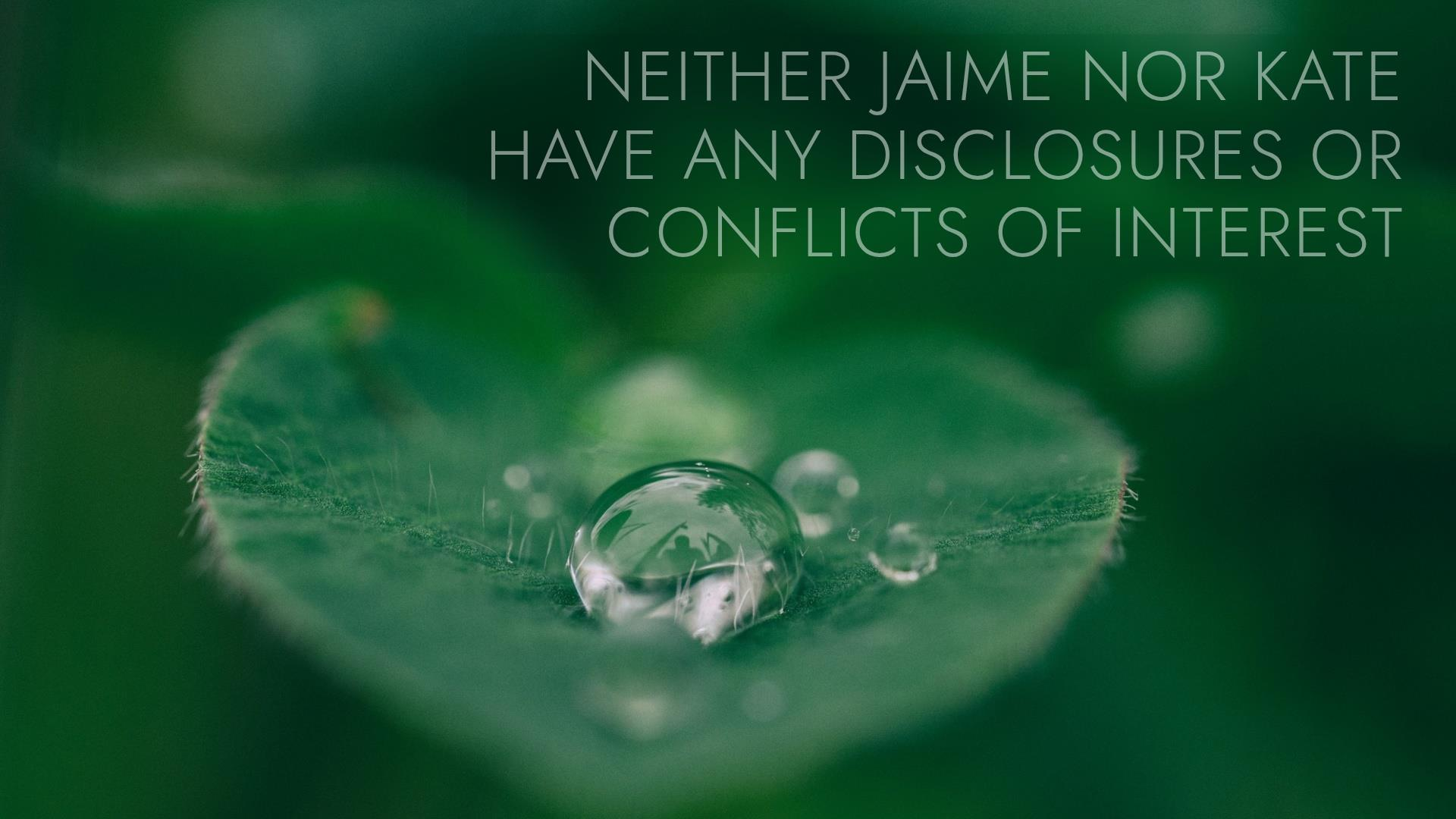
THE THRIVE WELLNESS CLINIC

Jaime Grund, LGC and Kaitlin M. Pielage, APRN


NEITHER JAIME NOR KATE
HAVE ANY DISCLOSURES OR
CONFLICTS OF INTEREST

PREVENT DISEASE, LOWER RISK, IDENTIFY DISEASE AT ITS EARLIEST, MOST TREATABLE STAGE

Hereditary Cancer Risk

Cancer Prevention Clinic

Precision Oncology

The THRIVE Wellness Clinic

Precision Medicine

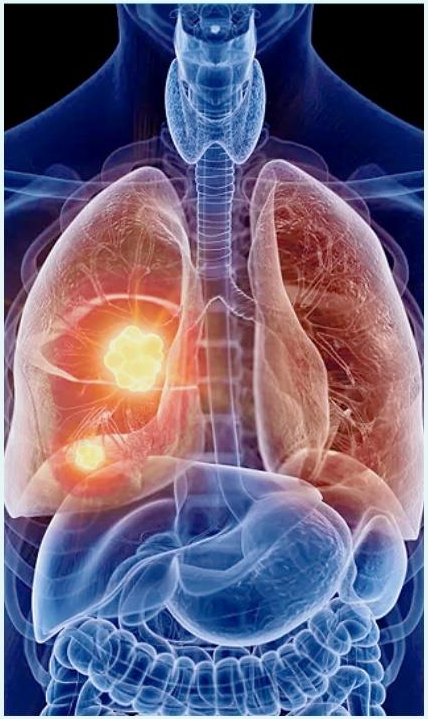
Pharmacogenomics

Neurogenetics

Cardiogenetics

Perinatal Genetics

FOUR HORSEMEN OF DEATH - DR. PETER ATTIA



Cancer

Cardiovascular Disease

Neurodegenerative Disease

Metabolic Syndrome

CENTENARIANS: SURVIVORS, DELAYERS, AND ESCAPERS

SURVIVORS: 24% of males and 43% of females fit the survivor profile (or those **who had** a dx of age-associated illness prior to age 80).

DELAYERS: 44% of males, 42% of females fit the delayer profile (or those who **DELAYED** the onset of age-associated illness until at least the age of 80).

ESCAPERS: 32% of males, 15% of females fit the escaper profile (or those who **attained their 100th year of life without the diagnosis** of common age-associated illnesses).

Evert J, Lawler E, Bogan H, Perls T. Morbidity profiles of centenarians: survivors, delayers, and escapers. J Gerontol A Biol Sci Med Sci. 2003 Mar;58(3):232-7. doi: 10.1093/gerona/58.3.m232. PMID: 12634289

The THRIVE Wellness Clinic

Identify **Disease** Risk

Physical Exam

Personalized Screening Plan

Nutrition

Personalized Intervention Plan

Exercise

Address Barriers to Care

Mental Health and Sleep

THE THRIVE WELLNESS CLINIC

Intensive Wellness Screening and Interventions

Patient Identification

