



The Power of Sleep

Sleep is our Secret Weapon! Sleep is the greatest, legal performance-enhancing drug that is available.” –Matthew Walker, PhD

1. Diaphragmatic Breathing and Heart Rate

2. Quality Sleep = Foundation for Well-Being

General sleep recommendations based on age ¹	
Newborns (0–3 months)	14–17 hours
Infants (4–11 months)	12–15 hours
Toddlers (1–3 years)	11–14 hours
Preschoolers (3–5 years)	10–13 hours
School-aged children (6–13 years)	9–11 hours
Teens (14–17 years)	8–10 hours
Adults (18–64 years)	7–9 hours
Older adults (65 years and older)	7–8 hours

Sleep in America Poll 2018: “The silent sleep loss epidemic is one of the greatest public health challenges we face in the 21st century,” Matthew Walker, PhD

How many hours of sleep should I be getting every night? _____

How do I know if I am getting enough sleep? Ask yourself:

- Am I sleepy during the day?
- Do I fall asleep unintentionally while watching TV, a movie or while you’re a passenger in a car?

3. Did You Know?



- i. 1 out of 2 adults sleeps less than 8 hours per night. The average American sleeps **6 hours and 30 minutes** each night.
- ii. In the past 100 years we have **decreased our sleep by 20 %**.
- iii. After 20 hours of being awake you are as **impaired** as if you were **legally drunk**.
- iv. **Drowsy driving** kills more people than alcohol and drugs combined!
- v. Men who are sleeping 5 hours or less a night will have a level of **testosterone** that of 10 years their senior
- vi. One night of only 4 hours of sleep causes **immune deficiency**.
- vii. **Shift workers** have higher rates of **type 2 diabetes, obesity, and cancer**. The World Health Organization now classifies any form of **shift work as a probable carcinogen**.
- viii. Poor Quality sleep, sleep debt, and sleep disorders are all linked to shorter telomeres!

4. Why We Sleep?

- i. We spend **1/3 of our life** in a state of unconscious sleep – **Must be important!**
- ii. Restoration. Rejuvenation. Muscle Growth. Tissue Repair. Sleep synthesizes hormones and Cleans up and Dumps toxic buildups.
- iii. **Solidify and consolidate memories**. Overnight bits of information are transferred to long term memory
- iv. **Preservation** – anthropologically sleeping once sun went down kept us safe from nocturnal animals

5. Two internal biological mechanisms

- i. **Circadian rhythms (Body Clock)**: Direct daily fluctuations in wakefulness, body temperature, metabolism, and the release of hormones. They control your timing of sleep and cause you to be sleepy at night and your tendency to wake in the morning without an alarm. Circadian rhythms synchronize with environmental cues. Present or remembered.
- ii. **Sleep-wake homeostasis (Sleep Tracker)**: The homeostatic sleep drive tells the body to sleep after a certain time and regulates sleep intensity. This sleep drive gets stronger every hour you are awake and causes you to sleep longer and more deeply after a period of sleep deprivation.

6. How do I know if my internal clock is working? Ask yourself:

- i. Do I struggle to wake up and feel alert in the morning?
- ii. Am I wide awake at bedtime?
- iii. Do I feel hungry at strange hours?



7. ***If you answered yes to any of those, you may be suffering from a dysregulation in the brain structure known as the suprachiasmatic nucleus or SCN.***

- i. The SCN, located in the hypothalamus, is a tiny structure made up of about 50,000 cells. This delicate bunch of cells is your body's central internal clock!
- ii. The SCN tells you when to be hungry, when to be tired, when to feel alert, and drives cellular/DNA repair overnight.
- iii. The SCN is highly sensitive and sleep hygiene plays a role in keeping it in tip top shape.
- iv. When the SCN is working well, you feel well.
- v. *Reference: The Telomere Effect, pages 188-205*

8. ***Types of Sleep***

- i. **REM Sleep-- rapid eye movement (REM) sleep:** First occurs about 90 minutes after falling asleep. Eyes move rapidly from side to side. Mixed frequency brain wave activity becomes closer to that seen in wakefulness. Your breathing becomes faster and irregular, and your heart rate and blood pressure increase to near waking levels. This is Dream sleep.
- ii. **Non REM Sleep which has four different stages:**
 - Stage 1:** Light sleep – Heart rate and breathing begin to slow.
 - Stage 2:** Middle stage -- You come in and out of stage 2 most frequently. Breathing and heart rate continue to slow and body temp drops.
 - Stage 3:** Deep Sleep/Short Wave – Needed to feel refreshed.
 - Stage 4:** Deep Sleep/Short Wave – Non-dreaming sleep.

