OPTIMIZE YOUR BRAIN HEALTH WITH LIFESTYLE MEDICINE

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OBJECTIVES

EDUCATE ABOUT	EDUCATE ABOUT THE PILLARS OF LIFESTYLE MEDICINE
IDENTIFY	IDENTIFY RELATIONSHIP BETWEEN DEMENTIA AND LIFESTYLE BEHAVIORS
LEARN	LEARN HOW TO PREVENT DEMENITA UTILIZING THE PILLARS OF LIFESTYLE MEDICINE

Lifestyle Medicine Defined

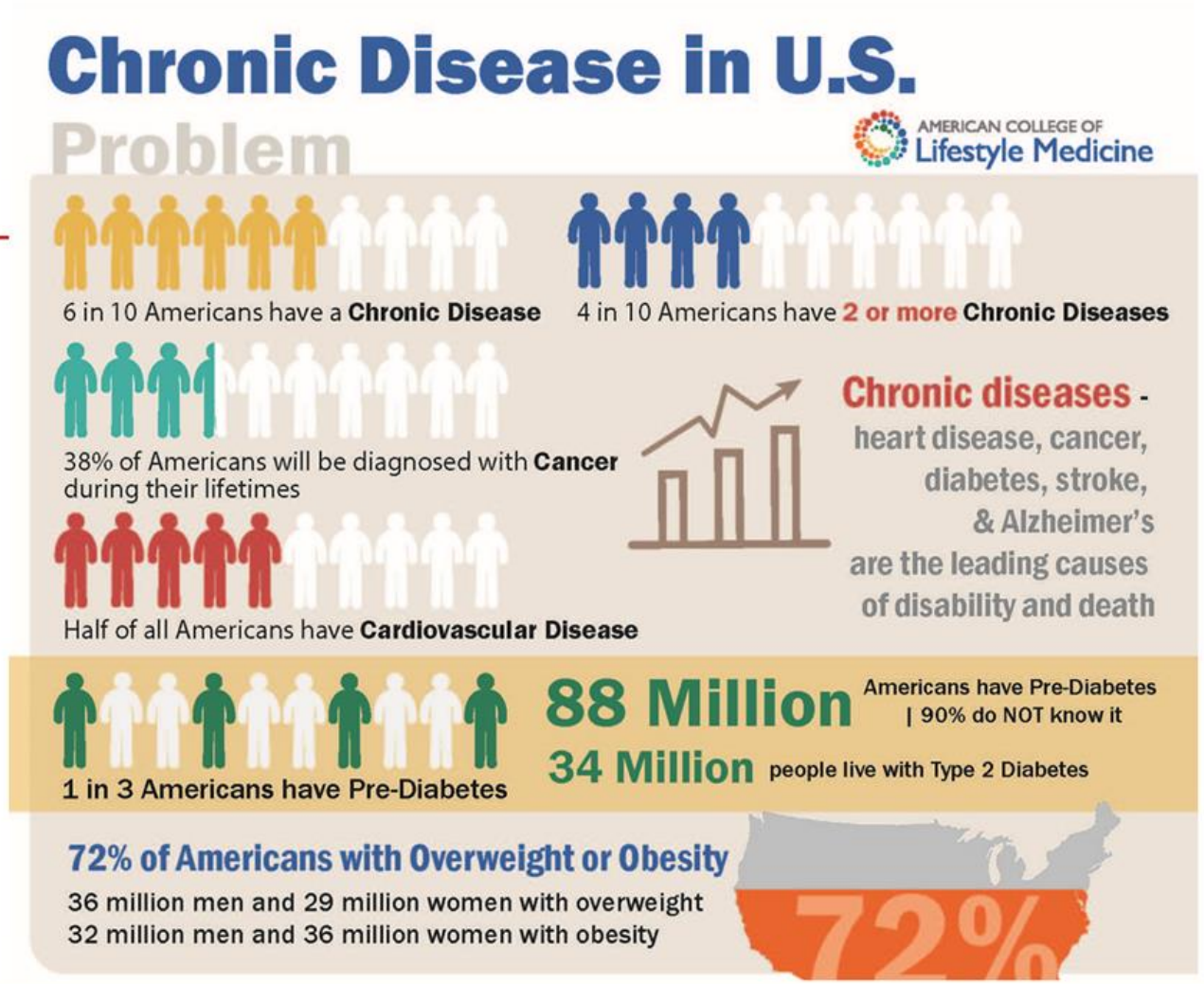
Lifestyle Medicine is the use of a whole food, plant-predominant dietary lifestyle, regular physical activity, restorative sleep, stress management, avoidance of risky substances and positive social connection as a primary therapeutic modality for treatment and reversal of chronic disease.

Simple, Powerful Therapy

- **NUTRITION**: Choose predominantly whole, plant-based foods that are fiber-filled, nutrient dense, health-promoting and disease-fighting
- **SLEEP:** Lack of, or poor-quality sleep can lead to a strained immune system. Identify and alter environmental habits that may hinder healthy sleep
- **EXERCISE:** Regular and consistent physical activity is an essential piece of an optimal health equation
- **SUBSTANCE USE:** The well-documented dangers of any addictive substance use can increase risk for many cancers and heart disease
- **STRESS MANAGEMENT:** Identify both positive and negative stress responses with coping mechanisms and reduction techniques for improved wellbeing
- **SOCIAL CONNECTION:** Being connected to others is essential to emotional resiliency and overall health

