

Lindner Center
of HOPE |  Health™

Turn off the Faucet!!

The Impact of Caffeine, Sleep, and Nutrition on Anxiety and Depression

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Housekeeping

No disclosures
&
Slides available

Who am I

- Bachelor of Science in Nursing from The Ohio State University
- Master of Science in Nursing from Eastern Kentucky University
- Nationally Board Certified in Psychiatry, licensed in Ohio
- Nurse Practitioner at Lindner Center of HOPE
- Early part of my career was spent in sleep medicine
- Certification in Nutritional Psychiatry from Massachusetts General Hospital (teaching hospital of Harvard Medical School)

Objectives

- ❑ Understand the effect of caffeine and its effect on anxiety and sleep quality
- ❑ Understand how poor quality and quantity of sleep effects moods and resilience to stressors
- ❑ Understand how food choices effect not only physical health but also mental health and stability.



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Lifestyle

- **Sleep**
- Exercise/Movement
- **Diet** and appetite
- Spiritual Connectivity/Mindfulness
- Social/Relationship Connectivity
- Hobbies
- Work Schedule
- Financial Difficulties/Debt
- Social media/Internet
- **Caffeine**
- Alcohol
- Tobacco/Vaping
- Marijuana
- Other Illicit Substances

Caffeine

- Part of Chinese medicine since 1000BC
- Around for 1500 years in Arab world –*kahve* – loosely translates into ‘wine of Araby’
- Arrived in Europe in the 1650, right as the Enlightenment/Age of Reason is kicking off – boiling or fermenting water
- We’ve been giving it to soldiers since at least the Civil War.
- Water may have become marginally safe in the mid 1800’s, but the wide availability of coffee and tea coincided with steam engine, electric light bulb, shift work – and caffeine to keep us awake and focused and working
- “Coffee Break” becomes part of the vernacular post WW2.

Caffeine

- SleepFoundation.org online survey, September 2023
1,000 participants in the United States, 16yrs and older:
 - 94% of surveyed U.S. adults drink caffeinated beverages, with 64% of them drinking them daily.
 - 51% most often enjoy coffee, with soda (28%), tea (10%), and energy drinks (7%) following in popularity.
- National Health and Nutrition Examination Survey (NHANES)
6000 Americans 2003-2012, 20yrs and older
 - An estimated 75% of the US population drinks coffee, 49% reported drinking coffee daily.
 - Prevalence did not vary by sex, education, income, or self-reported general health.

Caffeine

- Caffeine's primary mechanism of action is on all four adenosine receptor subtypes (A1, A2A, A2B, A3). Specifically, blocking of A2A receptor is responsible for the wakefulness effects of caffeine.
- The mean half-life of caffeine in healthy individuals is about 5 hours. However, caffeine's elimination half-life may range between 1.5 and 9.5 hours.
 - 200mg noon = 50mg 4am

Caffeine

- Starbucks Americano Venti (20oz) has 300mg before adding any extra espresso shots.
- Dunkin' cold brew medium (24oz) 260mg
- Folgers Classic Roast (16oz) 187mg or a full 80oz pot 935mg
- Coca-Cola—regular or zero sugar 45mg 16oz
- Diet Coke – 61mg 16oz
- Twinings Green Tea K-cup ~35 mg 8oz
- Twinings English Breakfast Black Tea K-cup ~60 mg 8oz
- 24oz Monster 244mg
- 12oz Celsius 200mg
- 5-hour Energy Regular Strength 200mg (1.9oz)
- NoDoz pills 200mg
- HERSHEY'S KISSES Brand Milk Chocolates (9 pieces) 10mg
- HERSHEY'S KISSES Brand SPECIAL DARK Mildly Sweet Chocolates (9 pieces) 20mg
- **The FDA estimates toxic effects, like seizures, can be observed with rapid consumption of around 1,200 milligrams of caffeine**

Caffeine

- Effects generally
 - Caffeine use has a protective effect against cognitive impairment/decline
 - Caffeine improves what “spotlight” consciousness (single focus, reasoned thinking); As opposed to “lantern” consciousness (less focused, broad attention, wandering – common with children)
- Depression
 - Mild boost in mood
 - But there is a leveling off and a greater degree of variability in the response after **300mg**
- Anxiety
 - Differences exist in how individuals respond, but most of the research indicates that beyond **400mg** is where the trouble starts
 - Increased anxiety
 - ~50% of patients experience increased panic attacks

