent overall, receiving it all at once affects the body differently than spread out.

The first sleep cycle is crucial for protein synthesis, essential for storing important memories that need extra brain space. Early sleep dreams tend to incorporate new learning or sensory experiences from the day.

As memories consolidate from the hippocampus to the cortex, dreams reflecting those memories shift later in the night.

The Party Clean Up

During sleep, synapses change, and proteins are altered, requiring ATP as energy.

In the initial sleep stages, particularly the first 20 minutes, adenosine is converted to ATP, aka "power naps."

Deep slow wave sleep clears out misfolded proteins and breaks down products from wakefulness.

Early sleep dreams often reflect new learning or sensory experiences.

Slow waves during sleep act as a cleanup crew after the wakeful "dinner party."



Neurons expand when firing and contract when resting akin to a pump, cleaning up brain debris.

This synchronized activity, aided by glial cells, helps remove brain waste.



Failure to clean up after a "party" results in a clogged environment.

This impairs movement, enjoyment, and cognition over time, likened to dinner guests struggling in a crowded space.

Sleep Allows your Brain to Detox

Glymphatic washout for your brain.

Raising your feet in bed but 3 to 5 degrees by using a pillow or raising the bed.

Be cautious if you have acid reflux, raise the head in this case.

Science is showing that sleep is critical for your brain cells to do the following:

- Detoxify Metabolic Waste
- Get Rid of Dysfunctional Neuronal Cells
- Rebuild New Neuronal Connections
- Reset the Balance of Neurotransmitters
- Improve Neurotransmitter Receptor Sensitivity

These 5 processes are key for the formation of both short and long-term memory and for smooth cognitive processing. Poor sleep is associated with brain fog and mood problems when we are young and accelerated cognitive decline when we are older.

Special nervous system cells called “glial” cells rush in to scavenge additional waste in and around the brain cells.



Brain cells perform autophagy (“self eating”), mopping up diseased and damaged bits of protein and metabolic waste.



The glymphatic system flushes out dirty fluid and molecules from inside the brain tissue through a network of pathways. Clean cerebrospinal fluid replaces it.



Lymphatic vessels surrounding the brain deliver the waste to the lymphatic system, which rids the body of toxins, waste and other unwanted material.



There's more and more REM sleep into the night

This stage of sleep is crucial and shouldn't be overlooked.

Hormone levels change, with growth hormone and melatonin declining while others increase.

Studies suggest this stage is when creativity peaks, as dreams combine old and new ideas.

Ideas are organized into meaningful collections during sleep like someone organizing the folders on your desktop by category.



The 90-minute sleep cycle is like a washing machine cycle for the brain.

Just as water and soap is added in the first part of the cycle, the brain is compared to soaking wet clothes.