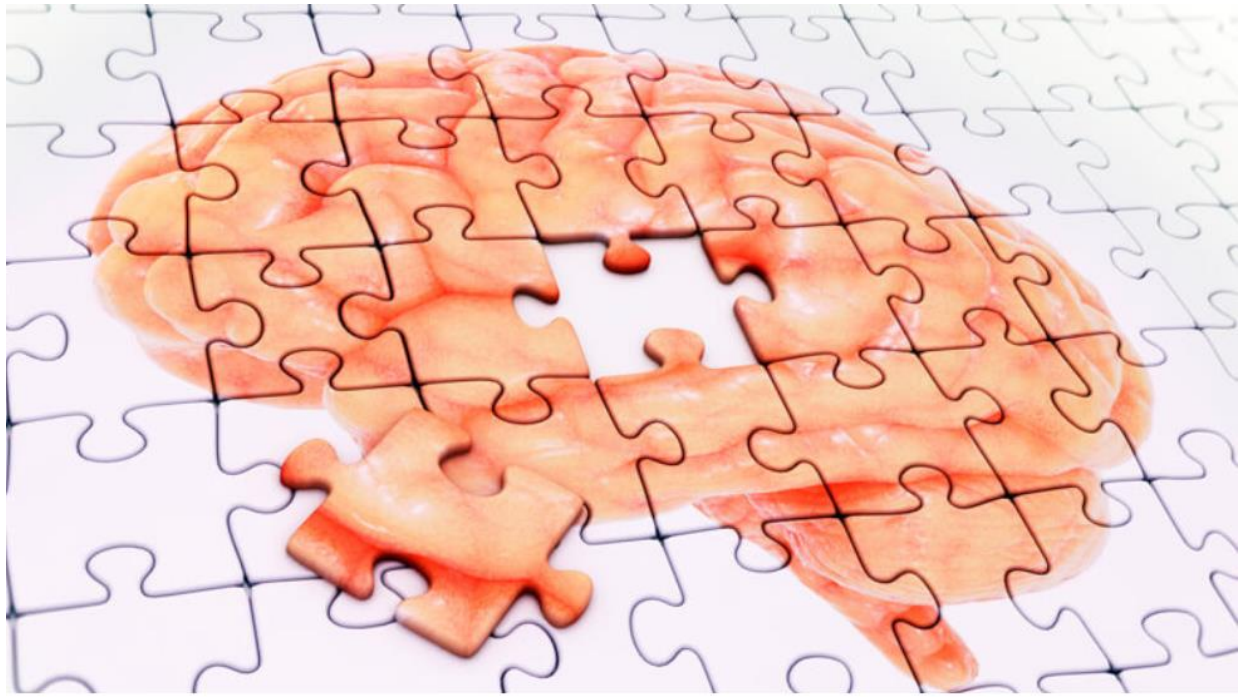
Epidemic

- Healthcare in US costs $3.3 trillion annually
- 90% of these costs are attributed to the treatment of chronic conditions
- Lifestyle Medicine addresses the **root cause** to both improve health & reduce costs



What We Know

- 70% of all deaths are due to chronic diseases of our own making.
- An estimated 90% of type 2 diabetes, 80-90% of heart disease and 40-70% of cancers are considered entirely preventable.



CAN LIFESTYLE CHANGES HELP PREVENT COGNITIVE DECLINE/DEMENTIA?

Scope of the Epidemic (U.S.)[1]

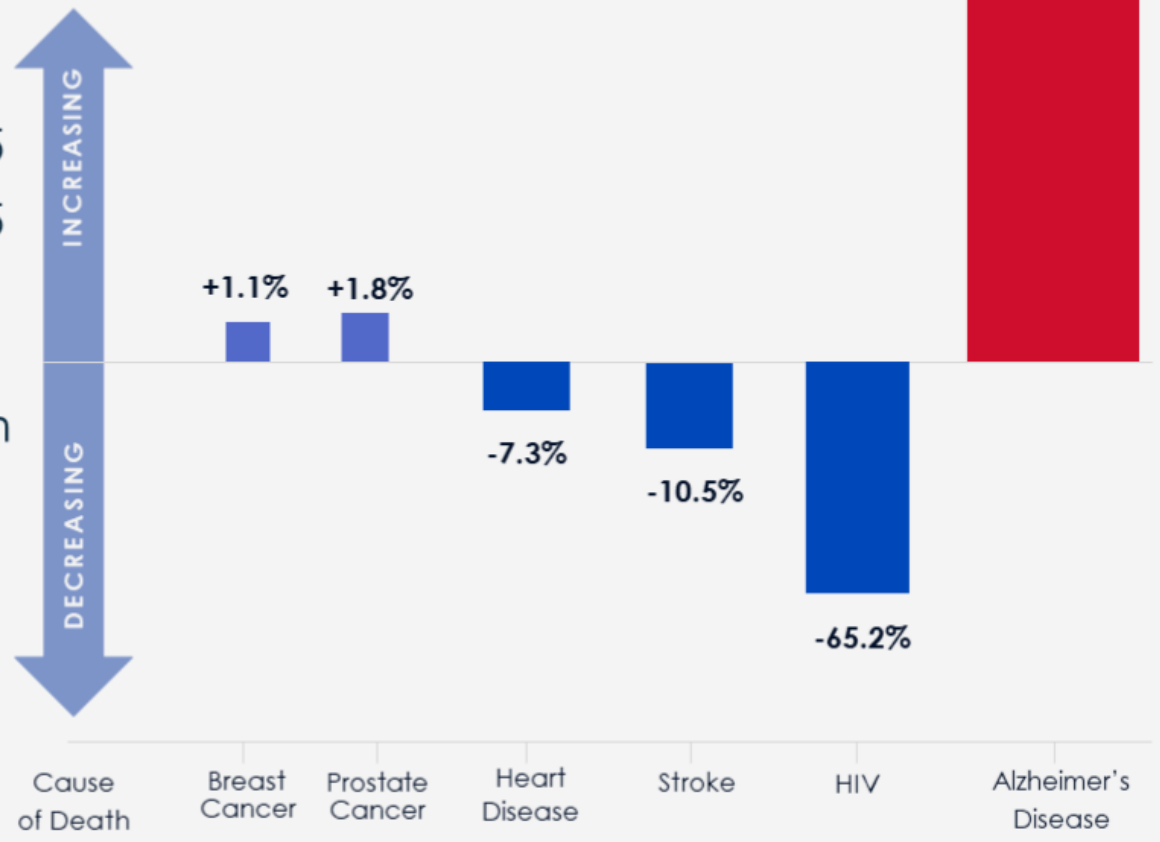
6.5 million adults

1 in 9 adults age ≥65

1 in 3 adults age ≥85

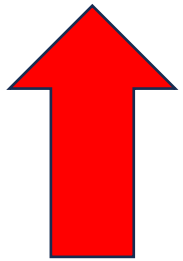
2/3 are women

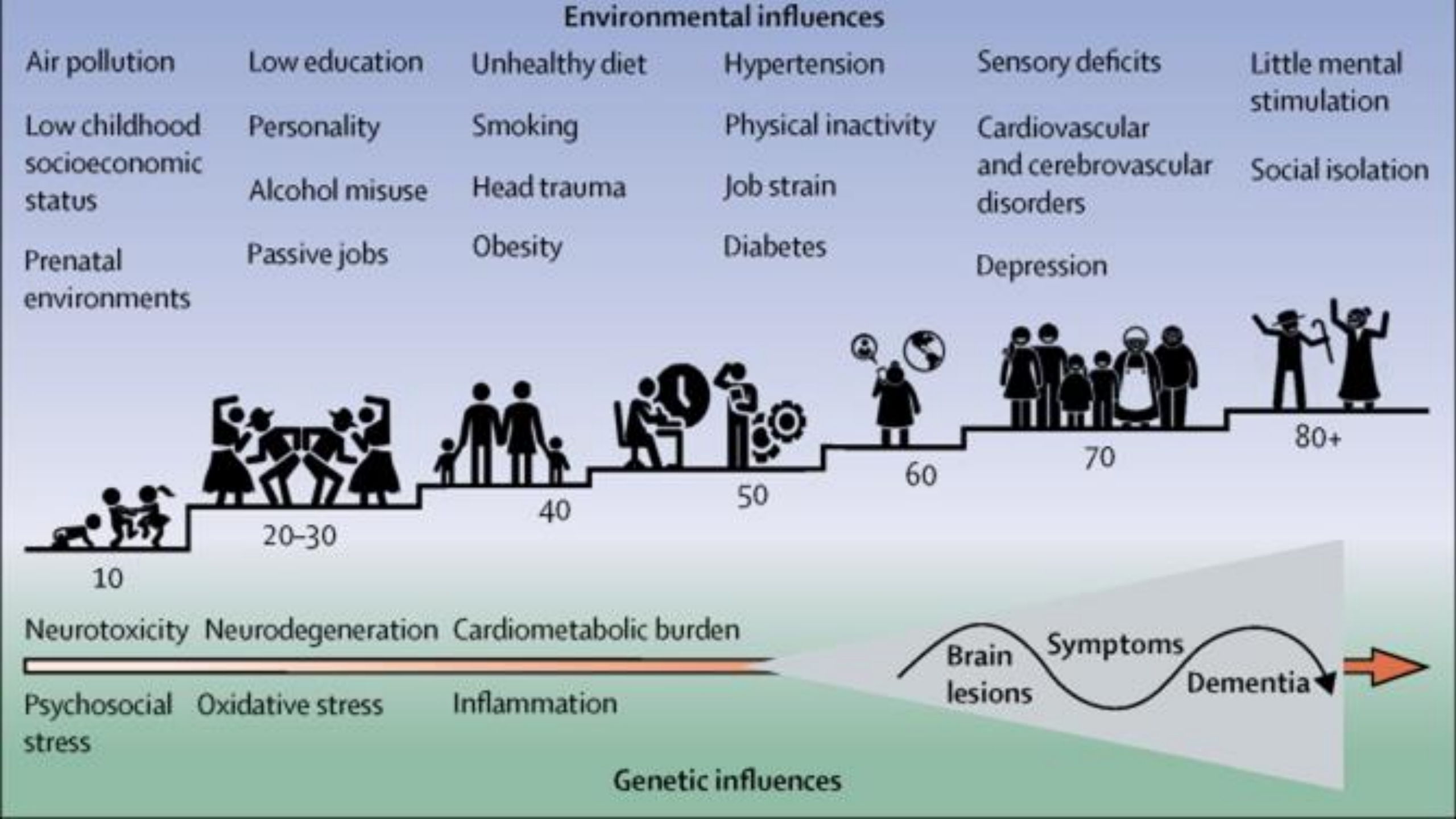
Alzheimer's deaths increased 145% from 2000-2019, while other top causes of death have declined