Caffeine

- **What does caffeine do to sleep?**
 - Increased wakefulness, poor efficiency
 - Reduced stage 1 and 2 sleep
 - Reduced duration of slow wave (stages 3 & 4)
 - Caffeine had no direct effect on REM sleep

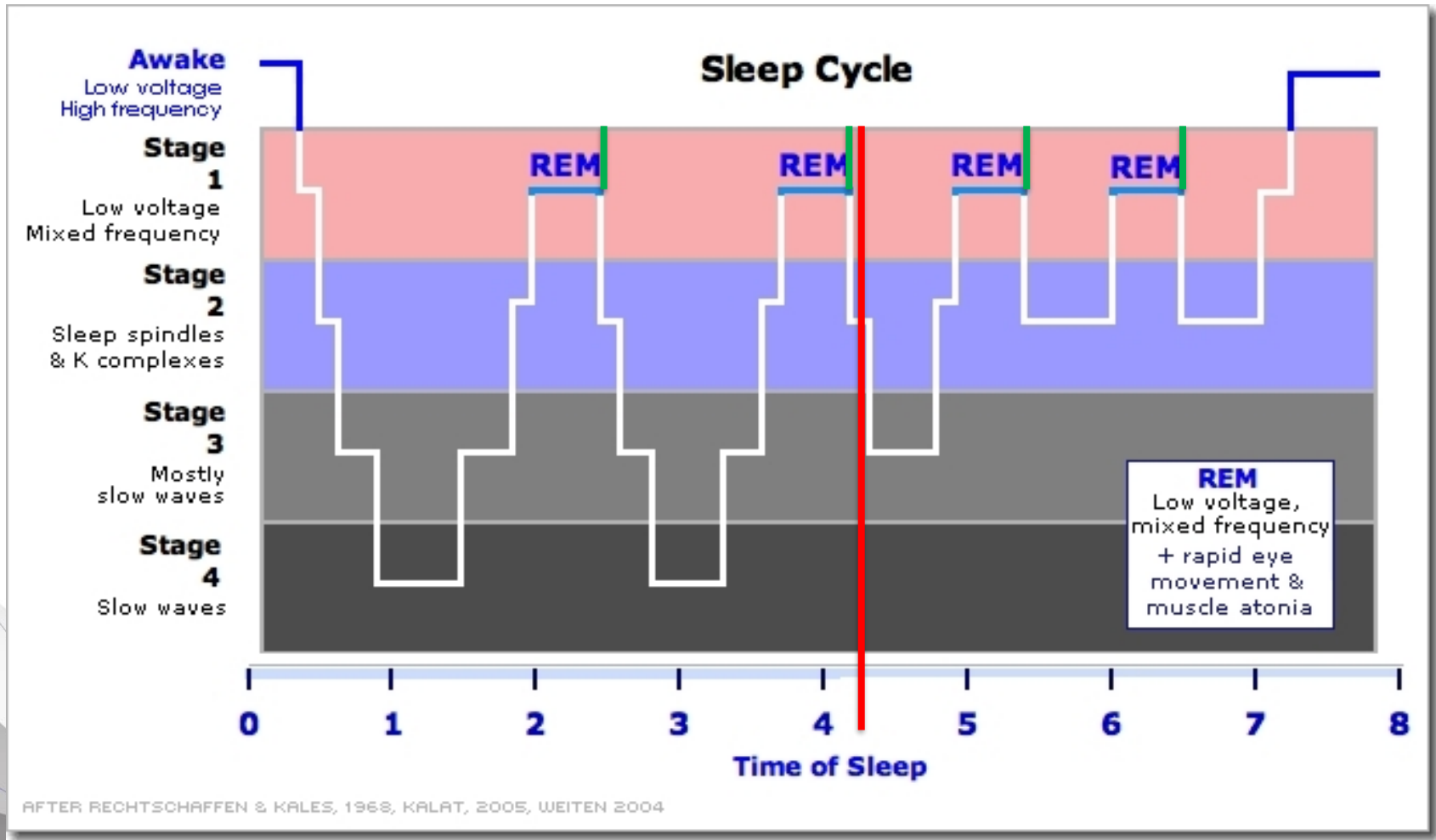
Caffeine

- **Recommendations - what I tell my patients**
 - For healthy adults, the FDA recommends 400mg a day as an amount not generally associated with dangerous, negative effects.
 - 400mg by noon
 - Any indication of anxiety or insomnia, 200mg by 10am
 - Need to cut back? Do it in steps, stopping quickly may be uncomfortable