9. ***The Power of REM Sleep***

- i. REM SLEEP IS RESTORATIVE SLEEP.
- ii. While in REM sleep our body suppresses cortisol and our metabolic rate increases.
- iii. When we have poor sleep, we get less REM sleep the second half of the night.
- iv. Less REM sleep results in higher levels of cortisol and insulin. These high levels increase our appetite and can lead to greater insulin resistance lasting many hours, even into the next evening.

ONE BAD NIGHT SLEEP CAN THROW YOU INTO A TEMPORARY PREDIABETIC STATE!

Reference: Walker, Matthew, PH.D. Why We Sleep: Unlocking The Power Of Sleep and Dreams

10. ***What Can Negatively Impact REM Sleep?***

Copyright © 2020 Allison Hull, D.O. This information may not be duplicated or reproduced in any way without written permission of Dr. Allison Hull.



- i. **Alcohol** reduces overall REM sleep and delays first cycle of REM sleep
- ii. **Nicotine** reduces overall REM Sleep
- iii. **Poor Diet, Caffeine**
- iv. **Not enough Physical Activity**
- v. **Stress and Depression** lead to decreases, disruptions and delays in REM Sleep cycles

True or False? Alcohol Increases overall REM sleep and expedites first cycle of REM sleep.

11. Let's Talk About Sleep Aids: Are They Safe and Effective?

- i. **Benadryl (Diphenhydramine)** – long term use associated with memory loss.
- ii. **Melatonin**- not an herb, but rather a hormone secreted from the pineal gland of an animal. No long-term safety data.
- iii. **Ambien (Zolpidem)** – black box warning
- iv. **Lunesta (Eszopiclone)**-- black box warning
- v. **Trazadone (SSRI therapy)** – probably safest sleep aid
- vi. **Restoril/Xanax/Ativan/Clonazepam-(Benzodiazepines)**-- risk for dependency
- vii. **Doxepine (Silenor)** - used for secondary insomnia-- not very effective

12. Sleep and Weight Regulation

- i. Decreased sleep suppresses **leptin** (fullness hormone) and increases **ghrelin*** (hunger hormone) and **GLP-1** (hunger hormone*).
- ii. If a person sleeps only 5-6 hours a night they will **eat 200-300 calories more** each day (gain 10-15 pounds each year). They will also choose more unhealthy foods.
- iii. If you are dieting but not getting adequate sleep **17 % of your weight loss will be muscle.**
- iv. There are no **nutritional supplements** that make up for inadequate sleep.
- v. **Bottom line: If you want to lose weight sleep!!**

13. Sleep and Weight Regulation - Leptin

- i. Leptin is a **hormone** produced by **adipose cells and intestinal cells.**
- ii. Leptin acts on the Hypothalamus to **trigger satiety.**
- iii. **Low levels of Leptin or Leptin Resistance** contribute to **persistent hunger and obesity.**
- iv. **Obesity can lead to Leptin Resistance.**



- v. **Sleep Deprivation can lead to a reduction in Leptin.**
- vi. A study found that a **20% reduction in Leptin** can lead to a **24% increase in appetite** drawing people to **consume more processed carbohydrates/sugars/starches.**

Reference: Perlmutter, David, MD; The Grain Brain

14. Lack of Sleep: Men vs Women

Poor or Inadequate Sleep Results in...

- i. Men see an increase in **Ghrelin**.
Ghrelin is the **“hunger hormone”** produced in the gastrointestinal tract.
 - 1. Acts on the **hypothalamus** to increase hunger.
 - 2. Increases **gastric acid secretion and gastrointestinal motility** to prepare the body for food intake.
 - 3. Plays an important role in **Reward Cognition** due to its relationship with Dopamine.
- ii. Women see a decrease in **GLP-1 (Glucagon like Peptide)**.
GLP-1 is produced in **intestinal cells**.
 - 1. Slows down gastric emptying to create **satiety**.
 - 2. Communicates with the Hypothalamus to reduce **hunger**.
 - 3. Lowers **Blood Glucose levels**.

Reference: Perlmutter, David, MD; the Grain Brain

15. Sleep and Telomere Health

- i. Chronic insomnia is linked to shorter telomeres.
- ii. Telomeres like at least 7 hours of quality sleep with consistent sleep and wake times.
- iii. Longer sleep = longer telomeres.
- iv. Quality sleep also protects the telomeres in your immune system, specifically the CD8 cells.
- v. Healthy, young CD8 cells vigorously attack invaders. When they grow old or the telomeres shorten, they are less likely to defend you- welcoming illnesses and systemic inflammation!!