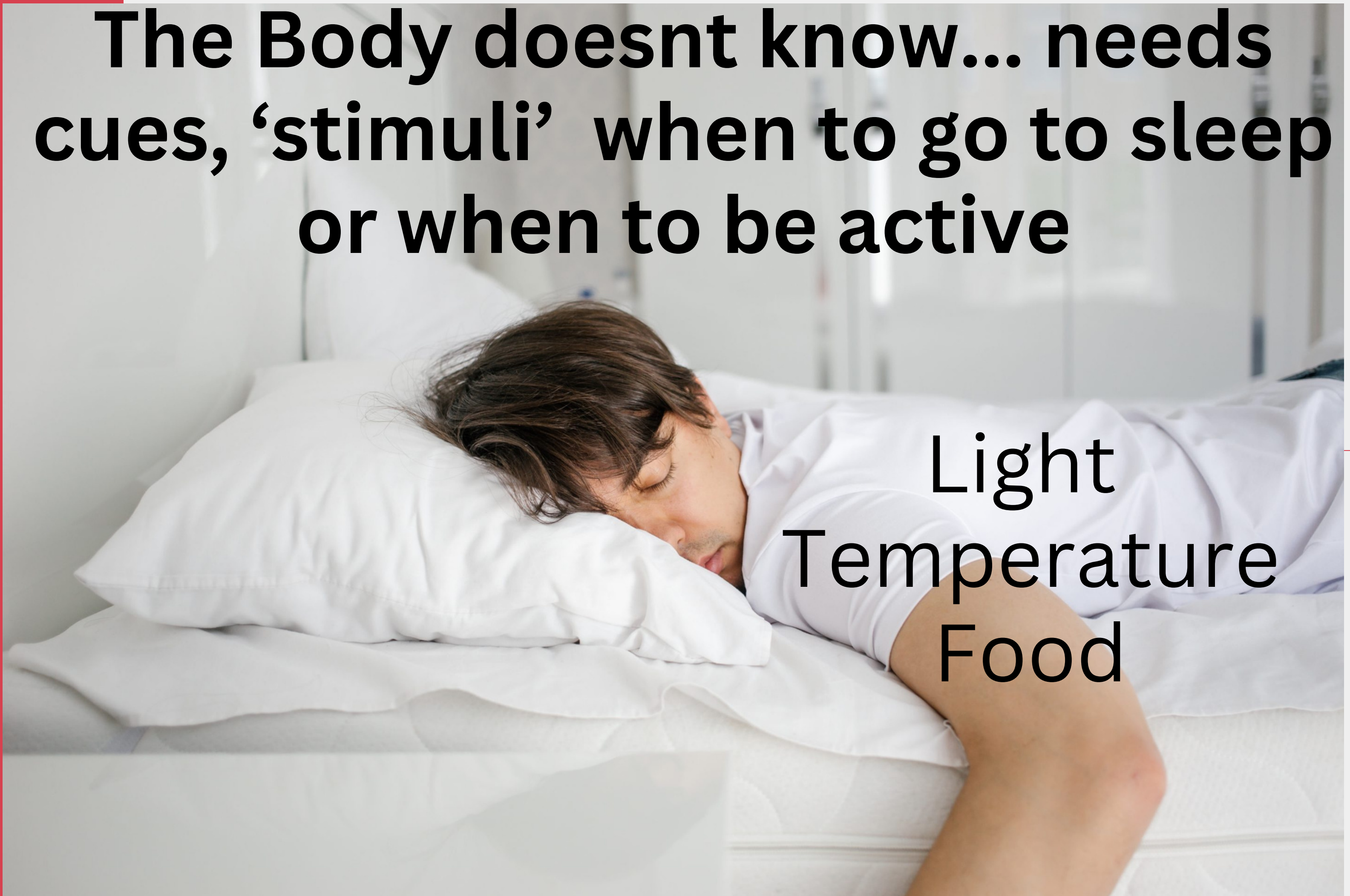
Waiting for the full cycle, including "drying," is best for brain function.

Setting a 90-minute alarm aligns with this cycle.



The Body doesn't know... needs cues, 'stimuli' when to go to sleep or when to be active

Light
Temperature
Food



How your light affects your brain

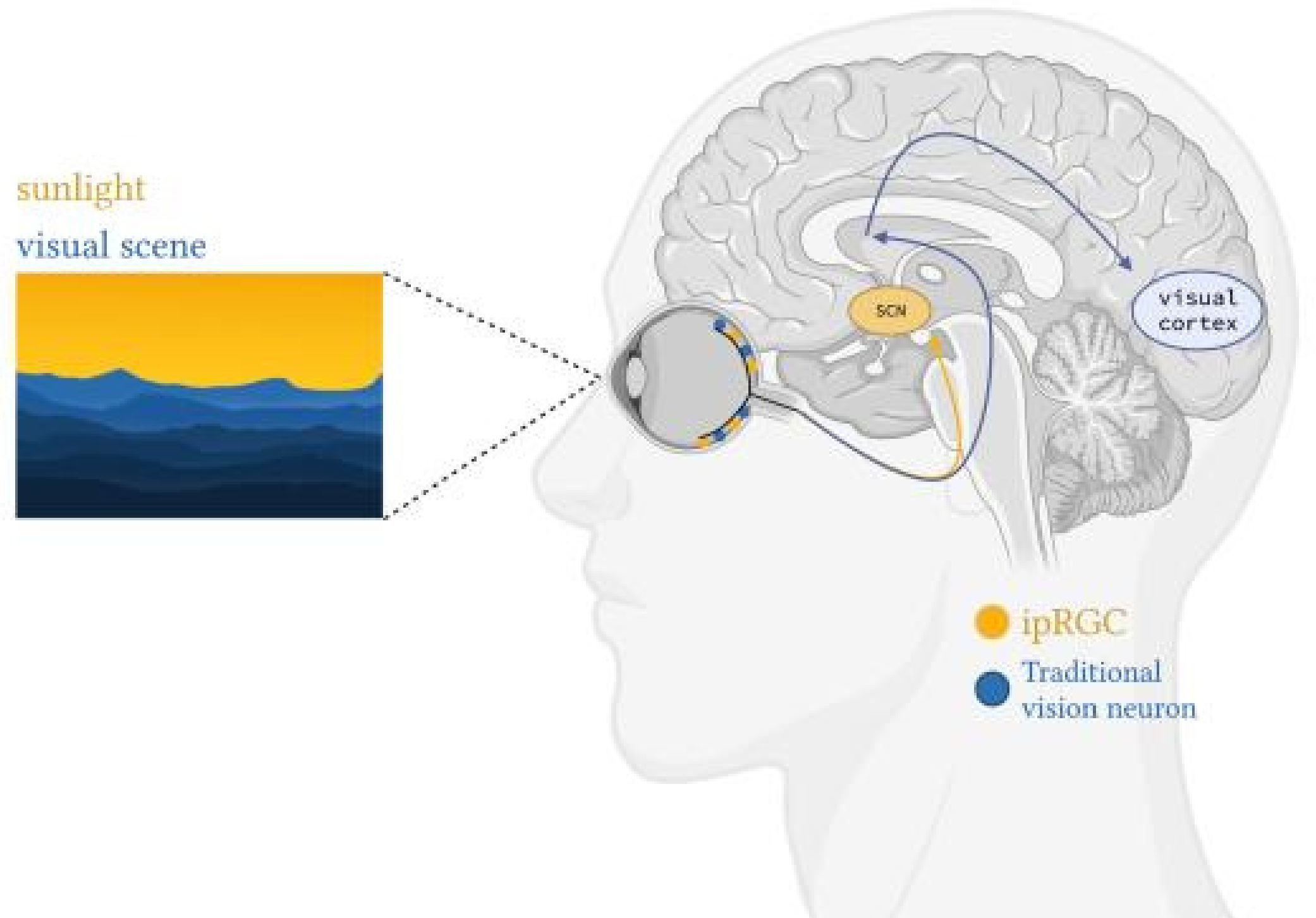
Your optic nerve communicates to your brain when the sun rises that it is morning and sets up the next 12/16 hours of your day.