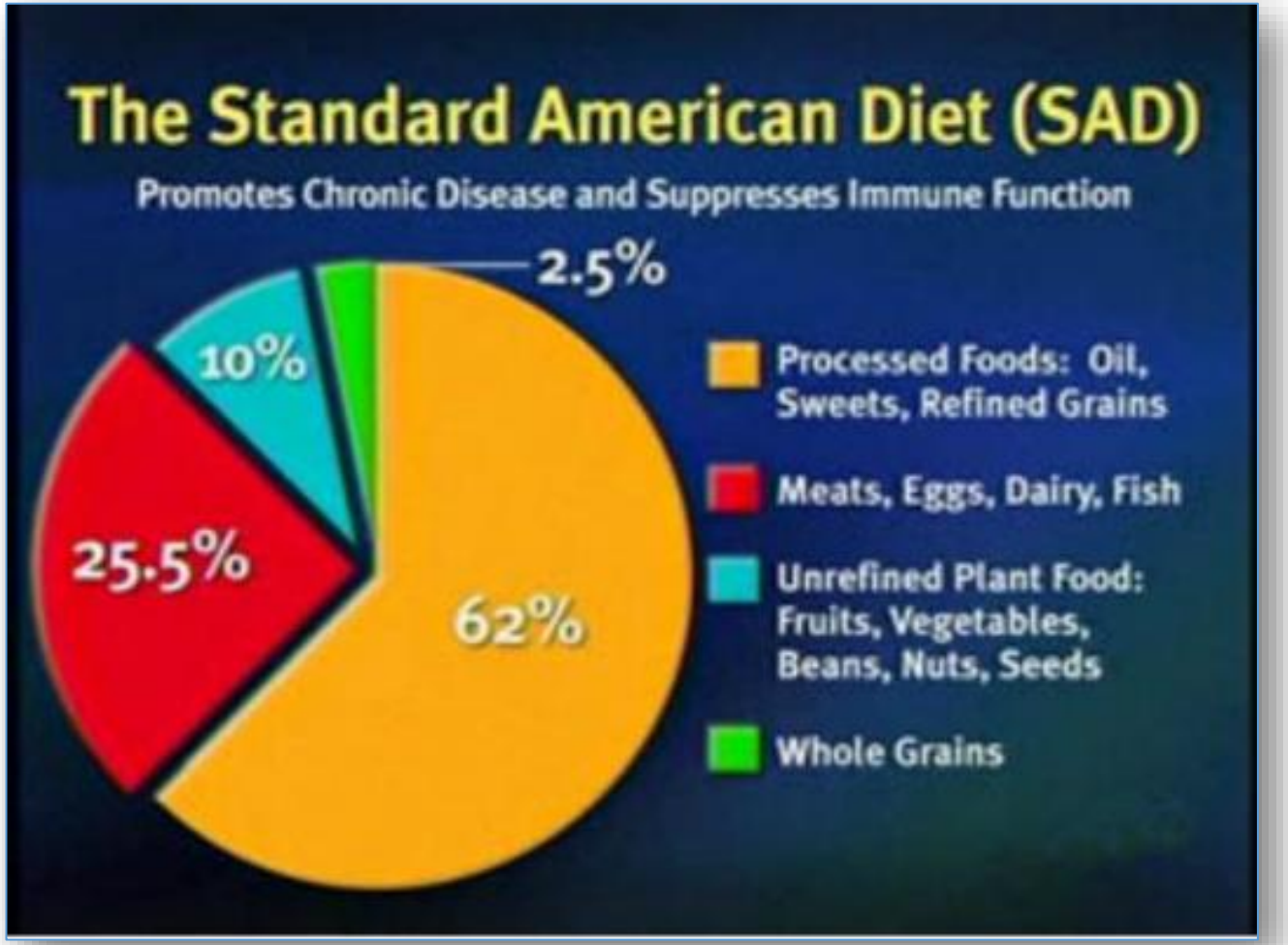
Statistics

- By **2050**, the **number of people** age 65 and above with Alzheimer's dementia is projected to reach **13.8 million**




Environmental influences
Air pollution
Low childhood socioeconomic status
Prenatal environments
Low education
Personality
Alcohol misuse
Passive jobs
Unhealthy diet
Smoking
Head trauma
Obesity
Hypertension
Physical inactivity
Job strain
Diabetes
Sensory deficits
Cardiovascular and cerebrovascular disorders
Depression
Little mental stimulation
Social isolation
10
20–30
40
50
60
70
80+
Neurotoxicity
Neurodegeneration
Cardiometabolic burden
Psychosocial stress
Oxidative stress
Inflammation
Brain lesions
Symptoms
Dementia
Genetic influences

PILLAR #1-NUTRITION


The Standard American Diet (SAD)
Promotes Chronic Disease and Suppresses Immune Function
2.5%
10%
25.5%
62%
Processed Foods: Oil, Sweets, Refined Grains
Meats, Eggs, Dairy, Fish
Unrefined Plant Food: Fruits, Vegetables, Beans, Nuts, Seeds
Whole Grains

Healthy Brain

- PUFAs
- MUFAs
- Omega 3 & 6
- Mediterranean Diet

↑ BDNF
↓ Inflammation
↑ Insulin sensitivity

Exercise

- Polyphenols
- Antioxidants
- MIND/DASH diet

Alzheimer's Disease

↓ BDNF
↑ Inflammation
↓ Insulin sensitivity

- SFA
- Simple carbohydrates

Sedentary Lifestyle

- Obesity
- Western Diet

https://doi.org/10.1139/apnm-


Omega 3 Rich Foods
Soybean
Canola Oil
Mackerel
Flaxseed
Kidney Beans
Chia Seeds
Walnut
Spinach
Salmon