Reference: The Telomere Effect, pages 188-205

16. Just How Important Is Sleep?

- i. Sleep determines how we Eat, Think, Feel, Weigh, Metabolize, Fight Infections, Prevent and Manage Disease, Create, Learn, Store Memories, and Cope with Stress. We CAN improve our sleep!



Reference: Perlmutter, David, MD; *The Grain Brain*

True or False, Poor and inconsistent sleep will shorten our telomeres?

Answer: _____

17. How Do We Harness This Power of Sleep?

Sleep Hygiene Checklist

- i. **ONE hour** before going to bed, turn **OFF** sources of stimulation and **ON** sources of relaxation.
- ii. Establish a **ritual/routine** so your body knows it time to sleep.
- iii. Keep regular **sleep schedule**. (same bedtime, same wake time, everyday)
- iv. **Exercise** regularly for at least 20 minutes, preferably 4-5 hours before bedtime.
- v. Sleep space: Adjust **bedroom environment** (dark, quiet appropriate temperature, etc.). **NO tvs, phones or computers in bedroom.**
- vi. Clear your mind: Find ways to relieve stress, **jot down “to-do” or worries** at least an hour before bedtime to **clear your mind.**
- vii. Bed is for **sleep and intimacy ONLY.**
- viii. Avoid **napping.**
- ix. Avoid **caffeinated beverages** after lunch.
- x. Avoid **alcohol** near bedtime: no “night cap to relax”.
- xi. **Get up and try again:** If not sleeping after 20 minutes, get up and do something calming (not stimulating) until tired and then go back to bed.
- xii. **No clock-watching.**
- xiii. Consider a **sleep diary** to help make sleep a priority.
- xiv. Bed is for sleep and intimacy **ONLY.**

Sleep Diary		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
 Complete in the MORNING								
I went to bed last night at (time):								
I got up this morning at (time):								
I slept for a total of (hours):								
I woke up during the night at (time):								
 Complete in the EVENING								
Number of caffeinated drinks today:								
Time of last caffeinated drink:								
Exercise completed today (minutes):								
What I did in the hour before I fell asleep:								
Mood today? (1=awful, 10=great):								

PSYCHOLOGY TOOLS © 2018 <http://psychologytools.com>

18. What about the Sleep environment?

- i. Half of your brain **doesn't sleep well** when you are in a **different sleeping environment** (i.e. a hotel room).
- ii. **Add a subtle fragrance.** Essential oil diffusers with sleep promoting lavender, cedar wood, sandalwood
- iii. Ideal bedroom: **Cool (60-67 degrees)** Dark and uncluttered.
- iv. Light bulbs suppress **melatonin release**. Use a dimmer or desk light and **low blue light bulbs**
- v. Light from **electronic devices** delays melatonin release (1 study revealed 1 hour of iPad time delayed melatonin release by 3 hours, decreased peak release by 50 %, and decreased REM sleep).

What are 3 Sleep Hygiene rules?

Answer: _____

WHAT IF I STILL CAN'T SLEEP?

19. What is Obstructive Sleep Apnea (OSA)?

- i. OSA is defined as **intermittent airflow blockage during sleep**.
- ii. Breathing repeatedly stops and starts again during sleep.
Apnea = Breath Holding
- iii. The Obstruction occurs when your **airway is compromised** during sleep.
- iv. The OBSTRUCTION of your airflow can occur due to...



- i. **Excess weight** from the habitus of our neck
- ii. An **oral anatomy** which results in a **low lying palate and large tongue**
- iii. **Enlarged Tonsils**
- iv. **Deviated Septum**
- v. Our **sleep position and neck positioning** during sleep can exacerbate the issue

20. What are Signs of Obstructive Sleep Apnea (OSA)?

- i. Excessive Snoring
- ii. Daytime sleepiness
- iii. Waking up and gasping/choking
- iv. Breath holding
- v. Dry mouth
- vi. Morning headache
- vii. Poor concentration
- viii. Irritable Mood/Depressed Mood
- ix. Nighttime sweating
- x. Poor Libido
- xi. Elevated Blood Pressure
- xii. Difficulty with weight loss

21. What Defines Obstructive Sleep Apnea OSA?

- i. **Apnea** is defined as breath holding x 10 seconds or more.
- ii. **Hypopneas** (partial obstruction of airway) areas measured as oxygen desaturation of 3% or more or arousal from sleep.
- iii. The **Apnea-Hypopnea Index** is calculated by adding all the apneas and hypopneas and then dividing by total sleep time.
- iv. An **Apnea-Hypopnea Index of 15** or more events per hour, or **5 or more events per hour in the presence of symptoms is diagnostic for OSA.**