- Offer to current Prevention Clinic patients
- Eventually would like to expand offerings to more patients

Intake

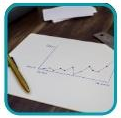
- Extremely detailed personal & family history
- Exploration of wellness goals
- Set expectations

Medical Review

- Detailed review of medical & family history
- Review of medications
- Determine areas of strengths and weaknesses
- Determine areas of growth

Precision Wellness Plan Review

- Extensive education and empowerment of patient over their own health care
- Review cadence of program
- Order screening labs and imaging
- "Module" model of care



Results Review & Long-term Planning

- Review results and implications for health
- Review recommended interventions
- Review plan for accountability and follow up

Research

- All patients enrolled in registry unless they decline

PRECISION WELLNESS EVALUATION PROCESS

Intensive Wellness Screening and Intervention

Intake & Chart Review

- Medical History
- Family History
- Medication review
- Mental Health Assessment
- Sleep Assessment
- Exercise Assessment
- Nutrition Assessment
- Past lab review
- Update medical chart

Financial Review

- Review coverage and multiple medical guidelines (NCCN, AHA, etc) to find opportunities for covered wellness evaluation
- Provide LMN and P2P as needed
- Review and offer "outside of guideline" evaluations if patient wants to proceed with self-pay options

Personalized Wellness Plan

- Discuss patient driven prioritized goals- 9th decade goals
- Discuss insights from testing and health driven prioritized goals
- Set goals in nutrition, exercise, mental health, sleep, etc.
- Review cadence for lab / imaging reassessment

