LIFESTYLE MEDICINE FOR BRAIN HEALTH

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CO-FOUNDER, RUCKUS HEALTH

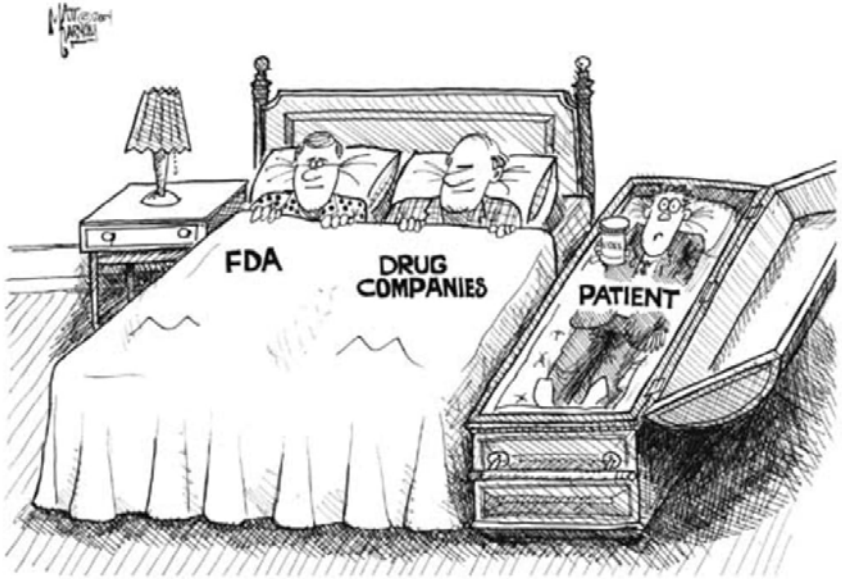
Your health isn't everything, but without your health, everything is nothing.

- a wise man

DISCUSSION TODAY:

- Alzheimers today in the US
- How Lifestyle Medicine can prevent and treat cognitive impairment
- Practical advice for all of us who want to optimize brain function

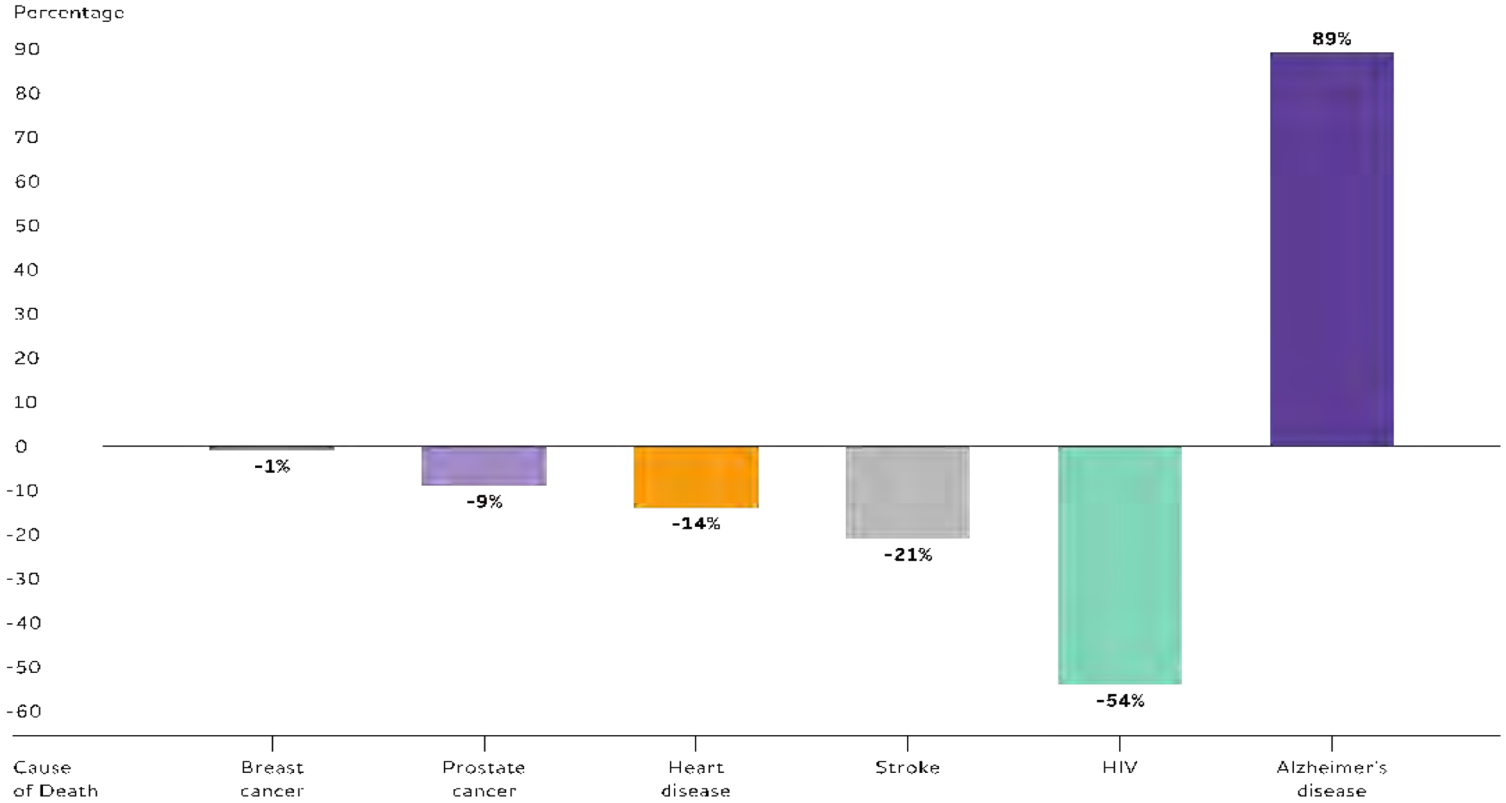
CDC, 2019



- Heart disease: 659,041
- Cancer: 599,601
- Accidents (unintentional injuries): 173,040
- Chronic lower respiratory diseases: 156,979
- Stroke (cerebrovascular diseases): 150,005
- Alzheimer's disease: 121,499
- Diabetes: 87,647
- Nephritis, nephrotic syndrome, and nephrosis: 51,565
- Influenza and pneumonia: 49,783
- Intentional self-harm (suicide): 47,511