At Sunset it tells your brain to prepare for sleep.

The optic nerve reads the colors yellow, red and blue.

Colors positioned on the horizon to determine when to be awake or sleep.

Watching the early morning sun triggers a hormone-release response for the next 24 hours.



Using Light and Dark regulate your Circadian Clock

Bright sunlight 30 to 60 minutes of waking up

Irrespective of cloud coverage.

Clear day 5 mins.

Cloudy day 10 mins.

Rainy day 30 - 40 mins.

No sunglasses, windows, glasses ok.

If you get up before sunrise switch on all the lights but it doesn't stimulate the same hormone response in the AM. (But it is enough light to disrupt your PM hormone response!)

Sunlamp simulators are expensive, a selfie ring light also works.

After sunset

No overhead lights.

Dim lamps.

Avoid bright screens.





Temperature

Cool promotes sleep.

Sleep in a cool/dark room.

Use layers of blankets you can pull off if you get too warm.

Towards dawn, your temperature rises causing you to wake up.

1 - 3 min cold shower/ ice bath increases core temperature

Releases dopamine, adrenaline and epinephrine from your adrenals and your brain.

Exercise will make you more alert

In a healthy body the highest amount of cortisol is released in the AM for mental sharpness and get you to move your body.

Ideal time

First thing in the morning.

3hrs after waking.

11hrs after waking. (but give yourself at least 2 hours before bedtime.)

Food affects your Circadian Rhythm

Eating times, especially regular meals, impact insulin, leptin and ghrelin levels and your metabolic health.

Internal clocks control daily routines and sync them with eating habits.

Eating food when you wake up, releases adrenalin causing body temperature to go up.

Eat a breakfast containing protein.

Reduce intake of starchy carbohydrates.

Stick to 2 / 3 meals a day; no snacking.

Allow 5 to 6 hours between meals.

Eat slowly and mindfully.

Avoid eating after dinner.

Stop eating 3 to 4 hours before bed.

The Importance of Routine for Your Circadian Rhythm

Consistent bedtime and waking time.

Try to only deviate bedtime / wake up time, one hour if you have too.

If you are sleep deprived taking a nap not too late in the day 25 to no longer than 90 minutes.

Have a relaxation / winding down protocol before bedtime.



Sleep Apnea

Bouts of suffocation, lack of oxygen during sleep

Unlike snoring which is the hoarse or harsh sound that occurs when air flows past relaxed tissues in your mouth.

Sleep apnea is a condition where the upper passages of your airway close off, interrupting your breathing and depriving you of oxygen until you wake and start breathing again.