Initiate Modules of Intervention

- Nutrition, exercise, mental health, sleep
- Use of CGM
- Review plan for reassessment of goals (make them well defined, finite).
- Use of wearables to help with accountability
- Data can feed into Epic for review at visits

Follow up & Accountability

- Follow up at regular intervals with APRN in Clinic until finished (q2-3 month cadence)
- Wearable data - personal accountability and can use mychart for accountability
- Navigator support for weekly or bimonthly check ins (future state)
- ***Patient driven***

Standard Metric Goals

Fasting glucose less than 100 mg/dL

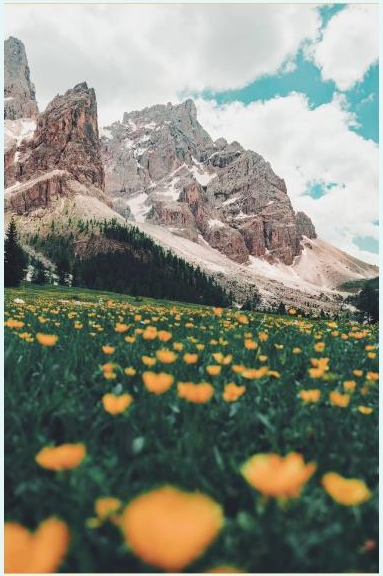
Triglycerides are less than 150 mg /dL

HDL above 40 for men, 50 for women

Waist circumference is less than or equal to 102 cm (40 inches) for men and less than or equal to 88 cm (35 inches) for women

BP less than 120/80 mm/Hg

Only **6.8% of Americans** meet all standard metric goals (O'Hearn et al., 2022).



CASE STUDY#1

- 34 yo F from the High-Risk Breast Clinic would like to discuss wellness interventions in her life to help improve her health and mitigate her cancer risk.
- 5'6", 170#, BMI 27.4. PMHx PCOS, HLD, moderate, recurrent MDD, s/p appendectomy at age 16. No allergies. G2P2, LMP 14 days ago. Has tried/failed 8 weeks of uptitration of both escitalopram and sertraline for management of MDD.
- Family hx - breast cancer in mother and maternal aunts x 2, youngest age diagnosed was 40. Paternal uncle colon cancer dx age 45. Father and PGM first MI <45 years old with HLD, HTN.

CASE STUDY #1

- Educated on purpose of clinic, wearable data. Pt has a smart watch and wants to try a CGM.
- Nutritional habits: Oatmeal or bagel for breakfast with coffee. Will have a lunchmeat sandwich, chips, fruit for lunch and a diet soda. For dinner, will have foods like fried chicken, spaghetti and meatballs, etc. If she eats out, will have foods like chipotle. Will have drive thru rarely. Has two mixed drinks per week socially.
- Exercise habits: Chases around kids. No regular exercise routine.
- Stress: Moderate, recurrent MDD. Tried/failed two medications after appropriate uptitration. More stressful factors are things related to work (SW at local hospital), day to day family routine. Uses deep breathing, sees a therapist, no personal time t/o the week.
- Sleep habits: Kids wake t/o the night, avg 6-7 hours per night. No sleep aids. Dark room, fan, goes to sleep to TV and sleeps with it on. Partner snores.
- Personal goals: Lose weight, start exercising, **feel better managing day to day life**.

CASE STUDY #1

Review of labs

1. Annual CBC, BMP, hepatic panel, iron studies, WNL
2. Fasting lipid panel: **Total Cholesterol 265 mg/dL, LDL 170 mg/dL, HDL 44 mg/dL, Triglycerides 170 mg/dL**
3. TSH WNL 1.34
4. hsCRP, LDH WNL
5. **ApoB/A ratio high risk, Lp(a) 60 mg/dL**
6. **HgbA1C 6.0%, fasting insulin 12 uIU/mL**

Genetics

1. Has met with cancer genetics GC d/t family history of breast cancer in mother and maternal aunts x 2, youngest age diagnosed was 40. Paternal uncle colon cancer dx age 45.
2. No family hx skin cancers or melanoma.
3. Ambry 67 gene panel negative
4. Tyrer-Cuzick score 28%

Review of Imaging/Screening

1. Mammogram annually the past 2 years- no concerns. Note extremely dense tissue.
2. Screening MRI last year - no concerns. Continue
3. UTD Pap Smears/HPV testing
4. Non smoker
5. Plan for colonoscopy age 35 - next year. Needs GI referral.
6. No current screening with dermatology.