FIGURE 5

Percentage Changes in Selected Causes of Death (All Ages) Between 2000 and 2014



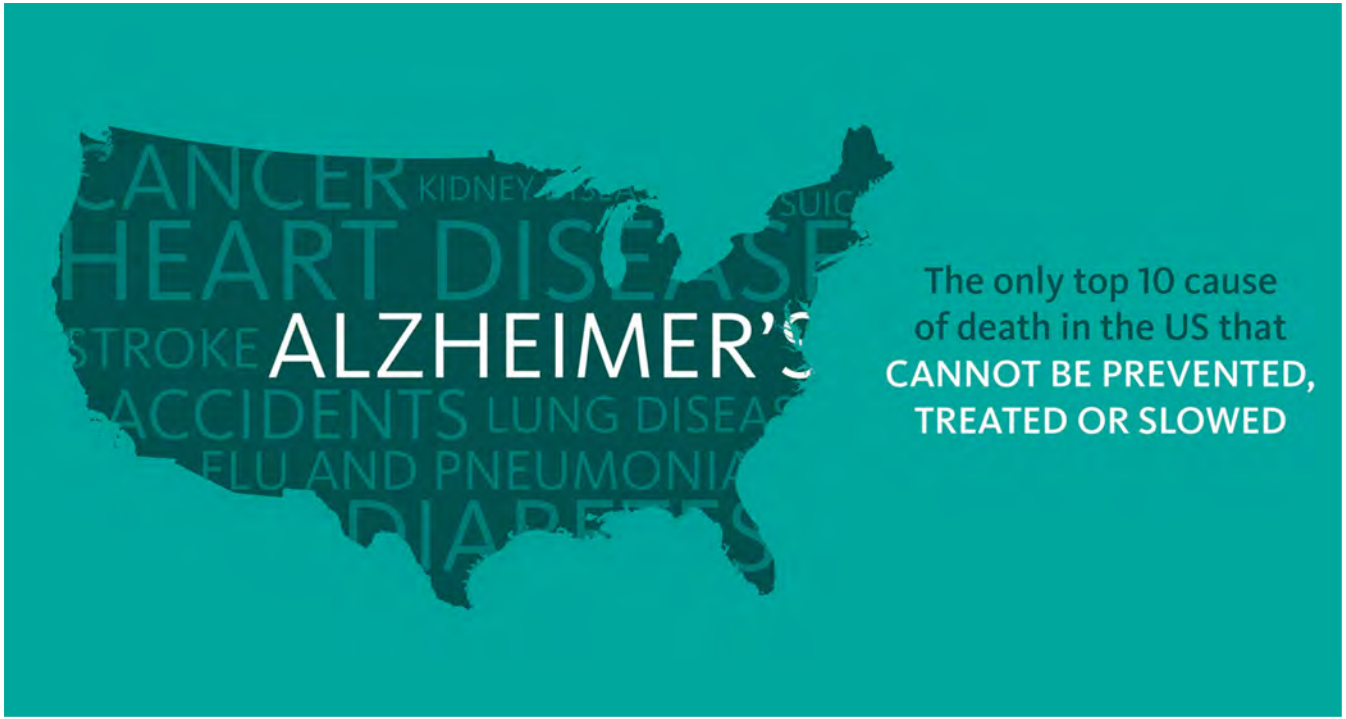
Created from data from the National Center for Health Statistics.[208,219]

WHAT IS ALZHEIMER'S DISEASE?

- Most common type of dementia
- Accounts for 60%-80% of cases
- Slowly destroys memory, thinking skills, and ability to carry out basic functions

[4]Alzheimer's Association. What is Dementia? Accessed June 8, 2015 from website: http://www.alz.org/what-is-dementia.asp#causes

[5]National Institute on Aging. (2015) Alzheimer's Disease Fact Sheet.

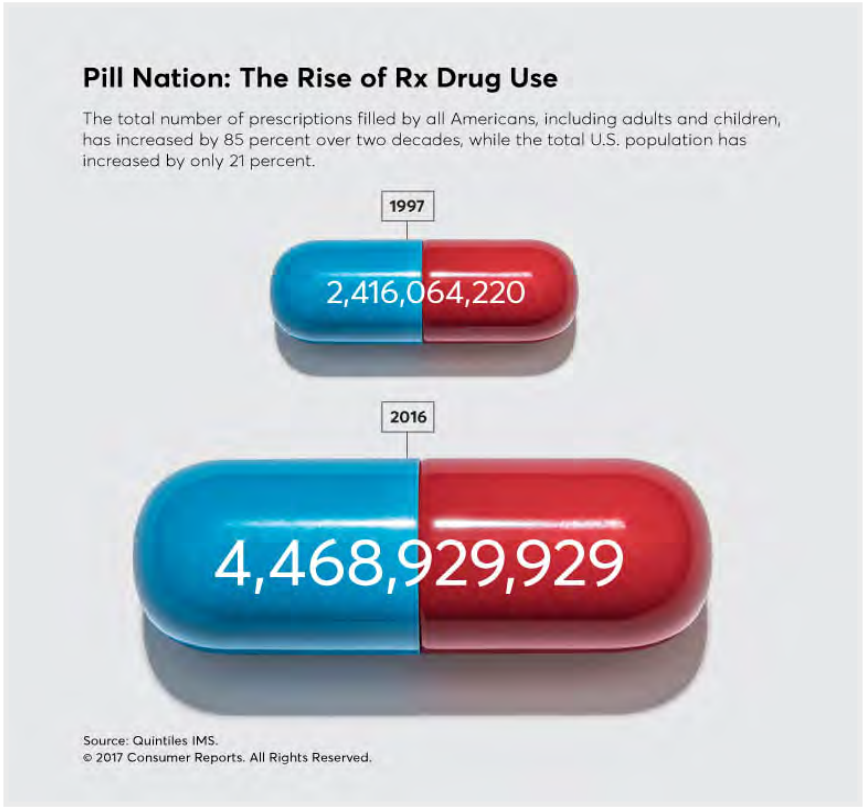

CANCER
KIDNEY
HEART DISEASE
STROKE
ALZHEIMER'S
ACCIDENTS
LUNG DISEASE
FLU AND PNEUMONIA
DIABETES
The only top 10 cause of death in the US that CANNOT BE PREVENTED, TREATED OR SLOWED

THE BIG MYTH

CHRONIC DISEASE TODAY… PILLS AND PROCEDURES

180,000* serious or fatal adverse drug reactions reported to the FDA, making drugs a significant % of US deaths