Associated with cardiovascular issues, sexual dysfunction and cognition

Learn to be a nose breather

Sleep with mouth tape

Do cardiovascular exercise with water in your mouth without swallowing or mouth tape

Feels challenging at first but after your airways become dilated over time it is quite calming and sustains your workout



Caffeine



Caffeine occupies receptors of adenosine.

Adenosine is the reason we get sleepy. The longer we have been awake the more adenosine builds up.

People who say they can fall asleep after a dinner coffee are still getting sleep disruption.

Consider if you have DNA SNPs that can't process caffeine.

If you are going to have coffee choose organic/small batch.

Yerba Matte (unsmoked variety.)

Organic green tea.

To avoid afternoon crash delay drinking caffeine 90 to 120 mins in the AM to detox from yesterday's leftover adenosine.

Avoid 8 to 10 hours before bedtime.

Melatonin is a Hormone

Over-the-counter melatonin widely varies in potency and miss-labeling.

The amount our body makes is much smaller.

Interacts with many other hormones and causes disruption.

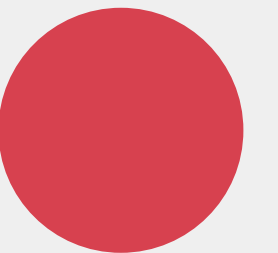
For example estrogen and testosterone. Studies show that animals' gonads shrink after receiving melatonin.

Helps put you to sleep but not stay asleep throughout the night.

Ok to use now and again for example jet lag.

Alternative to prescription sleeping pills.

Studies show only sedates you, not real REM sleep.



Sleep Aids

Following a healthy routine, most people do not need supplements however you could try 30 - 60 minutes before bedtime. Try one or two for a month and monitor how they affect you slowly.

Mangeseuim Theonate

However, studies show people who have insomnia are deficient in magnesium
May cause digestive issues in some people.

Apigenin (Derivative Chamomile)

Theanine

May cause vivid dreams that might disrupt a good night's sleep.
Avoid if you sleepwalk/have *night terrors*.

Glycine

GABA

Kiwifruit with skin on has been shown to have a GABA like effect on receptors.

Look for homeopathic sleep aid alternatives.



Deep Relaxation and Self Hypnosis

Yoga Nidra or yogic sleep

A state of consciousness between waking and sleeping, typically induced by a guided meditation.

Non Sleep Deep Rest - NSDR

A state of rest that is similar to deep sleep but without actual sleep. It is a practice that promotes profound relaxation and rejuvenation.

Can be used throughout the day.

Great for shift workers/ jet lag.

Youtube and audio books.



References

Oliver Cameron Reddy and Ysbrand D. van der Werf* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7698404/>
<https://www.hubermanlab.com/newsletter/toolkit-for-sleep>
<https://www.barnesandnoble.com/w/why-we-sleep-matthew-walker-phd/1125897958>
James Nestor Breath: The New Science of a Lost Art
<https://www.unstoppablehealthcommunity.com/>
[https://www.cell.com/current-biology/fulltext/S0960-9822\(17\)30504-3?
_returnURL=https://linkinghub.elsevier.com/retrieve/pii/S0960982217305043?showall%3Dtrue](https://www.cell.com/current-biology/fulltext/S0960-9822(17)30504-3?_returnURL=https://linkinghub.elsevier.com/retrieve/pii/S0960982217305043?showall%3Dtrue)
<https://www.nhlbi.nih.gov/health/sleep-apnea>
<https://www.hubermanlab.com/episode/sleep-toolkit-tools-for-optimizing-sleep-and-sleep-wake-timing>
<https://www.pennmedicine.org/updates/blogs/health-and-wellness/2019/december/is-your-snoring-really-sleep-apnea>
<https://www.sciencedirect.com/science/article/abs/pii/S2468867319301609>
<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001571>
The Sleeping Brain: Harnessing the Power of the Glymphatic System through Lifestyle Choices
<https://pubmed.ncbi.nlm.nih.gov/11455362/#:~:text=CONCLUSIONS%3A%20Our%20results%20suggest%20that,pineal%20gland%20and%20the%20testes.>
<https://pubmed.ncbi.nlm.nih.gov/32075959/>
<https://www.nature.com/articles/s41598-019-52352-w>
<https://www.nature.com/articles/s42003-023-04598-4>
<https://pubmed.ncbi.nlm.nih.gov/28585194/>
https://www.youtube.com/playlist?list=PLPNW_gerXa4P6-7EC4twzLBjR22rQYk3u
<https://bri.ucla.edu/people/gina-poe-ph-d/>