10 Plant Foods High in Omega 3

Black walnuts

Berries

Hemp seeds

Chia seeds

Leafy greens

Edamame

Winter squash

Flax seeds

Brassica vegetables

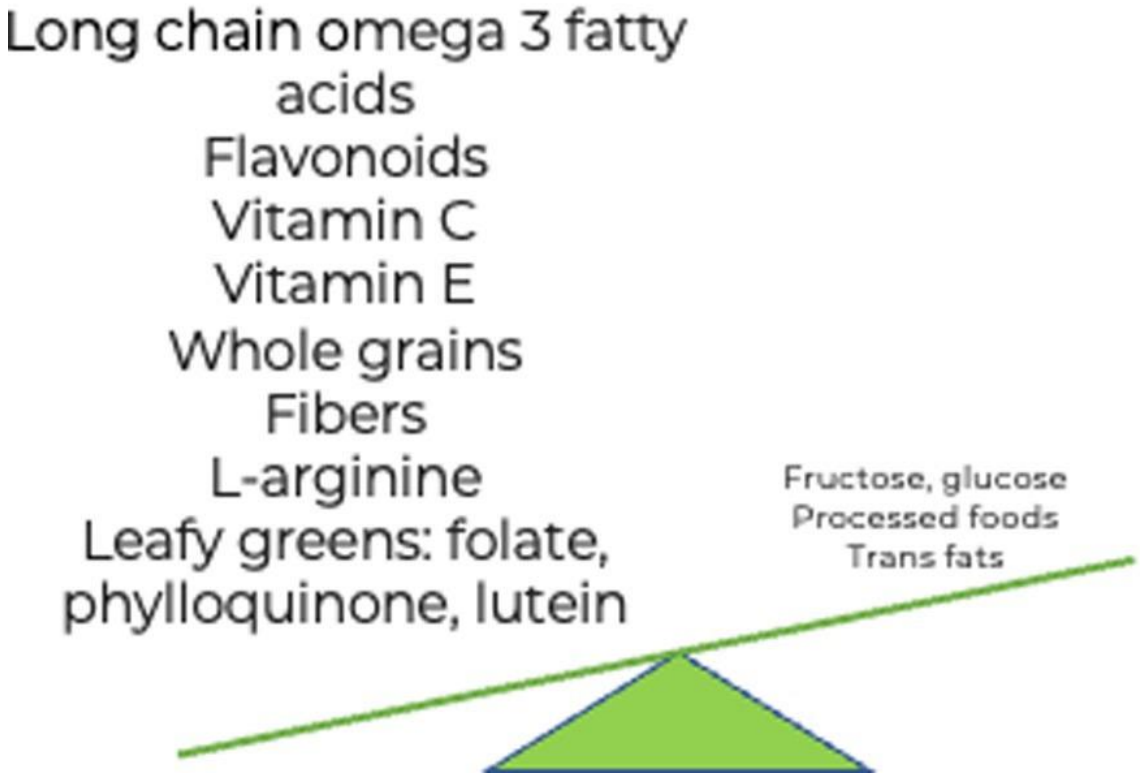
Beans

TheVeganJunction.com

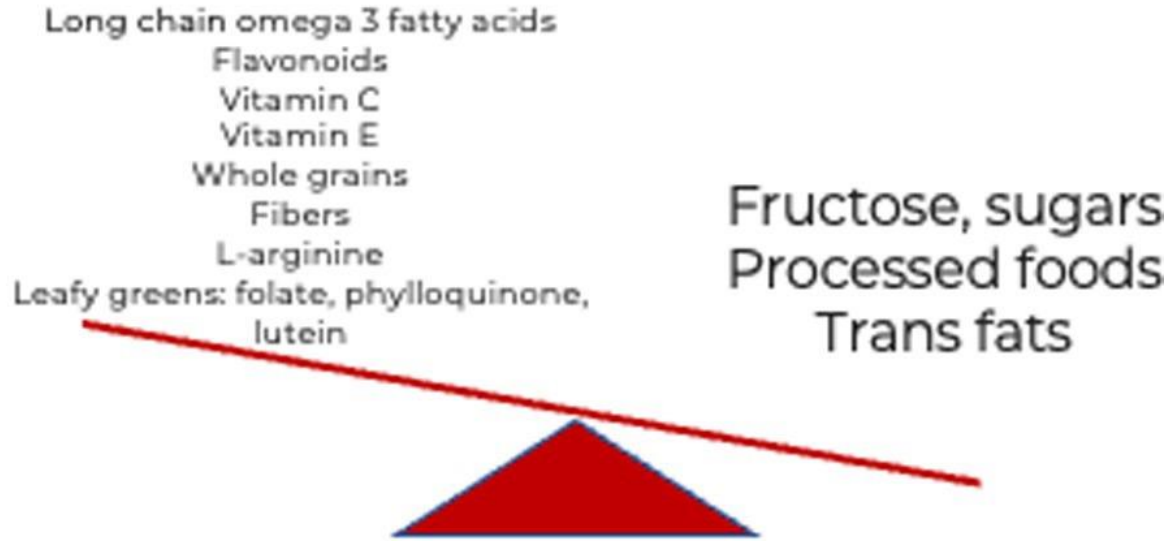
MIND DIET

- Developed by Martha Clare Morris (Rush University)
- Hybrid of the Mediterranean and DASH diets
- 10 Brain-Healthy Food Groups
- 5 Brain Unhealthy Food Groups