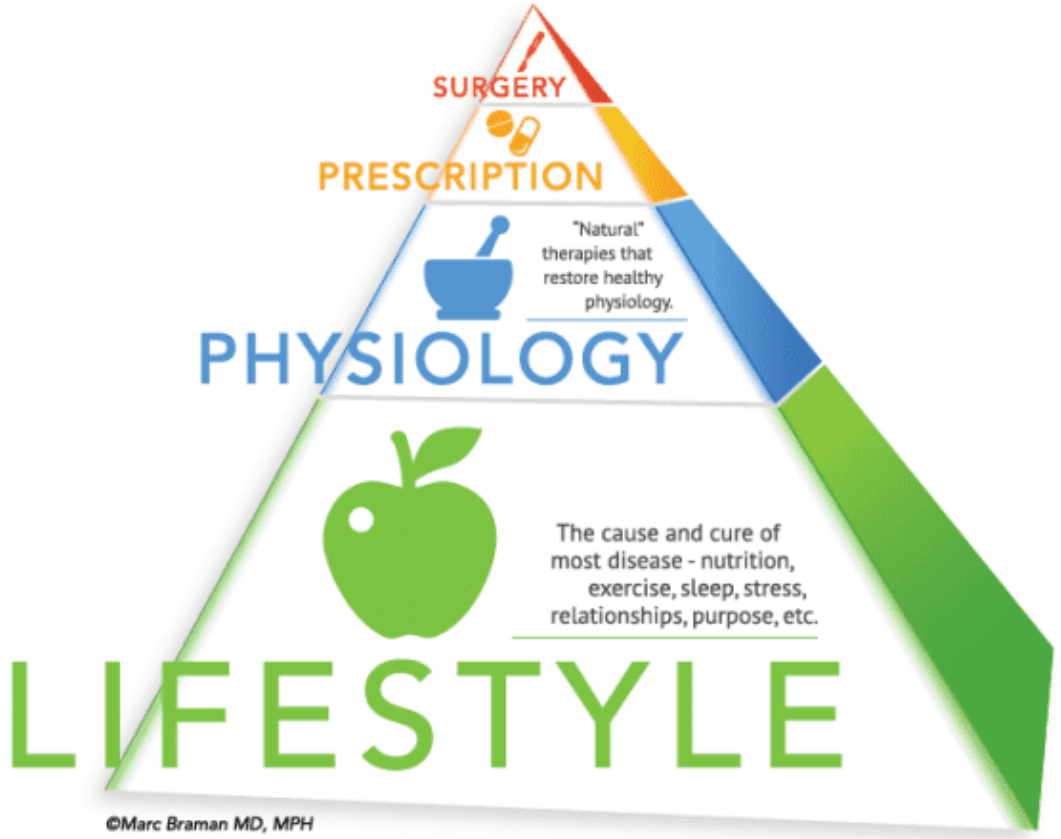
*2011 improperly or properly prescribed



WHOLE HEALTH - TREATMENT

ACUTE - SEVERE
Foreign, Invasive
Costly

CHRONIC
Natural
Inexpensive

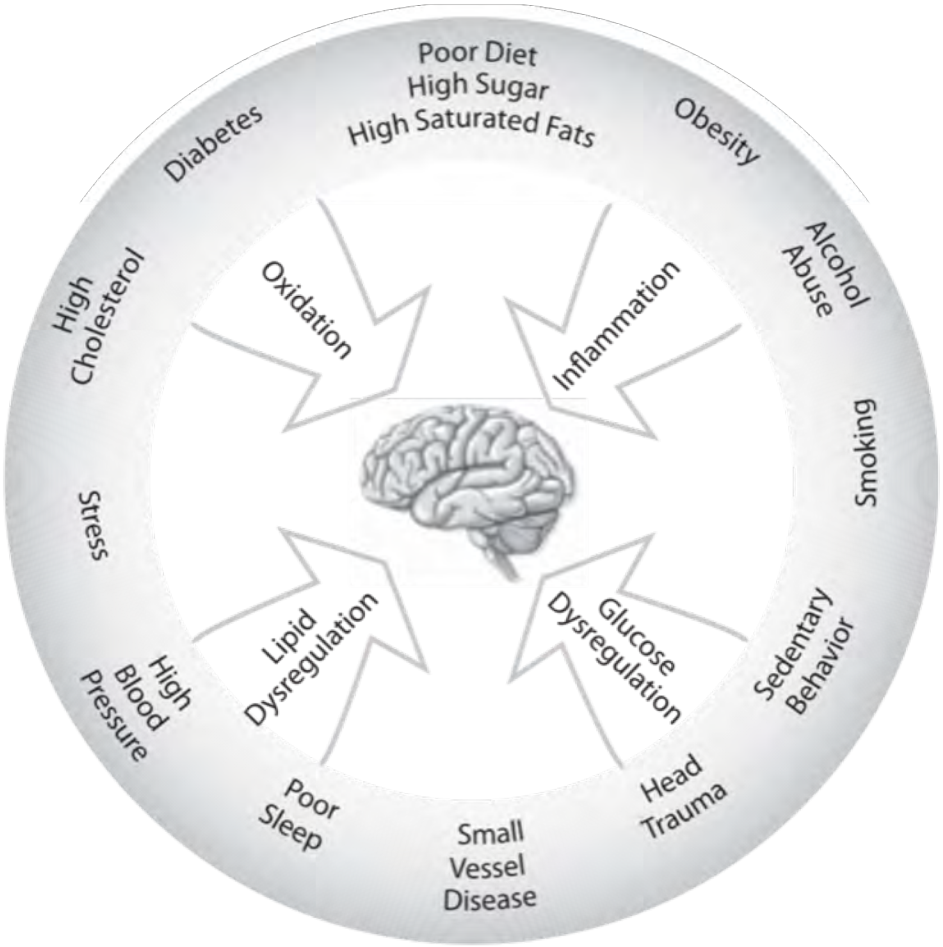


LIFESTYLE MEDICINE DEFINITION:

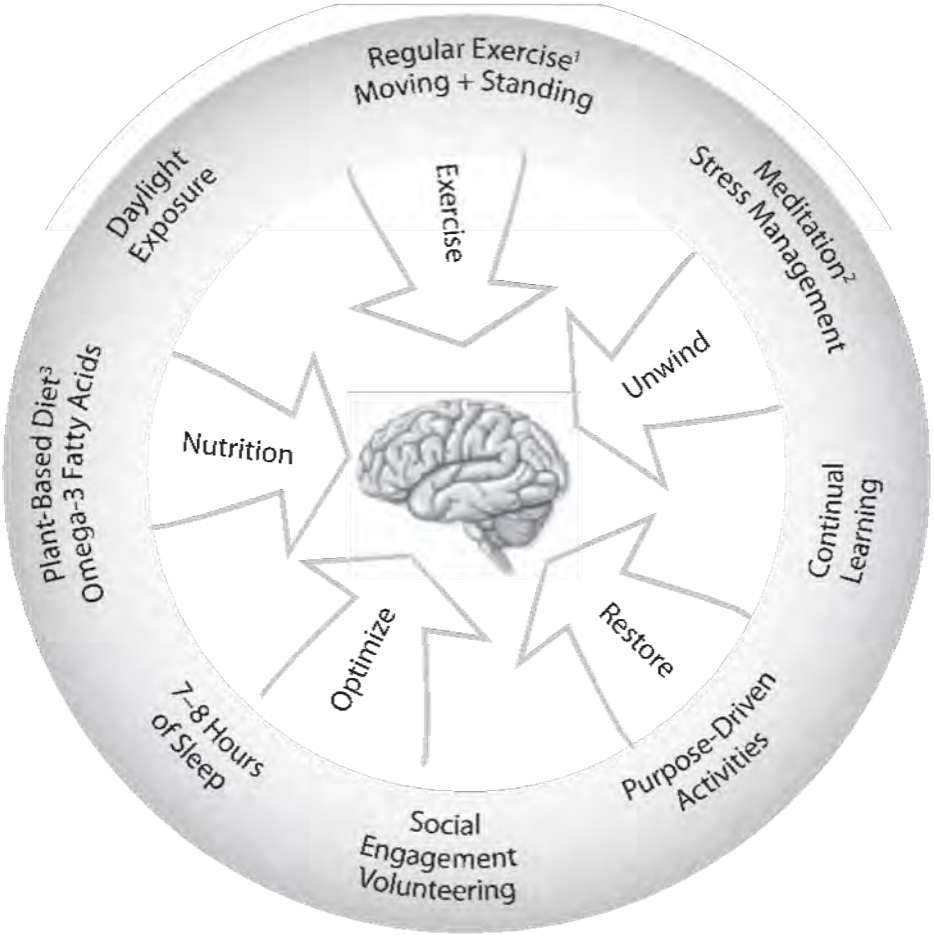
Lifestyle medicine is the ***evidence based*** *practice of helping individuals and families adopt and sustain* ***(natural) healthy behaviors*** *that affect health and quality of life…*

LIFESTYLE INTERVENTIONS

RISK FACTORS

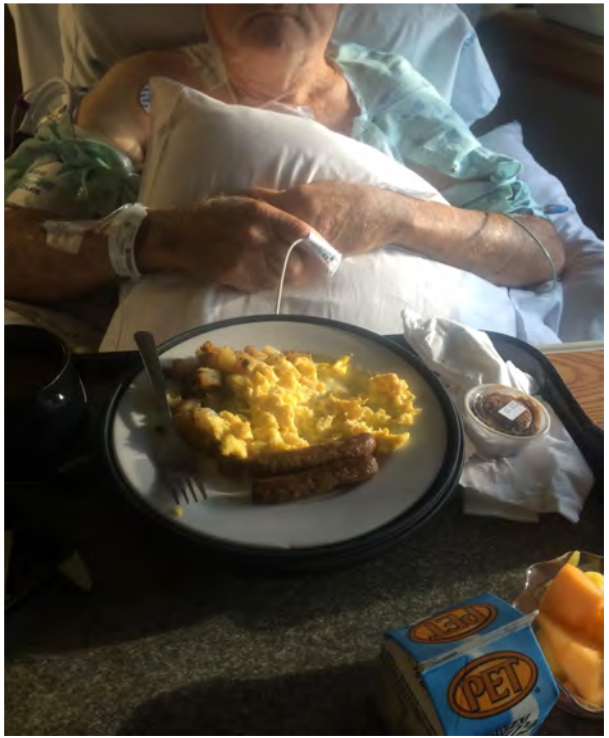


PROTECTIVE FACTORS



Let food be thy medicine
and medicine be thy food.

- Not Hippocrates



The American Diet: Designed for Disease

Source: USDA Agriculture Fact Book 98: Chapter 1-A

- A **whole food plant-based** diet protects the brain (and heart…and the rest of you)
- Saturated fats and sugars are associated with insulin resistance and increased inflammation in the brain

"The Incidence of Dementia and Intake of Animal Products: Preliminary Findings from the Adventist Health Study"

ADVENTIST HEALTH STUDY

A 1993 study titled "the incidence of dementia and intake of animal products," found that in a group of over 3,000 individuals, those who ate meat—including those who ate only poultry and fish—had twice the risk of developing dementia compared to vegetarians.

Giem, et al. (1993). Neuroepidemiology, 12(1), 28–36.

"Dietary fats and the risk of incident Alzheimer's disease"

THE CHICAGO HEALTH AND AGING PROJECT

Longitudinal study, 2500 older adults, those who consumed ***higher amounts of saturated and trans fatty acids*** *over a six-year period had a* ***higher risk of developing Alzheimer's****, while those eating fats derived from plants had a lower risk.*

Morris, et al. (2003). Archives of Neurology, 60(2), 194–200.

“Midlife Serum Cholesterol and Increased Risk of Alzheimer’s and Vascular Dementia Three Decades Later”

KAISER PERMANENTE NORTHERN CALIFORNIA GROUP

*9,900 patients, individuals with **high cholesterol** during midlife had a **57% higher risk** of developing Alzheimer's disease later on. Even **borderline high cholesterol** increased the risk of Alzheimer's by **23%.***

Solomon, et al. (2009). Dementia and Geriatric Cognitive Disorders, 28(1), 75–80.

"Dietary fat types and 4-year Cognitive Change in Community-Dwelling Older Women"

WOMEN'S HEALTH STUDY

- *Nearly 6,000 women followed over 4-years*
- *Higher saturated fat intake was associated with a poor trajectory of cognition – specifically a **faster decline in memory by 70%***
- *Women with the **lowest saturated fat intake** had the **brain function of women six years younger***

Okereke, et al. (2012). *Annals of Neurology, 72*(1), 124–134.