CASE STUDY #1

Mental Health

1. Continue with therapist.
2. PGx testing.
3. Work- SW.
4. Day to day routine - division of responsibilities, tips/tricks, other things that require time (sports, lessons, etc).
5. Identify 2 quick win changes that would allow for more time: Meal plan for a month, use click list for grocery pick up regularly. Meal prep Sunday afternoons.

Nutrition

1. Try CGM for 1 month.
2. BMI 27.4, goal just under 25.
3. Meal plan- heavy protein, vegetables, low carb. Goal 1 g/kg protein/day - 77 g protein per day. Lean towards plant protein- away from saturated fats.
4. Limit eating out and if she does eat out- more places like chipotle with healthier options.
5. Eliminate UPF and alcohol
6. Intermittent fasting - dinner 7 pm, fast with coffee only until lunch next day (16-17 hrs)
7. Move from insulin resistance to insulin sensitivity

Exercise

1. No current regimen
2. Use smart watch to keep track of steps. Goal 7-10k per day.
3. Look for opportunities in her normal day to add in squats, cardio (youtube videos for kids with action in them). Take steps instead of elevator.
4. Plan to add in regular strength training at home (hand held weights - regimen while having down time).
5. Add in balance - yoga at home. Play with kids and do yoga with them.

CASE STUDY #1

Sleep

1. Current habits: Kids wake t/o the night, avg 6-7 hours per night. no sleep aids. Dark room, fan, goes to sleep with TV and sleeps with it on. Partner snores.
2. Goal 8 hours of high-quality sleep per night
3. Eliminate TV- use white noise.
4. Keep bedroom for sleep/relaxation only - not a workplace, etc.
5. Ask partner to consider a sleep study.
6. Plan a night time routine - no blue screens after 6pm, no caffeine after 4pm.

Wearables

1. Smartwatch - HR - Resting 60-100, Zone 2 111-130 bpm, Zone 3 130-149 bpm
2. Smartwatch - Steps- 7-10k / day
3. Smartwatch - BP - 120/80 avg
4. Smartwatch - Sleep- Insight about sleep routines - reliable?
5. CGM - look at normal habits / worst habits and what happens to glucose / how do you feel? How do foods, exercise, sleep, stress affect glucose? **Goal: Fasting glucose 100 mg/dL avg or lower, keep postprandial variances within 20 points of fasting levels.** Increased glucose overnight = stress. Spike with exercise on empty stomach is good!

Referrals

1. Pharmacogenomic testing
2. High apo B/A ratio, high Lp(a), known HLD with persistently elevated fasting lipid panel. Consider lipid lowering agent. Recommend CT coronary angiogram W Contrast or CT cardiac for plaque for CVD screening. Consider referral to cardiology.
3. Could consider cardiogenetics evaluation.
4. Refer to GI for colonoscopy next year

CYP2B6	*1/*4		**Rapid metabolizer** Increased enzyme activity is likely based on the genotype results. This activity is more than a normal metabolizer, but less than an ultrarapid metabolizer. The metabolism of the medication affected by this gene is predicted to be increased.
CYP2C19	*17/*17		**Ultrarapid metabolizer** Increased enzyme activity is likely based on the genotype results. The metabolism of the medication affected by this gene is predicted to be increased.
CYP2D6	*10/*59		**Intermediate metabolizer** Decreased enzyme activity is likely based on the genotype results. Decreased metabolism of the medication affected by this gene is predicted.
SLC6A4	S/S (Sa/Sa)		**Reduced expression** Genotype consistent with a reduced expression of the SLC6A4 transporter compared to other genotypes. This genotype was shown to exhibit different phenotypes in East Asian populations, as opposite outcomes were observed for this genotype in East Asian populations when compared to Caucasian populations.

CASE STUDY #1

REVIEW OF PHARMACOGENOMIC TESTING

CYP2B6 Rapid Metabolizer- **Avoid sertaline** due to increased risk of ineffectiveness.

CYP2C19 Ultrarapid Metabolizer - **Avoid escitalopram** and **sertaline (both SSRIs)** due to increased risk of ineffectiveness.

CYP2D6 Intermediate Metabolizer

Reduced function at SLC6A4 - Preliminary data suggests **decreased efficacy and increased intolerability** of SSRIs in those with European ancestry.