Healthy -Mediterranean, DASH, MIND



Dementia Risk- Western Diet



https://doi.org/10.3389/fnut.2023.1213223

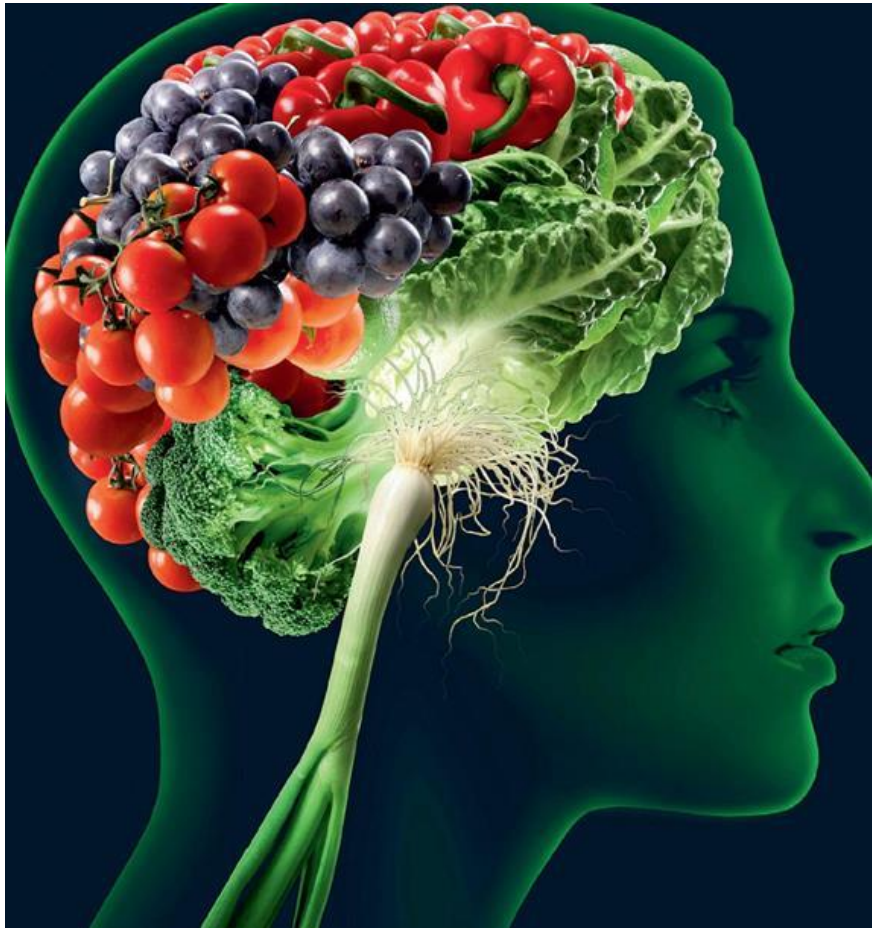
	The Mediterranean Diet	The DASH diet	The MIND diet
Overview	Minimally processed, plant-based diet based on the traditional diet of individuals living in the Mediterranean region	Minimally processed, plant-based dietary intervention for cardiometabolic conditions	Minimally processed, plant-based dietary intervention for cognitive decline and certain age-related neurodegenerative conditions
Includes	Extra virgin olive oil Fruit Legumes Nuts and seeds Vegetables Whole grains Lean meats (e.g., chicken, turkey), fish, dairy, and red wine in moderation	Fruit Lean meat (e.g., poultry, turkey, fish) Low-fat dairy Nuts Vegetables Whole grains	Beans Berries Extra virgin olive oil Fish Green leafy vegetables Nuts Poultry Vegetables (all other) Whole grains Wine ?
Excludes/ limits	Red meat Refined and processed foods Sugars	Fat intake Red meat Sugar-containing beverages Sweets	Butter and stick margarine Cheese Fried or fast foods Red meats (e.g., beef, pork) Sweets

Mind Diet Associated With Reduced Incidence of Alzheimer's Disease[17]

- 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% reduction in risk for Alzheimer's.
- Even moderate adherence to the diet was associated with a 35% 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.

Lifestyle Medicine Interventions & Dementia



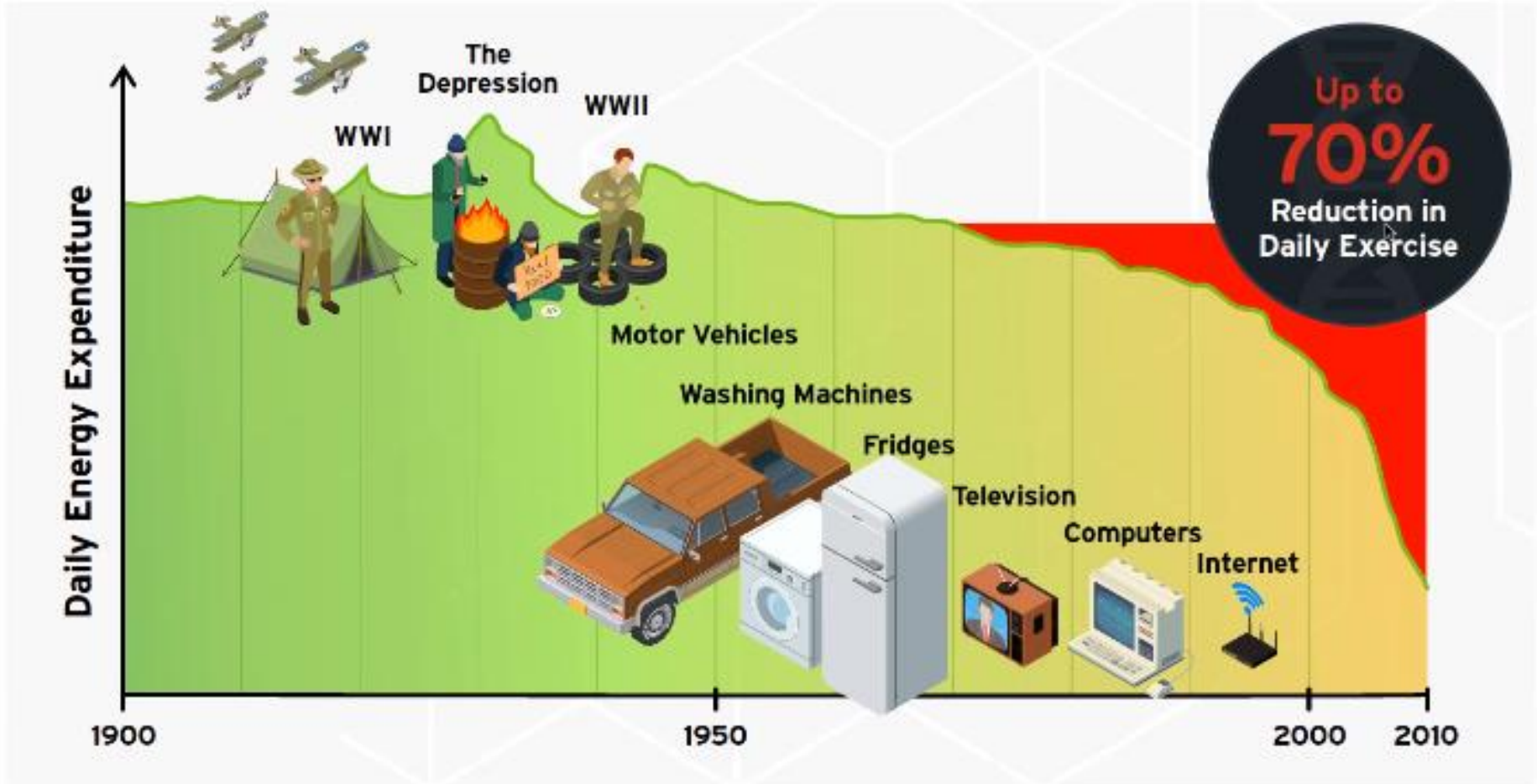
- 51 subjects w/mild CBI or early stage dementia
- 26 subjects assigned to intervention for 20wks
  - WFPB Dietary Pattern
  - Moderate aerobic exercise/strength training for 30min/day
  - Stress Management practice for 1hr/day
  - Online support group for participants and partners for 1hr sessions/3x per week

Ornish, D., Madison, C., Kivipelto, M. *et al.* Effects of intensive lifestyle changes on the progression of mild cognitive impairment or early dementia due to Alzheimer's disease: a randomized, controlled clinical trial. *Alz Res Therapy* **16**, 122 (2024). https://doi.org/10.1186/s13195-024-01482-z

RESULTS

- Significant improvement in 3 cognition test assessments:
  - CGIC
  - CDR-SB
  - CDR Global
- Borderline Significant improvement:
  - ADAS-Cog test
- Improved Gut Microbiome
- Increased A*B*42/40 ratio

PILLAR #2- EXERCISE



Vogels et al. (2004). Int J Sports Med.