"Mind Diet Associated with Reduced Incidence of Alzheimer's Disease"

RUSH UNIVERSITY MEMORY AND AGING PROJECT

- *1000 patients - ages 58-98*
- *Strict adherence to the MIND diet (promotes plant-based diet, limits meat and dairy) resulted in a **53 percent reduction in risk for Alzheimer's**.*
- *Even **moderate adherence** to the diet was associated with a **35 percent risk reduction**.*
- *Participants who showed high adherence to the diet had **cognitive functioning equivalent to a person who was seven and a half years younger**.*

Morris, et al. (2015). Alzheimer's & Dementia, 11(9), 1007–1014.

"Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) : 2-Year Intervention Targeting Several Lifestyle and Vascular Risk Factors Simultaneously."

1260 PARTICIPANTS, AGES 60-77 RANDOMIZED TO INTERVENTION OR CONTROL

1) *Dietary guidance*
2) *Physical activity*
3) *Cognitive training and social activities*
4) *Intensive monitoring and management of metabolic and vascular risk factors.*

THE CONTROL GROUP RECEIVED REGULAR HEALTH ADVICE.

Ngandu, et al. (2015). Lancet, 385, PP2255-2263

"Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) : 2-Year Intervention Targeting Several Lifestyle and Vascular Risk Factors Simultaneously."

FINGER DIET: recommendation of high consumption of fruit and vegetables, consumption of wholegrain cereal products, limiting of sucrose intake to less than 50 g/day, use of vegetable margarine and rapeseed oil instead of butter, and fish consumption at least two portions per week **OR** fish oil supplementation.

*Significant beneficial intervention effect on overall cognitive performance. The beneficial effect was seen on **each** cognitive domain: memory; executive function, and psychomotor speed.

*First large RCT showing that it is possible to prevent cognitive decline using a multidomain intervention among older at-risk individuals.

Ngandu, et al. (2015). Lancet, 385, PP2255-2263

BEST AND WORST FOODS FOR YOUR BRAIN!

The Top Ten

- leafy greens
- whole grains
- seeds
- beans
- berries
- nuts
- crucifers
- teas
- herbs and spices
- mushrooms

The Bottom Ten

- pastries and sweets
- processed foods
- processed meats
- red meat
- chicken
- butter and margarine
- fried/fast food
- cheese
- sugary drinks
- excessive alcohol

YOUR BRAIN LOVES THE GYM

(OR SIDEWALK, BIKE TRAIL, POOL,...)

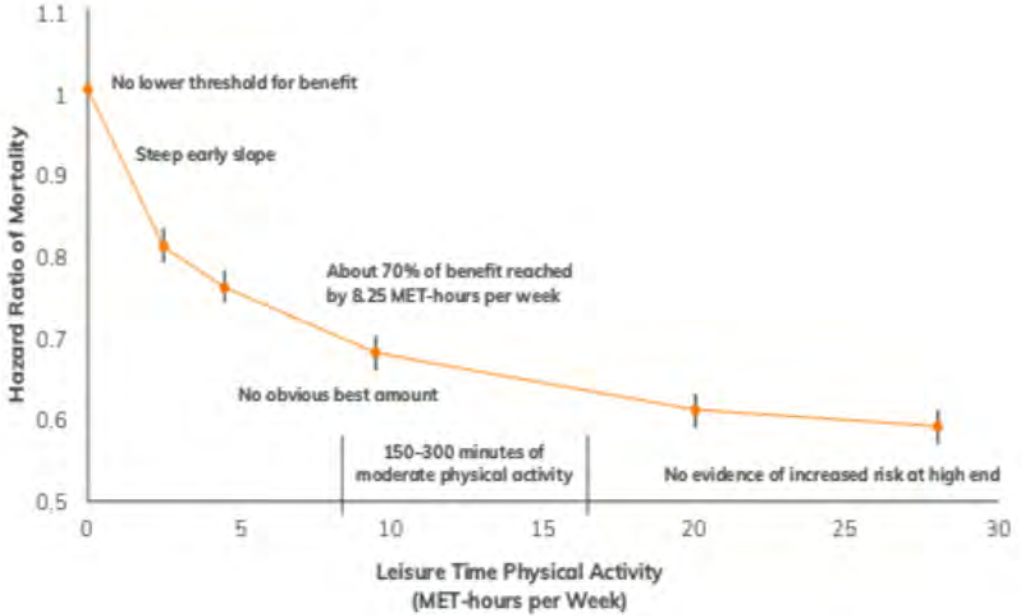
THE EFFECT OF AEROBIC ACTIVITY ON COGNITIVE HEALTH

- 2010 **meta-analysis** of 34,000 people:
  - high intensity physical activity reduced risk of cognitive decline by 38% and moderate activity by 35%
- 639 pts at **Univ. of Lisbon** followed every 3 yrs:
  - exercisers had 40% reduction in Alzheimer's or other dementias
- **Harvard study** of 18,000 women:
  - walking 15" six days weekly delayed cognitive decline and risk of Alzheimer's
- **Univ. of Pittsburgh**:
  - regular walkers had larger brain volumes and better cognitive function

EXERCISE FREQUENCY AND RELATIVE RISK OF ALL CAUSE MORTALITY

"Even low amounts of moderate-to-vigorous intensity physical activity reduce the risk of all-cause mortality.

A large benefit occurs when a person moves from being inactive to being insufficiently active."



Source: Adapted from data found in Moore SC, Patel AV, Matthews CE. Leisure time physical activity of moderate to vigorous intensity and mortality: a large pooled cohort analysis. PLoS Med. 2012;9(11):e1001335. doi:10.1371/journal.pmed.1001335.

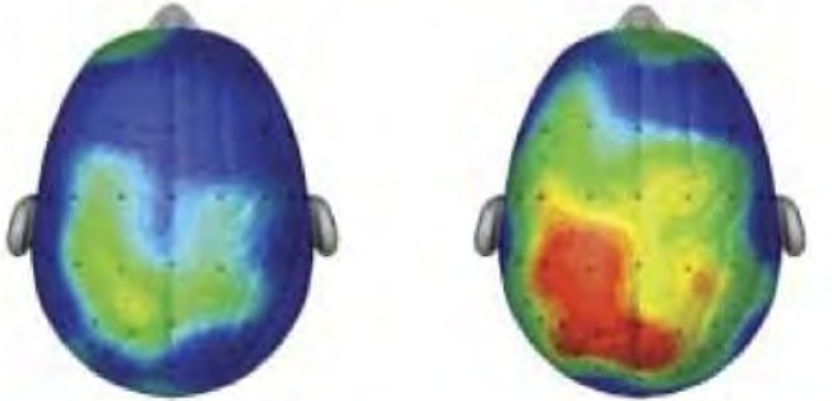
Piercy KL, Troiano RP, Ballard RM, et al. The physical activity guidelines for Americans. *Jama.* 2018;320(19):2020-2028.