Sleep

- In 1937 Alfred Lee documents what is now known as non-REM sleep. He divided sleep into 5 stages of increasing depth from A through E
- Discovery of rapid eye movement (REM) sleep in 1953
- Allan Rechtschaffen
 - describes the first sleep disorder in 1963 – narcolepsy.
 - Sleep deprivation experiments in rats (1989)
 - Metabolically dysregulated – increased appetite
 - Developed skin lesions
 - GI tract erosions – ulcers, diarrhea
 - Core body temperature dysregulation
 - Immune system dysfunction – rats died of sepsis
- Board certification of practitioners (1978) and the establishment of formalized fellowship training programs (1989). 88 different sleep disorders.

Typical Sleep Cycle



Effects of Age on Sleep

- Typical “normative” adults need around 7-8 hours
- Older adults: tend to have increasingly fragmented sleep, more sleep apnea (post menopausal women = men), and less slow wave sleep*
- Teens/emerging adults.....

Sleep

- Circadian Rhythm: internal clock – plants and animals all possess this
 - Specific area of the brain that controls this (suprachiasmatic nucleus) along with a number of proteins (TIM, PER, CLOCK, & BMAL1)
 - Light is the dominant synchronizing input
 - Pineal gland - melatonin synthesis controlled by detection of light
- Adolescents/Emerging Adults: need 9-10 hours of sleep (“yeah – right, dude”) coupled with a 25 hour circadian rhythm

Light is the dominant synchronizing input

- Evening
 - Turn off phone, laptop, tablet, and tv.
 - Turn down/off the lights in the house.
 - Rediscover books, magazines, comic books, audiobooks, music, coloring books
- Morning
 - Turn on every light in the house in the morning, particularly in the winter months
 - 10,000LUX light box for 10min (more increases anxiety)

Substances effects

- What caffeine does it do to sleep
 - Increased wakefulness, poor efficiency
 - negative emotional response is enhanced
 - positive reactions to positive events is subdued
 - Reduced stage 1 and 2 sleep – memory consolidation
 - Reduced duration of slow wave (stages 3 & 4) – emotional processing and fear extinction
 - Caffeine had no direct effect on REM sleep
- What alcohol does to sleep (and benzodiazepines) - depressants
 - See above AND - Destroys REM sleep
 - hypermetabolism (increased appetite)
 - daytime fatigue
 - loss of motivation
 - poorly functioning immune system (increased illnesses)
 - GI disturbances (increased inflammatory effects, irritable bowel, ulcers, diarrhea)
- What marijuana does to sleep (more research is needed)
 - Improves falling asleep for most patients (patient reported)
 - Marijuana strains with higher levels of THC typically reduces total REM sleep

Sleep

- Recommendations - what I tell my patients
 - Basic sleep hygiene
 - Increasing total sleep time to at least 7hrs for adults and 9hrs for teenagers/emerging adults
 - Minimizing/eliminating screen time within 2 hrs of desired sleep onset time
 - Get some exercise/movement. Being physically active during the day improves sleep quality because it raises your core body temperature.
 - Avoid sleeping in on non-school/work days.
 - Don't give yourself jetlag!! 1hour = 1 day. Wake up at the same time every morning, 7 days a week.
 - Want to catch up? Go to be earlier or take a nap (<60min)
 - Out late? Get up at the same time, take a nap (<60min)

Nutrition

- This information is for general anxiety and depression.
- If someone is struggling with an eating disorder of any kind – this likely does not apply.
- If someone is struggling with obsessive compulsive disorder – this has to be handled very carefully.
- This information is not meant to demonize individuals struggling with metabolic related diseases
- Food does not equate with morality, but the distinction is food that is beneficial vs detrimental to mental and physical health
- All of this usually falls on one person in the family.

Nutrition



Nutrition

Definitions

- Diet: a special course of food to which one restricts oneself, as in to lose weight or for a medical reason.
 - "I'm going on a diet"
- Diet: the kinds of food that a person, animal, or community habitually eats.
 - "I'm eating a vegetarian diet"

Nutrition



STANDARD AMERICAN DIET

Nutrition

STANDARD AMERICAN DISEASES

Nutrition

- Nutritional psychiatry is not all about food
- 33% of families with teens only eat 1-2 meals a week together
- 25% of families eat 7 or more meals a week together
- Why is this important?
 - Increases the strength of the family
 - Improves family cohesion, stability, connectedness
 - Improves problem-focused coping
 - social-emotional development
 - family rituals and routines, like the family meal, offer consistency and a venue for checking in with family members, and for learning and teaching healthy food behaviors and attitudes