ACSM and CDC Recommendations

150 minutes of moderate-intensity aerobic activity every week

2X per week Muscle-strengthening activities on 2 or more days a week that work all major muscle groups

ExeRxcise is Medicine® On Campus

Drexel University

https://www.acsm.org/read-research/trending-topics-resource-pages/physical-activity-guidelines

THE ROLE OF EXERCISE

Improves blood flow to the brain

Improves mood, social connectedness & confidence

Increases levels of brain-derived neurotrophic factor for improving memory & learning

Increases connections between nerves

Reduces risk factors of dementia

Improves mental performance & learning

Exercise dramatically reduces Alzheimer's disease incidence

Exercise – how much? 30 min/day 5d/week - moderate levels

→ ~40% reduced risk

Gomes-Osman et al *Neurology* 2018
Guure et al *BioMed Res Int* 2017
WHO guidelines 2019
Jia et al *BMC Geriatrics* 2019

September 6, 2022

Association of Daily Step Count and Intensity With Incident Dementia in 78 430 Adults Living in the UK

Borja del Pozo Cruz, PhD[1]; Matthew Ahmadi, PhD[2]; Sharon L. Naismith, PhD[3]; et al

» Author Affiliations | Article Information

JAMA Neurol. Published online September 6, 2022. doi:10.1001/jamaneurol.2022.2672

Editorial Comment

Related Articles

Key Points

Question Is there a dose-response association of daily step count and intensity with incidence of all-cause dementia among adults living in the UK?

Findings This cohort study of adults assessed with wrist-worn accelerometers found that accruing more steps per day was associated with steady declines in dementia incidence risk, up to 9800 steps per day, beyond which the benefits upturned. The dose associated with 50% of maximal observed benefit was 3800 steps per day, and steps at higher intensity (cadence) were associated with lower incidence risk.

Dementia affects more than 55 million people worldwide and is the seventh leading cause of death globally.

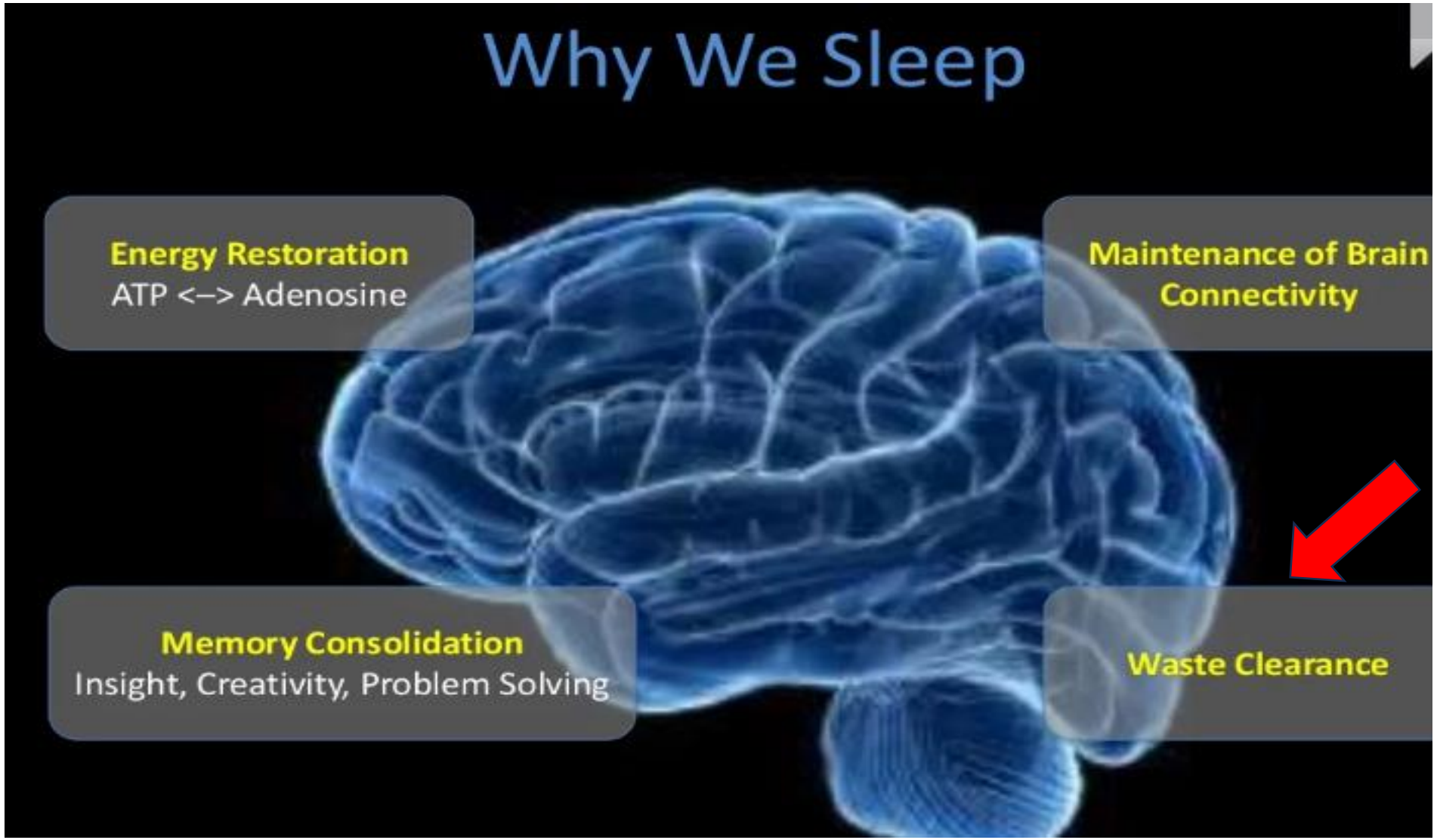
With the proportion of older people in the population increasing, the number of dementia cases is also on the rise.

There is mounting evidence that regular physical exercise not only benefits general health, but is also one of the most effective ways to reduce the risk of developing dementia.

In good news for those who struggle to fit exercise into their daily routine, a new study has shown that walking around 4,000 steps a day may reduce dementia risk by 25%.

Upping their daily step count to just under 10,000 could halve a person's risk of developing dementia.

PILLAR #3-SLEEP


Why We Sleep
Energy Restoration
ATP <–> Adenosine
Maintenance of Brain Connectivity
Memory Consolidation
Insight, Creativity, Problem Solving
Waste Clearance

Article | Open Access | Published: 20 April 2021

Association of sleep duration in middle and old age with incidence of dementia

Séverine Sabia, Aurore Fayosse, Julien Dumurgier, Vincent T. van Hees, Claire Paquet, Andrew Sommerlad, Mika Kivimäki, Aline Dugravot & Archana Singh-Manoux

Nature Communications **12**, Article number: 2289 (2021) | Cite this article

Abstract

Sleep dysregulation is a feature of dementia but it remains unclear whether sleep duration prior to old age is associated with dementia incidence. Using data from 7959 participants of the Whitehall II study, we examined the association between sleep duration and incidence of dementia (521 diagnosed cases) using a 25-year follow-up. Here we report higher dementia risk associated with a sleep duration of six hours or less at age 50 and 60, compared with a normal (7 h) sleep duration, although this was imprecisely estimated for sleep duration at age 70 (hazard ratios (HR) 1.22 (95% confidence interval 1.01–1.48), 1.37 (1.10–1.72), and 1.24 (0.98–1.57), respectively). Persistent short sleep duration at age 50, 60, and 70 compared to persistent normal sleep duration was also associated with a 30% increased dementia risk independently of sociodemographic, behavioural, cardiometabolic, and mental health factors. These findings suggest that short sleep duration in midlife is associated with an increased risk of late-onset dementia.