Recommend initiating **bupropion**, which is currently not known to be impacted by PGx variation. Also associated with weight loss, which would be helpful in meeting other treatment goals. Initiated at **150 mg XR PO daily**, titrated to 300 mg PO daily. Tolerated much better.

Thanks to Josiah Allen, PharmD, for assist.

GENERAL RECOMMENDATIONS

MENTAL HEALTH

Adults

Per NIH report in 2021, approx 23.08% of adults in the US experienced a mental illness in the past year (approx 60 million Americans).

Suicide

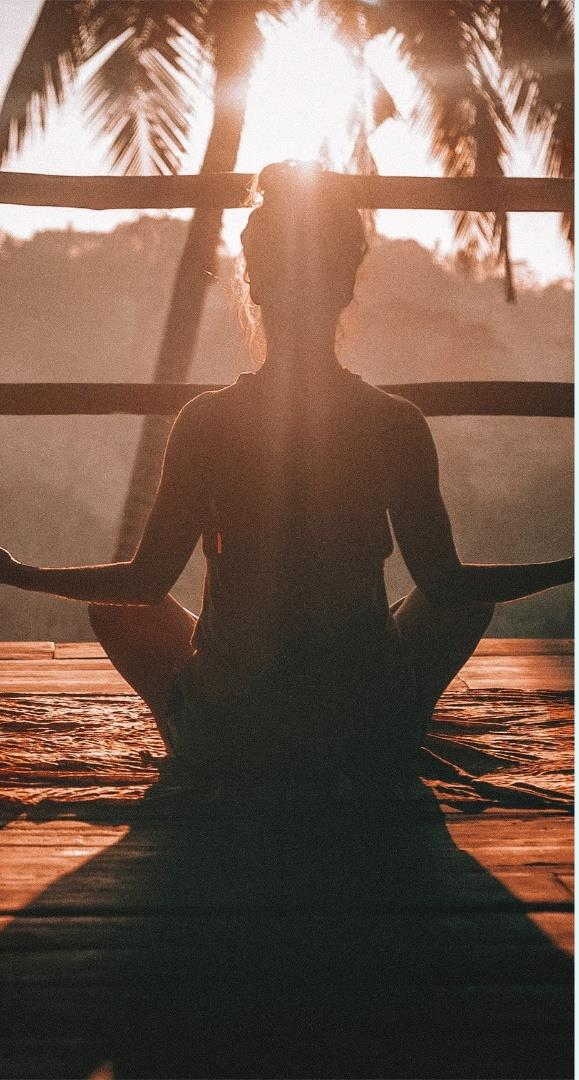
In 2022, there were over 49,000 suicide deaths in the United States, noting approx one death every 11 minutes (CDC, 2024).

Teens

According to Mental Health America, approx 20.17% of youth (ages 12-17) reported suffering from at least one major depressive episode in the past year (2024).

Loneliness

A Livingston survey published in 2019 shows that, on average, Americans aged 60 and older spent over half of their waking hours alone (approx 7 hours/day). For those living alone, this increased to over 10 hours per day.



MENTAL HEALTH

Isolation

Approx 23% of adults aged 60 and older live alone, which translates to approx 16.7 million people.

Social Media

Mindful use of social media is recommended. At times, it can enhance connection and improve self-esteem and a sense of connection. Alternatively, it can increase feelings of isolation, stress, and pressure to compare oneself to others (Zsila & Reyes, 2023).

Downstream Effects of Isolation

Social isolation can lead to negative health outcomes including less cognitive stimulation, difficulty staying active, and challenges managing health conditions.

Exercise

Exercise is shown to help enhance mood - 15 minutes of running per day or one hour of walking per day can decrease risk of depression by 26% (Choi et al., 2019).

Healthy diet and sleep can help with this as well.

NUTRITION

Choose foods high in protein, lots of vegetables.

If it comes from the land or animals, it's usually ok. If it comes through a factory, it is not a good choice.

Don't eat foods with refined added sugars, refined industrial vegetable and seed oils, and refined grains (UPF).