Reference: Semelka, Michael, DO; Diagnosis and Treatment of OSA in Adults; American Family Physician, 2016 Sept 1; 94(5):355-360

22. How is Obstructive Sleep Apnea (OSA) Diagnosed?

- i. OSA is diagnosed with a **sleep study.**
- ii. Sleep Study = Polysomnography.
- iii. A Sleep Study monitors:

- Heart Rate
- Oxygenation
- Breathing Patterns/Apnea episodes
- Brain Activity (to confirm the apnea is obstructive and not central)
- Arm and Leg movements

23. What are some of the Consequences of Obstructive Sleep Apnea (OSA)

- i. Hypertension
- ii. Coronary Artery Disease
- iii. Cardiac Arrhythmias
- iv. Shorter Telomeres
- v. Increased risk for Dementia
- vi. Pulmonary Hypertension
- vii. Polycythemia Vera (increased Red Blood Cell production)
- viii. Chronic Fatigue
- ix. Depression

24. (OSA) – Who is at risk?

- i. 2-14% of population
- ii. **Men are 3x more likely than Women**
- iii. More common over the age of 60
- iv. Body Habitus (**Large Neck Circumference**)
- v. **Oral and/or Facial Anatomy**
- vi. **Diabetics**

25. How is OSA treated?

- i. Weight Loss if Body Habitus is the Cause**
- ii. Continuous Positive Airway Pressure (CPAP)
- iii. Oral Appliance Therapy
 1. Mandibular Advancement Device
 2. Tongue Retaining Device * (insufficient evidence)
- iv. Surgery
 - Tonsillectomy



- Septoplasty
- Uvulopalatopharyngoplasty
- Maxillomandibular Advancement
- Tongue Reduction
- v. Surgical implantation of Neurostimulators to stimulate the airway muscles through activation of the hypoglossal nerve

Reference: Semelka, Michael, DO; Diagnosis and Treatment of OSA in Adults; American Family Physician, 2016 Sept 1; 94(5):355-360

What is OSA? What are consequences of OSA? What are some treatment options?

Answer: _____

Another Sleep Solution Option:

Cognitive behavioral therapy for insomnia (CBTI)

Scientifically proven, highly effective way to end insomnia without relying on medications.

- Typically 4-6 sessions.
- Can Help people who:
 - Have difficulty falling asleep
 - Difficulty staying asleep
 - Find Sleep unrefreshing
- More than just sleep advice. You will learn to develop healthy and effective sleep behaviors and skills to help calm the mind, manage stress, and ease into a restful night's sleep.
- Available through trained LMHC/Providers.

This Week's COGNITIVE Action Plan:

- Aim for at least **7-8 hours nightly**. Utilize the sleep hygiene techniques to master your plan.
- Set a **Timer** to go to bed on time every night. Listen to the Timer!
- Practice Stress Resiliency.



- v. Reevaluate your urgent and important To-Do list.
- vi. Reframe stressor as opportunities for growth and Seek self-compassion.

This Week's Nutritional Action Plan:

- i. Fast for minimum of 16 hours
 - i. Do not eat past dinner.
 - ii. Try to eat dinner at least 2-3 hours before going to bed.
 - iii. If you are diabetic and require insulin, please do not exceed 12 hours of fasting at this time.
 - iv. Remember... If you are on BP reducing medications or diabetes medications, please monitor your BP and BG levels closely and communicate with your physician if dosing changes are needed.

This Week's Nutritional Action Plan Continue to:

- vii. **Follow the Macronutrient Ratio Goals.**
 - Low-Carb: Carbs 15%, Fat 60%, Protein 25%
 - Ketogenic: Carbs 5%, Fat 70%, Protein 25%
- viii. **Follow your Foundational Macronutrient Serving goals (either track).**
 - Get 6-8 servings of non-starchy vegetables per day.
 - Get 5-6 servings of healthy fats per day.
 - Get 4-6 servings of protein per day. Your specific goals are determined by your ideal body weight.
- ix. **Weigh, Count, Measure, Track all your Food.**
- x. **Consume at least 80-100 fl.oz. of water daily.**
- xi. **Monitor your Micronutrient Goals.**
 - i. Sodium – 3,000-7,000 milligrams per day (1-2 teaspoons of salt or 1 cup of chicken broth)
 - ii. Potassium – 3,000 -4,700 milligrams per day
 - iii. Magnesium – 400 mg per day
- xii. **Remember, you MUST get 12-15 gm of carbohydrates from green/plant sources.**



The Power of Sleep

What are 3 benefits of adequate sleep?

What are 5 strategies I can use to improve my quantity and/or quality of sleep?