Highlights of Study

- 7959 Participants in the Whitehall II Study
- Positive Association between Sleep Duration and Incidence of Dementia using a 25year Follow-Up
- Reported Higher Dementia Risk Associated with Sleep Duration of 6 Hours or Less at Age 50 and 60 Compared with a Normal 7 Hour Sleep Duration
- Persistent short sleep duration at age 50, 60, and 70 compared to persistent normal sleep duration was also associated with a 30% increased dementia risk independently of sociodemographic, behavioral, cardiometabolic, and mental health factors.

PILLAR #4-RISKY SUBSTANCES


DRINKING IN MODERATION:
1 drink or less in a day for women
2 drinks or less in a day for men
or nondrinking

- There is **no level of alcohol consumption** that does not increase the risk of dementia among drinkers, according to a new study.

- Using statistical methods based on genetic analyses, the authors of the study found that alcohol heightened dementia risk in proportion to the amount of alcohol consumed.

- This study contradicts earlier research that suggested light to moderate drinking may protect against dementia.

Association between alcohol consumption and incidence of dementia in current drinkers: linear and non-linear mendelian randomization analysis
1.Zheng, Lingling et al.
2.eClinicalMedicine, Volume 76, 102810

PILLAR #5-STRESS MANAGEMENT

Brain. 2010 Aug;133(Pt 8):2217-24. doi: 10.1093/brain/awq116. Epub 2010 May 20.

Midlife psychological stress and risk of dementia: a 35-year longitudinal population study

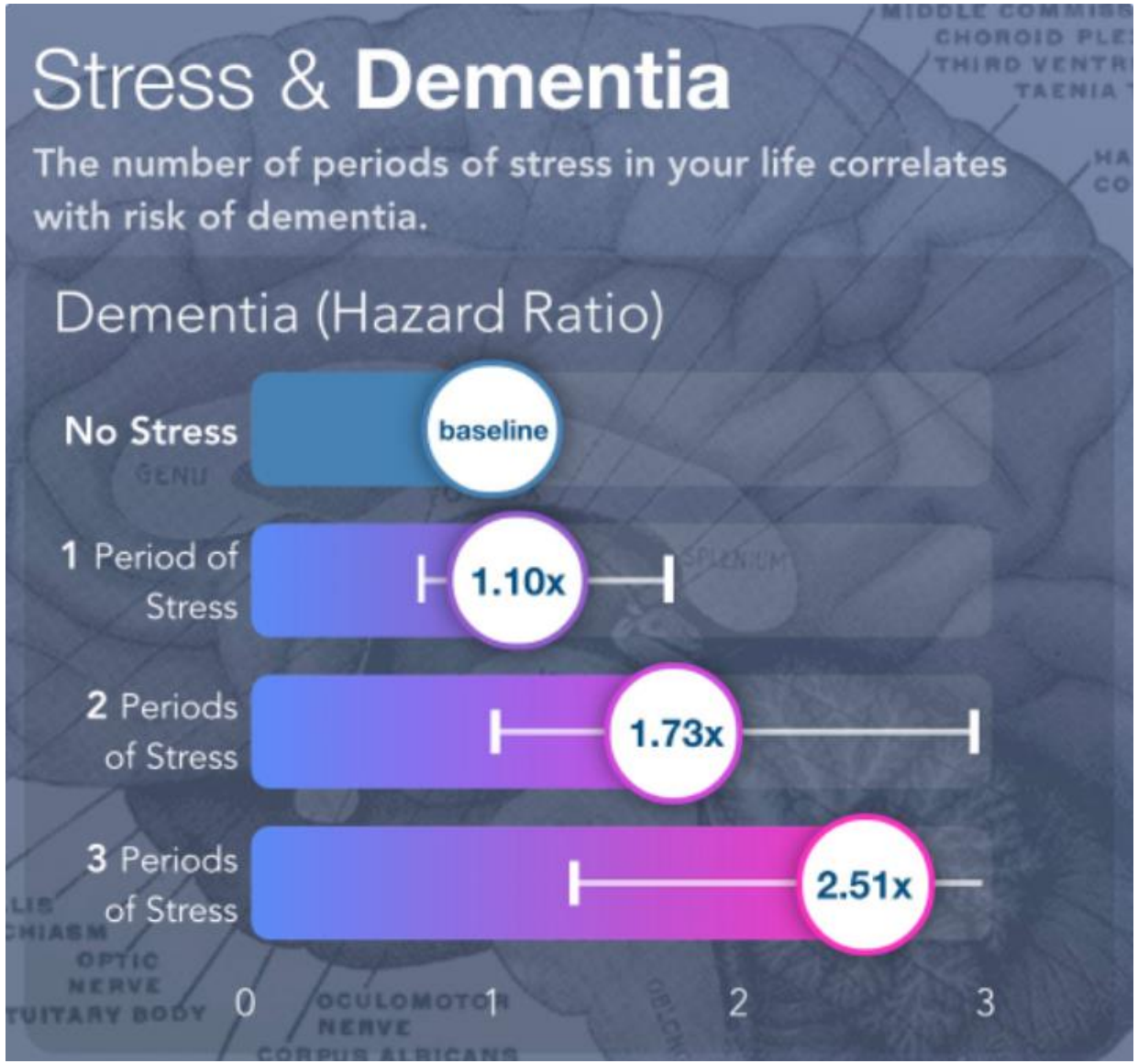
Lena Johansson [1], Xinxin Guo, Margda Waern, Svante Ostling, Deborah Gustafson, Calle Bengtsson, Ingmar Skoog

Affiliations + expand

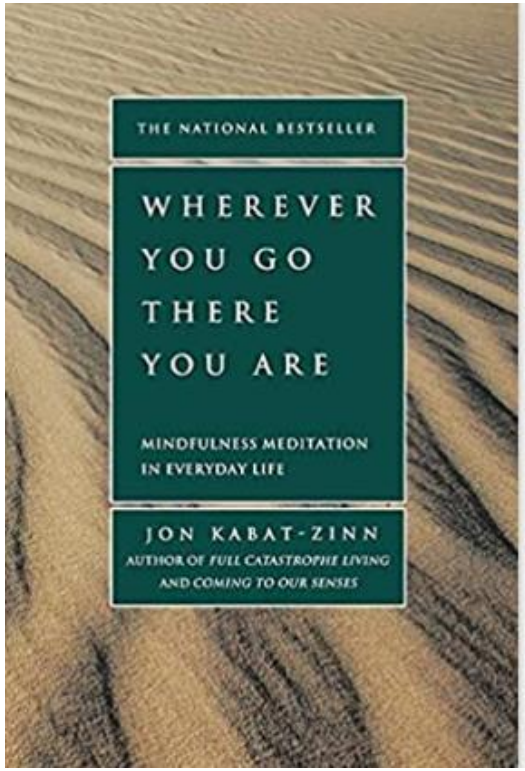
PMID: 20488887 DOI: 10.1093/brain/awq116