NUTRITION "TO DO" LIST

- **Shop on the perimeter of the grocery store!** UPF often are found on the shelves in the middle of the store.
- Buy/obtain **hormone free, organic, pasture-raised, grass-fed** animal products and fruits/veggies.
- **Increase daily oral protein intake** (to a goal of 1-2.2 g/kg if no kidney issues), **daily fiber intake** (around 25-30 g), and vegetable intake.
- **Eliminate** ultra-processed foods, refined grains, industrial vegetable and seed oils, and refined added sugars.
- **Avoid alcohol and smoking.**

Attia, P., & Gifford, B. (2023). Outlive: The Science and Art of Longevity. New York, NY: Harmony Books.

Means, C. (2023). Good Energy: The Surprising Connection Between Metabolism and Limitless Health. New York, NY: Penguin Random House.

NUTRITION "TO DO" LIST

- **Don't eat "naked carbs"** - pair carbs with protein, fats, fiber to slow digestion, increase satiety, and reduce the influx of glucose in the bloodstream.
- **Sequence meals** for optimal metabolism by "preloading" with low-glycemic foods. Eat non-starchy veggies, fat, protein, and/or fiber before the higher carb part of a meal to lower post-meal glycemic spikes. Always order a salad with greens and some protein before eating a starchy entree or having dessert
- **Tighten the eating window.** Eat in a narrower window during the day to lower glucose and insulin spikes compared to eating the exact same amount of food spread out over a longer period of the day.
- **Eat earlier.** Eating the same meal in the morning will likely cause a lower glucose spike at that time of day rather than late at night.

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NUTRITION "TO DO" LIST

- **Avoid consuming liquid sugar** (soda, drinks with added sugars like Frappuccinos, sweet tea, alcohol with added sugars). **Avoid artificial sweeteners** such as aspartame (Equal), sucralose (Splenda), and saccharine (Sweet N Low) as it can lead to higher weight, microbiome disturbances, alteration of GI hormone levels, and can cause insulin release.
- Consider **adding high protein option**s to meals to reach protein goals (Chia seeds (4.7 g protein per ounce), hemp seeds (9 g protein per ounce), pumpkin seeds (7 g protein per ounce), sunflower seeds (6 gm protein per ounce), flax seeds (5 g protein per ounce), sesame seeds (4.8 g protein per ounce)).
- Use **food adjuncts** like vinegar and cinnamon to lower glucose responses (i.e. apple cider vinegar).
- **Walk for at least 15 minutes** after meals and eat thoughtfully.

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ULTRA-PROCESSED FOODS (UPF)

"**Investigations from many countries link ultra-processed food consumption with greater risk of disorders, diseases, and premature death.** Cohort studies have found links with obesity and adiposity outcomes, type 2 diabetes, hypertension, dyslipidaemia, hyperuricaemia, CVD, breast, ovarian, brain, and overall cancer, non-alcoholic cirrhosis, Crohn's disease, chronic renal failure, depression, cognitive decline, dementia, and all-cause mortality" (Levy et al., 2023).

A systematic review of 43 studies found **37 studies that related dietary UPF exposure to at least one adverse health outcome.** Among adults, these included overweight, obesity and cardio-metabolic risks; cancer, type-2 diabetes and cardiovascular diseases; irritable bowel syndrome, depression and frailty conditions; and an increased all-cause mortality. Among children and adolescents, these included cardio-metabolic risks and asthma. **No study reported an association between UPF and beneficial health outcomes** (Elizabeth et al., 2020).

WHY EXERCISE?

1. Over 750,000 US Veterans
   - Ages 30-95 years old
2. Cardiorespiratory fitness is a key predictor of longevity
   - Encourage engagement by asking questions.
3. Categorized into 6 fitness levels
   - Least fit: 4.7 METS
   - Extremely fit: 14.3 METS
4. Median follow up of 10.2 years
   - The least fit group had 4x greater risk of death compared to those in the top 2% age/sex
5. Exercise is the **most effective** longevity "drug"

Brawner, C. A., Ehrman, J. K., Schairer, J. R., & Keteyian, S. J. (2022). Cardiorespiratory fitness and mortality in over 750,000 US veterans: A cohort study. Journal of the American College of Cardiology, 80(7), 1234-1245. https://doi.org/10.1016/j.jacc.2022.06.012

EXERCISE

Goal of at least 7k steps per day to reduce premature all-cause mortality by 50-70%.