Nutrition

- Nutritional psychiatry is not all about food
- Increased family meals is associated with the following in children/adolescents (more so with females):
 - Fewer eating disorders**
 - Less alcohol/substance use**
 - Less childhood violent behavior**
 - Less feelings of depression**
 - Less thoughts of suicide**
 - Increased self-esteem**
 - Improved school success**
 - Expanded vocabulary**
 - Higher standardized test scores**
- This is our first experience with group therapy!!!
- Recommendation is 6 family meals per week
- **The Benefits of the Family Table: *American College of Pediatricians***
- *February 2021*

Nutrition

- Brain-Gut Connection
 - 500 species representing 100 trillion bacteria in your GI system.
 - Beneficial and non-beneficial bacteria – influenced by many factors, including the food we eat and stress levels
 - Bi-directional communication between brain and GI system
 - Area of exploding research in last 20 years – but has been described in varying ways since the late 1800's.

Nutrition

- McGovern Commission (1977) releases *Dietary Goals for the United States* attempting to address heart disease, certain cancers, stroke, high blood pressure, obesity, diabetes, and arteriosclerosis – eat less fat
- Less fat = No taste
- Let's add sugar!!
- This has led to a 40+ year experiment on the US population

Nutrition

- **Ok, so what?**
 - Excess sugar found in hyperpalatable, hyperprocessed food
 - Proliferation of detrimental bacteria in gut
 - Breakdown in the protective lining in the gut
 - Increases infections and GI distress
 - Chaotic signaling between the gut and brain
 - Inflammation throughout the body
 - Systemic multi-organ distress, including in the brain
 - In 2020, the U.S. Food and Drug Administration finalized a new Nutrition Facts label

Total Sugars 15g	
Includes 7g Added Sugars	14%

Nutrition

- 61 names for added sugar: high-fructose corn syrup (HFCS), barley malt, rice syrup, beet sugar, dextrose, fructose, glucose, invert sugar, lactose, maltose, malt sugar, trehalose, turbinado, sucrose, galactose, agave nectar, and fruit juice concentrate.
- According to the FDA: Daily Value (DV) for Added Sugars is 50 grams (12 teaspoons) based on a 2,000-calorie daily diet.
 - This is likely too high - American Heart Association (AHA) recommends
 - Men: 9 teaspoons (38 grams)
 - Women: 6 teaspoons (25 grams)
 - Children: vary depending on their age and caloric needs, but range between 3-6 teaspoons (12 - 25 grams)
 - British Nutritional Foundation: 30 grams
 - World Health Organization: 25 grams

Nutrition – Common Concerns

- **Low fat anything** – particularly yogurt or yogurt with fruit added. A single cup (245 grams) of low-fat yogurt can contain over 45 grams of sugar (11 teaspoons).
- **Breakfast cereal, Granola bars, Protein bars**
- **Most fruit juices** – as bad as **soda**
- **Sports drinks** - standard 20-ounce bottle of a sports drink has 32.5 grams of sugar (9 teaspoons).
- **Sauces/Dressings** – BBQ sauce is ~33% sugar by weight
- **Flavored coffee** - 20oz flavored coffee contains 45 grams of sugar (11 teaspoons).

Nutrition



Nutrition



Will Not Work



Nutrition

- 3 recommendations
 - **Prepare food and eat with other family members** 6x per week (out of 21) – no tv, no cell phones
 - **Color** – Eat a rainbow of variety, try new things!!
 - **MIND** - Mediterranean-DASH Intervention for Neurodegenerative Delay diet, combines portions of the DASH (Dietary Approaches to Stop Hypertension) diet and the Mediterranean diet.

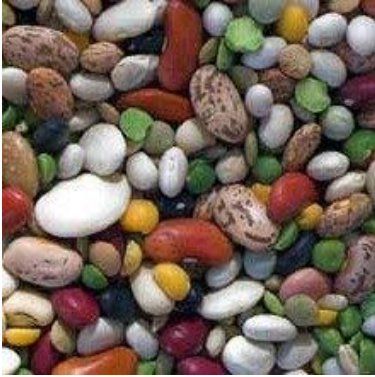
Nutrition



Nutrition



Nutrition



Nutrition



Nutrition



Generic Example

- 25 year old
- Major depression, ongoing daily anxiety, occasional panic
- Has tried and failed multiple medication trials with multiple psychiatrists – “nothing seems to work!!”