Most Active

Least Active

Cognitive Effects of Exercise in Preadolescent Children

Average composite of 20 students' brains taking the same test after sitting quietly or taking 20 minute walk



Brain after sitting quietly

Brain after 20 minute walk

Source: Derived from research by Dr. C.H. Hillman, University of Illinois at Urbana, Champaign, Urbana, IL (2009).

Hillman CH, Buck SM, Themanson JR, Pontifex MB, Castelli DM. Aerobic fitness and cognitive development: Event-related brain potential and task performance indices of executive control in preadolescent children. *Developmental psychology.* 2009;45(1):114.

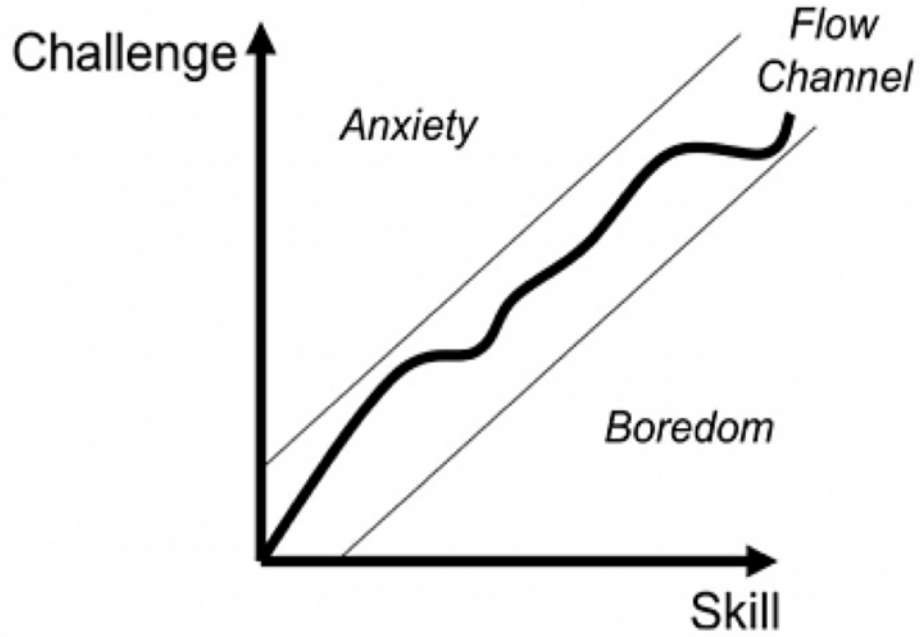
UNWIND

STRESS AND THE BRAIN

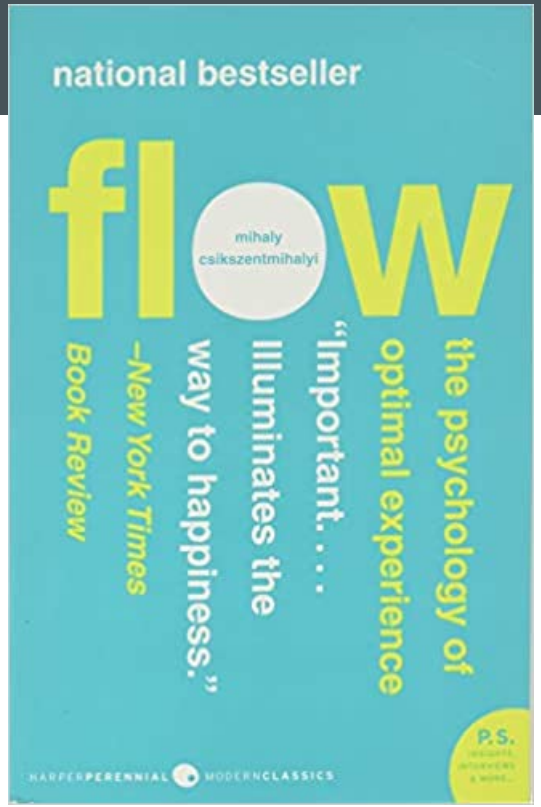
STRESS AND THE BRAIN

- Eustress vs distress

EUSTRESS = FLOW
MIHALYI CSIKZENTMIHALYI



"Flow" concept by Mihaly Csikszentmihalyi. Drawn by Senia Maymin.



STRESS AND THE BRAIN

- Eustress vs distress
- The lion is not our stressor → cortisol


JAY FIRE
Shehan Gunasekara

STRESS AND THE BRAIN

- Eustress vs distress
- The lion is not our stressor→cortisol
- Physiology of impaired cognitive function

INCREASED STRESS = INCREASED CORTISOL

- Impaired cognitive performance
- Dampened thyroid function
- Blood sugar imbalances, such as hyperglycemia
- Decreased bone density
- Decreased muscle mass
- Elevated blood pressure
- Lowered immune function
- Slow wound healing
- Sleep disruption

EFFECTS OF UNCONTROLLED STRESS

- Anxiety and depression
- Impaired attention
- Increased inflammation and oxidation
- Shrinking of the brain!
- Increase beta-amyloid
- Disruption of healthy lifestyle behaviors

OPTIONS FOR MANAGING STRESS TO IMPROVE BRAIN FUNCTION

- Meditation
  - Two recent studies at UCLA and Pittsburgh found an association b/w meditation and increased brain volume
- Yoga
- Music
- Walking
- Purpose
- Meaningful Relationships

RESTORE

RESTFUL SLEEP!