AMA recommends at least 150 minutes moderate-intensity aerobic activity or 75 minutes of vigorous aerobic activity (or a combo of both) throughout the week.

Add moderate intensity weight lifting 2-3 times per week for strength training. Include balance training (bosu ball, yoga, etc).

American Heart Association. (n.d.). AHA recommendations for physical activity in adults. The American Heart Association. Retrieved February 13, 2025, from https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults

SLEEP

"The best bridge between despair and hope is a good night's sleep."

E. Joseph Cossman

Goal: 8 hours in bed nightly -- high-quality sleep

Chronic sleep debt has been shown to be linked to adverse health outcomes from metabolic dysfunction to type 2 diabetes to hormone imbalances.

Sleep is not a waste of time!

Poor sleep contributes to **insulin resistance, HTN, cardiovascular diseases, coronary heart diseases, and obesity**. Poor sleep and high stress increase cortisol, which **raises blood pressure**.

Good quality sleep allows for improved cognition.

REM sleep helps our brains grow and develop, improves creativity and problem solving, improves procedural memory (athletes), process emotions, maintain emotional awareness. **Deep sleep allows for autophagy of tau and amyloid -beta proteins**.

SLEEP

"The best bridge between despair and hope is a good night's sleep."

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Electronics

Avoid stimulating electronics 2 hours before bedtime. If you don't have an option, make sure you use a setting that reduces blue light from your phone. **Avoid anything anxiety-producing or stimulating** an hour before bed.

Heat therapy

Consider spending time in a sauna, hot shower, or hot tub before be**d (lowering your body temperature after exposure to heat can signal to your brain that it is time to sleep)**. The room you sleep in should be **cool (mid 60s)**.

Healthy habits

Don't eat anything within 3 hours of bedtime. **Darken the room** completely or use an eye shade. **Give yourself enough time** to sleep (go to bed 8-9 hours before needing to wake up). **Fix your wake up time and don't deviate** (even on weekends). Try not to obsess over your sleep. If you need an alarm clock, turn it away from you while you're sleeping.

ENVIRONMENTAL TOXINS

Check your public water content at www.ewg.org. Test your water. Consider obtaining a water filter.

Consider avoiding excessive fluoride exposure, especially in younger children. Studies are ongoing, but there has been discussion about high amounts of fluoride affecting children's IQ levels.

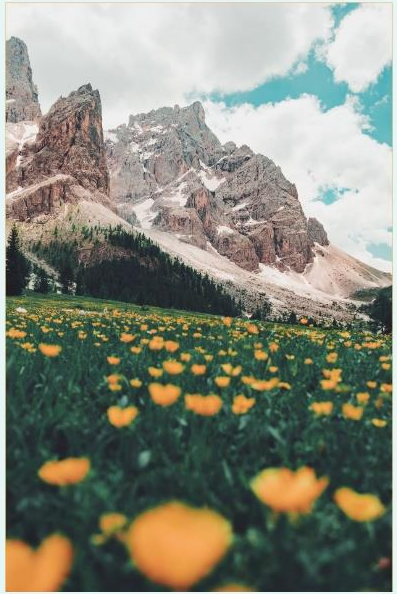
Avoid exposure to known carcinogens (tobacco smoke, asbestos, tanning beds, air pollution, pesticides, paints/varnishes, gasoline, etc).

The NTP monograph concluded, with moderate confidence, that **higher levels of fluoride exposure**, such as drinking water containing **more than 1.5 milligrams of fluoride per liter**, are associated with **lower IQ** in children.

Miller et al. published in 2022 revealed **16 out of 27 clinical trials** showed some evidence of a **positive association** between food dye exposure and adverse behavioral outcomes in children, with 13 associations being statistically significant, among these behaviors were **hyperactivity, inattention, impulsivity, and aggression.**

ONE STEP AT A TIME

Choose 1 or 2 "low hanging fruit" per month and 1 loftier goal over 3-6 months. Small changes are more sustainable.



THE FUTURE IS ALREADY HERE…

Non-Invasive
single gene testing

Full Genome
Testing

"Curing" Genetic
Diseases

"Liquid Biopsy"
CHIP

Molecular Cancer
Surveillance

Pharmacogenomics

DETECTION TO PREVENTION

QUESTIONS?

askgenetics@stelizabeth.com

859-301-GENE (4363)

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