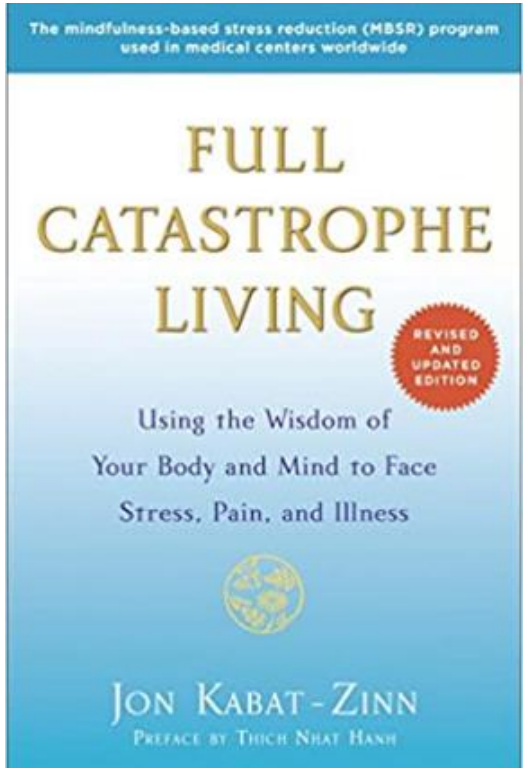
Abstract

The number of people with dementia has increased dramatically with global ageing. Nevertheless, the pathogeneses of these diseases are not sufficiently understood. The present study aims to analyse the relationship between psychological stress in midlife and the development of dementia in late-life. A representative sample of females (n = 1462) aged 38-60 years were examined in 1968-69 and re-examined in 1974-75, 1980-81, 1992-93 and 2000-03. Psychological stress was rated according to a standardized question in 1968, 1974 and 1980. Dementia was diagnosed according to Diagnostic and Statistical Manual of Mental Disorders criteria based on information from neuropsychiatric examinations, informant interviews, hospital records and registry data. During the 35-year follow-up, 161 females developed dementia (105 Alzheimer's disease, 40 vascular dementia and 16 other dementias). We found that the risk of dementia (hazard ratios, 95% confidence intervals) was increased in females reporting frequent/constant stress in 1968 (1.60, 1.10-2.34), in 1974 (1.65, 1.12-2.41) and in 1980 (1.60, 1.01-2.52). Frequent/constant stress reported in 1968 and 1974 was associated with Alzheimer's disease. Reporting stress at one, two or three examinations was related to a sequentially higher dementia risk. Compared to females reporting no stress, hazard ratios (95% confidence intervals) for incident dementia were 1.10 (0.71-1.71) for females reporting frequent/constant stress at one examination, 1.73 (1.01-2.95) for those reporting stress at two examinations and 2.51 (1.33-4.77) at three examinations. To conclude, we found an association


Stress & Dementia
The number of periods of stress in your life correlates with risk of dementia.
Dementia (Hazard Ratio)
No Stress
baseline
1 Period of Stress
1.10x
2 Periods of Stress
1.73x
3 Periods of Stress
2.51x
0
1
2
3


Paying Attention
- listening, watching or considering what naturally exists
On Purpose
- intentionally increasing awareness of experience
Mindfulness
in the Present Moment
- focusing on the here and now
Non-Judgmentally
- being curious and objective about experience





Books by Jon Kabat-Zinn, PhD

PILLAR #6-SOCIAL CONNECTION

THE GERONTOLOGICAL SOCIETY OF AMERICA®

Journals of Gerontology: Psychological Sciences
cite as: *J Gerontol B Psychol Sci Soc Sci*, 2021, Vol. 76, No. 6, 1027–1035
doi:10.1093/geronb/gbaa173
Advance Access publication October 19, 2020

OXFORD

Research Article

Greater Social Engagement and Greater Gray Matter Microstructural Integrity in Brain Regions Relevant to Dementia

Cynthia Felix, MD, MPH,[1,*] Caterina Rosano, MD, MPH,[1] Xiaonan Zhu, PhD,[1] Jason D. Flatt, PhD, MPH,[2] and Andrea L. Rosso, PhD, MPH[1]

[1]Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, Pennsylvania. [2]Department of Environmental and Occupational Health, School of Public Health, University of Nevada Las Vegas.

STUDY HIGHLIGHTS

Older adults who remained more socially engaged showed more robust [illegible] matter in areas related to dementia, a recent study suggests.

Loneliness and isolation have been considered major risk factors for early mortality for seniors

Researchers looked at 293 participants of a larger initiative called the Health, Aging and Body Composition Study, which has collected data since 1997

Averaging about 83 years old, participants receive brain scans and report on habits such as nutrition, social interactions, and physical activity

PILLAR #7-NATURE/FRESH AIR

“Unofficial 7TH Pillar of Lifestyle Medicine

DAILY EXPOSURE TO NATURE/FRESH AIR

JAMA Network | Open

Original Investigation | Environmental Health

Associations of Greenness, Parks, and Blue Space With Neurodegenerative Disease Hospitalizations Among Older US Adults

Jochem O. Klompmaker, PhD; Francine Laden, ScD; Matthew H. E. M. Browning, PhD; Francesca Dominici, PhD; Marcia P. Jimenez, PhD; S. Scott Ogletree, PhD; Alessandro Rigolon, PhD; Antonella Zanobetti, PhD; Jaime E. Hart, ScD; Peter James, ScD

- US-based Cohort Study
- 62 million individuals, age 65 and older
- Greenspace/Bluespace-protected effect on Hospitalizations-Parkinson Disease
- Greenspace-Protective effect on Hospitalizations-Alzheimer Disease

ARTICLE OPEN

How nature nurtures: Amygdala activity decreases as the result of a one-hour walk in nature

Sonja Sudimac[1,2,3]✉, Vera Sale[1,2] and Simone Kühn[1,2,4,5]

Since living in cities is associated with an increased risk for mental disorders such as anxiety disorders, depression, and schizophrenia, it is essential to understand how exposure to urban and natural environments affects mental health and the brain. It has been shown that the amygdala is more activated during a stress task in urban compared to rural dwellers. However, no study so far has examined the causal effects of natural and urban environments on stress-related brain mechanisms. To address this question, we conducted an intervention study to investigate changes in stress-related brain regions as a effect of a one-hour walk in an urban (busy street) vs. natural environment (forest). Brain activation was measured in 63 healthy participants, before and after the walk, using a fearful faces task and a social stress task. Our findings reveal that amygdala activation decreases after the walk in nature, whereas it remains stable after the walk in an urban environment. These results suggest that going for a walk in nature can have salutogenic effects on stress-related brain regions, and consequently, it may act as a preventive measure against mental strain and potentially disease. Given rapidly increasing urbanization, the present results may influence urban planning to create more accessible green areas and to adapt urban environments in a way that will be beneficial for citizens' mental health.

Molecular Psychiatry; https://doi.org/10.1038/s41380-022-01720-6


THANK
YOU

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Omega-3 Fatty Acids - Consumer (nih.gov)

Omega-3 Fatty Acids - Consumer (nih.gov)

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