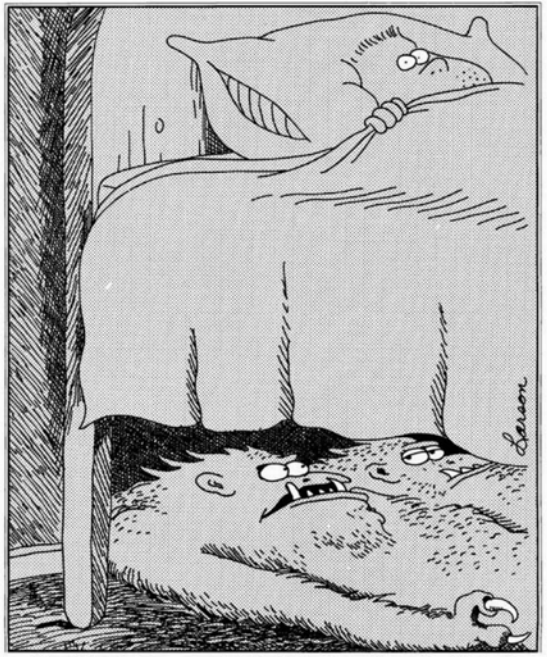
WHAT HAPPENS WHEN WE SLEEP?

1. We cool the brain and body
2. We regulate and rebalance ion channels
3. We optimize physiologic growth
4. We reduce inflammation
5. We improve mood and regulate emotion
6. We protect our hearts
7. We enhance neuroplasticity
8. We consolidate memories
9. We replete energy stores
10. We connect physically, mentally and emotionally

SLEEP HONORS HEALTH AND HEALING!

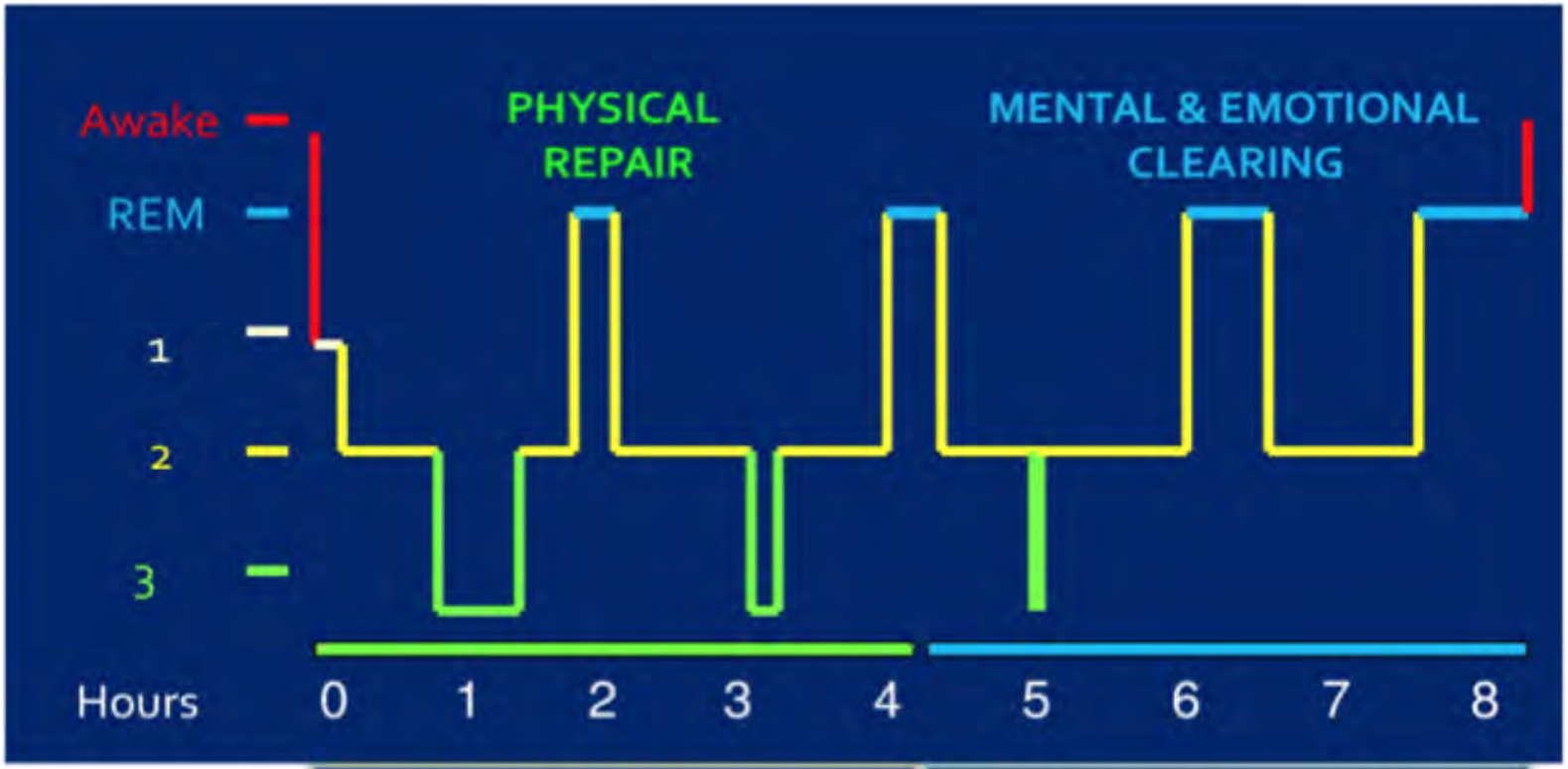
STAGES OF SLEEP

- **Stage 1** – onset of sleep when transitioning from wakefulness to sleep.
- **Stage 2 (*light sleep*)** – usually lasts 20 minutes, humans spend ~40-50% in this stage
- **Stage 3 (*deep sleep*)**– known as slow-wave sleep and delta sleep
- **Stage *REM*** – individuals enter this stage about 90 minutes after initially falling asleep, episodes throughout the night for a total of 1.5-2 hours total



"I've got it again, Larry . . . an eerie feeling like there's something on top of the bed."