Generic Example

- **Sleep – gets into bed at 11pm, on phone till 1am – usually to distract from anxious thoughts, then gets up around 7a but on the weekends gets up at 12noon.**
- Exercise/Movement – too tired
- **Diet and appetite – very little appetite due to anxiety, and eats fast food or snacks to save time – but keeps gaining weight and can't understand why**
- Spiritual Connectivity/Mindfulness – none – too anxious to sit quietly
- Social/Relationship Connectivity- very little – either too anxious or socially withdrawing
- Hobbies – interests but no longer doing them
- Work Schedule – working more hours and less productive, taking many days off d/t illness
- Financial Difficulties/Debt – impulsive emotional shopping “retail therapy
- Social media/Internet – 6 hours per day – distraction from anxiety and can easily
- **Caffeine – 2 Celsius, 3 20oz Diet Coke's spread out throughout the day (610mg)**
- Alcohol – on weekends only – helps fall asleep but feels miserable the next day
- Tobacco/Vaping – weekends only, vaping
- Marijuana – multiple x/wk, usually before bed to help lower anxiety and fall asleep.
- Other Illicit Substances - none

Nutrition

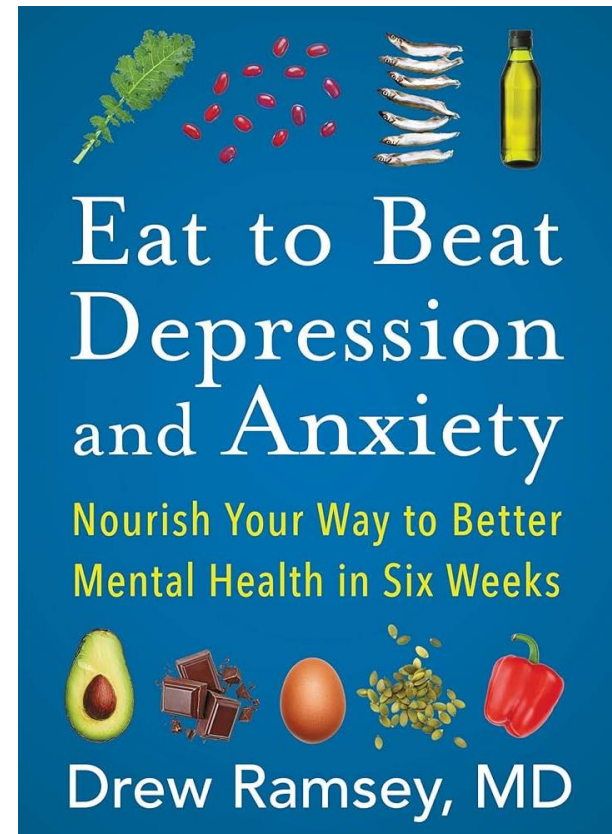
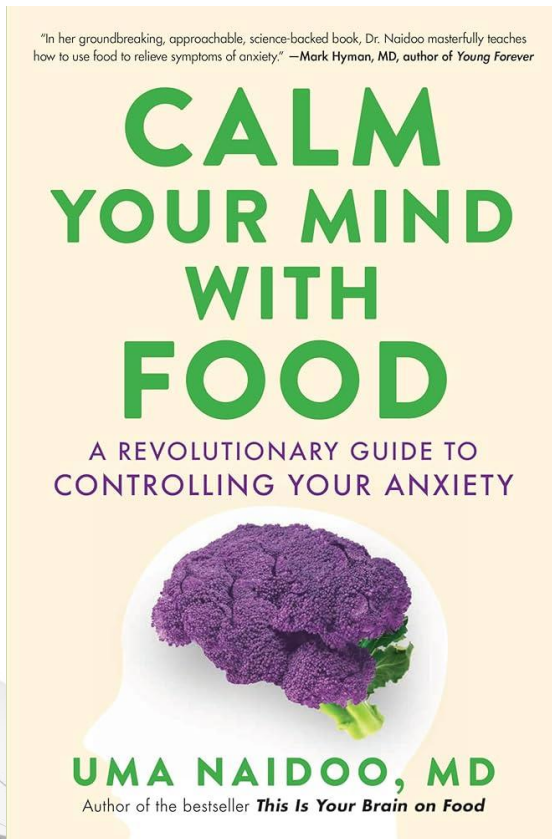
Recommended to watch

**Fed Up
(2014)**



Nutrition

Recommended to read



??Questions??



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