NORMAL SLEEP CYCLE:

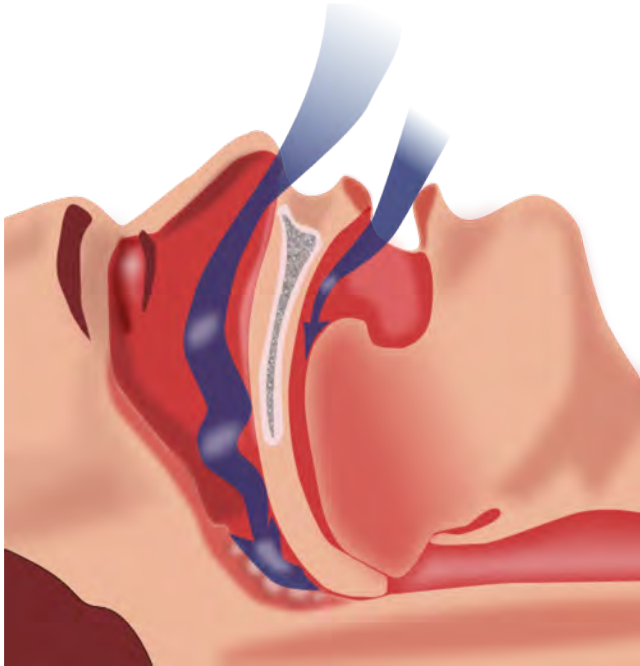


Declarative Memory
Filtering Data
"Just the Facts"

Making Connections
Creativity
Problem Solving

SLEEP APNEA

- The upper airway becomes blocked during sleep (partially or completely).
- Normal breathing is interrupted for short periods of time which can decrease oxygen levels in the blood.
- Then this wakes the person up.
- It can happen 1 to 100 times in an hour.
- This causes severe daytime sleepiness.
- Also—it is associated with high blood pressure and risk of stroke and heart attack.
- Causes: overweight and obesity, smaller than normal inner throat, and other subtle bone and soft tissue differences.



HEALTHY SLEEP HABITS

- Try and maintain a regular sleep schedule
  - Consistent bedtime and wake time 7 days/week
- Relaxing bedtime routine
  - Read a book, meditate, yoga, bath, …
- Avoid stimulants
  - Avoid caffeine and nicotine
- Good sleep environment
  - 60-70 degrees, clean, have a good mattress since you spend a third of your life on it

HEALTHY SLEEP HABITS

- Block out noise and light
  - Needs to be dark and quiet. Use blackout shades, sleep mask, earplugs, white noise, etc as needed
- Only sleep and intimacy
  - Avoid TV and device. Train brain that bed is for sleep
- Exercise and daylight
  - Best for sleep is exercise outside in the morning for both light exposure and energy expenditure
- Eat well
  - Avoid heavy, fatty, fried and spicy foods just before bedtime

OPTIMIZE

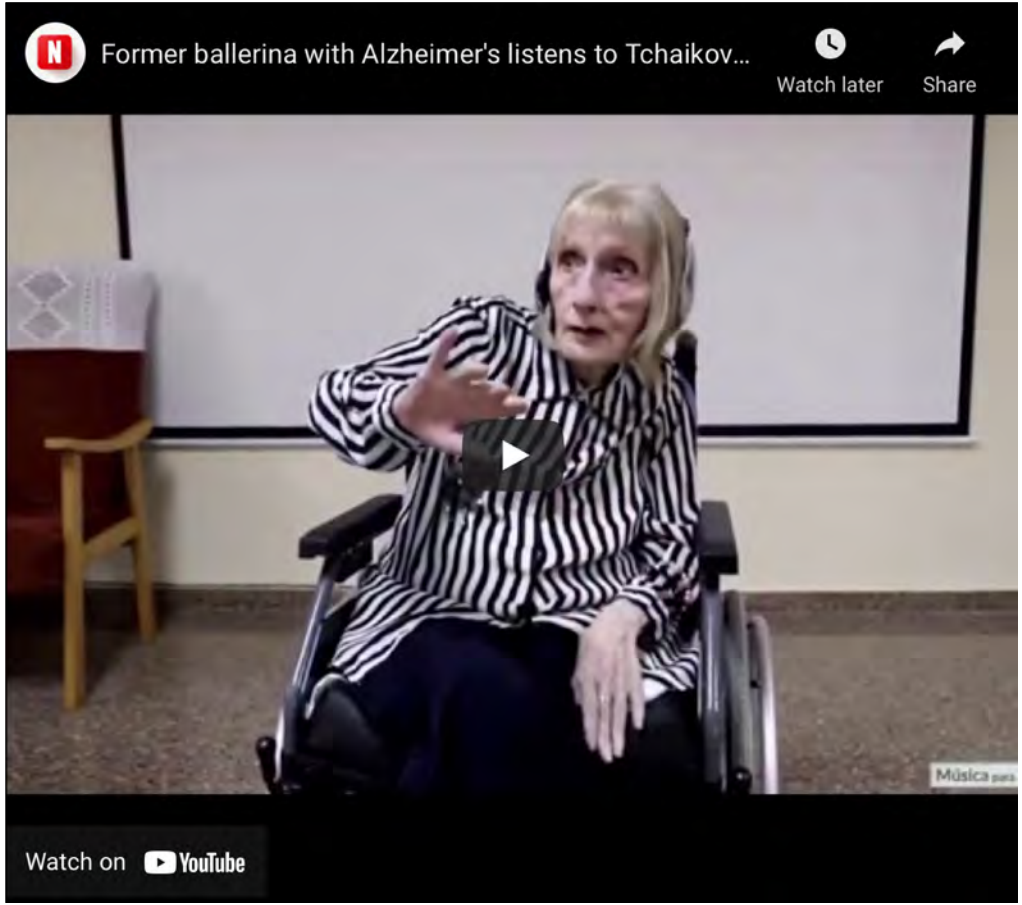
MAKING COMPLEX CONNECTIONS

THE BRAIN'S DOMAINS

- Attention and concentration
- Emotional processing
- Executive function
- Language
- Motor speed and coordination
- Visual/visuospatial
- etc

OPTIMIZE COMPLEX NEURAL CONNECTIONS

- 2003 NEJM study showed lower risk of dementia in dancers and musicians
- 2006 University College in London: taxi drivers had more hippocampal grey matter than bus drivers
- 2014 study at Ghent University: lifelong bilingualism could delay the onset of dementia by ~4 ½ years
- 2016 study from Alzheimer's Disease Research Center: complex jobs offer protection from dementia


Former ballerina with Alzheimer's listens to Tchaikov...
Watch later
Share
Watch on YouTube

ACTIVITIES THAT BUILD COGNITIVE RESERVE

- Learn a new language
- Learn a musical instrument
- Write a book
- Learn to dance
- Join a chess club or group card game
- Volunteer to teach
- Take courses through OLLI or a community college

SUMMARY

- Alzheimer's dementia is a devastating, complex neurological disease with inflammation, oxidation, and lipid and glucose dysregulation at its core
- Healthy lifestyle behaviors address each of these pathways
- A personalized lifestyle plan is simply good medicine for preventing and treating this disease

Someone has to stand up and say that the answer isn't another pill. The answer is spinach

-Bill Maher