

The Standard American Diet & Diabetes: Are we inducing dementia in Indian Country?

Indian Country Dementia ECHO: For Health Care Providers

Director

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Presentation by:

J. Neil Henderson, PhD

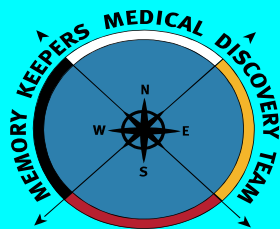
(Oklahoma Choctaw)

Professor Emeritus

Memory Keepers Medical Discovery Team

Department of Family Medicine and Biobehavioral Health

University of Minnesota Medical School, Duluth campus



Unprecedented Mass Human Longevity

*Never before have so many
people lived for so long.*



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Unprecedented Human Dementia Prevalence

*Never before have so many
people had so much dementia.*



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National Alzheimer's Project Act (NAPA)

<https://aspe.hhs.gov/collaborations-committees-advisory-groups/napa/napa-advisory-council/napa-advisory-council-meetings/napa-past-meetings/napa-2021-meeting-material/january-2021-meeting-presentation-risk-reduction-goal>

The National Alzheimer's Project Act (NAPA) Advisory Council is charged with working to create and advance a National Plan to address Alzheimer's disease and related dementias (ADRD). Since the inception of the National Plan with its aspirational goal to “to prevent and effectively treat Alzheimer's Disease by 2025,” research progress has dramatically improved our understanding of ADRD. (emphasis NOT in original)

NEW 6TH GOAL: Reduce the Burden of Risk Factors for Alzheimer's and Related Dementias

>>Risk Reduction<<

<https://aspe.hhs.gov/collaborations-committees-advisory-groups/napa/napa-advisory-council/napa-advisory-council-meetings/napa-past-meetings/napa-2021-meeting-material/january-2021-meeting-presentation-risk-reduction-goal>

To achieve the goal, aggressively address the following potential risk factors:

- Alcohol Abuse
- Depression
- Diabetes
- Hearing Loss
- Mid-Life Hypertension
- Physical Inactivity
- Poor Diet Quality and Obesity
- Poor Sleep Quality
- Tobacco Use
- Traumatic Brain Injury

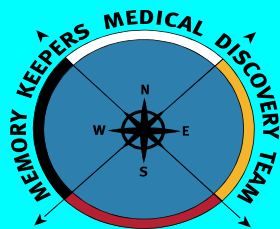


Is Dementia an...

***Induced* Disease??**

Wrong question.

***How much and what type(s) of dementia
are we inducing?***



What if we stopped inducing dementia?

Coley, Nicola, et al. (2019) *Alzheimer's & Dementia*

<https://www.elsevier.com/open-access/userlicense/1.0/>

By 2050:

9,000,000 Cases

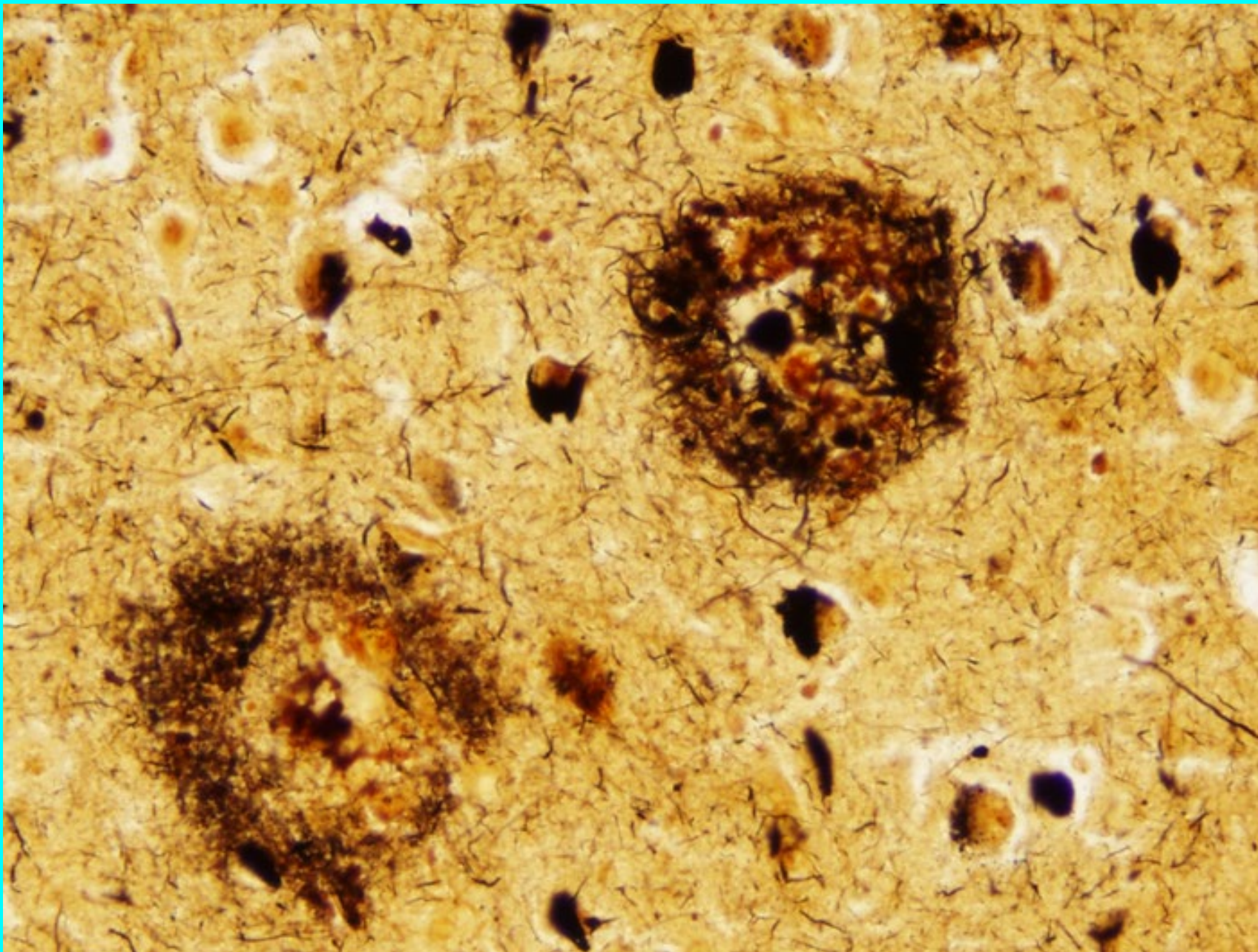
Would never have happened.

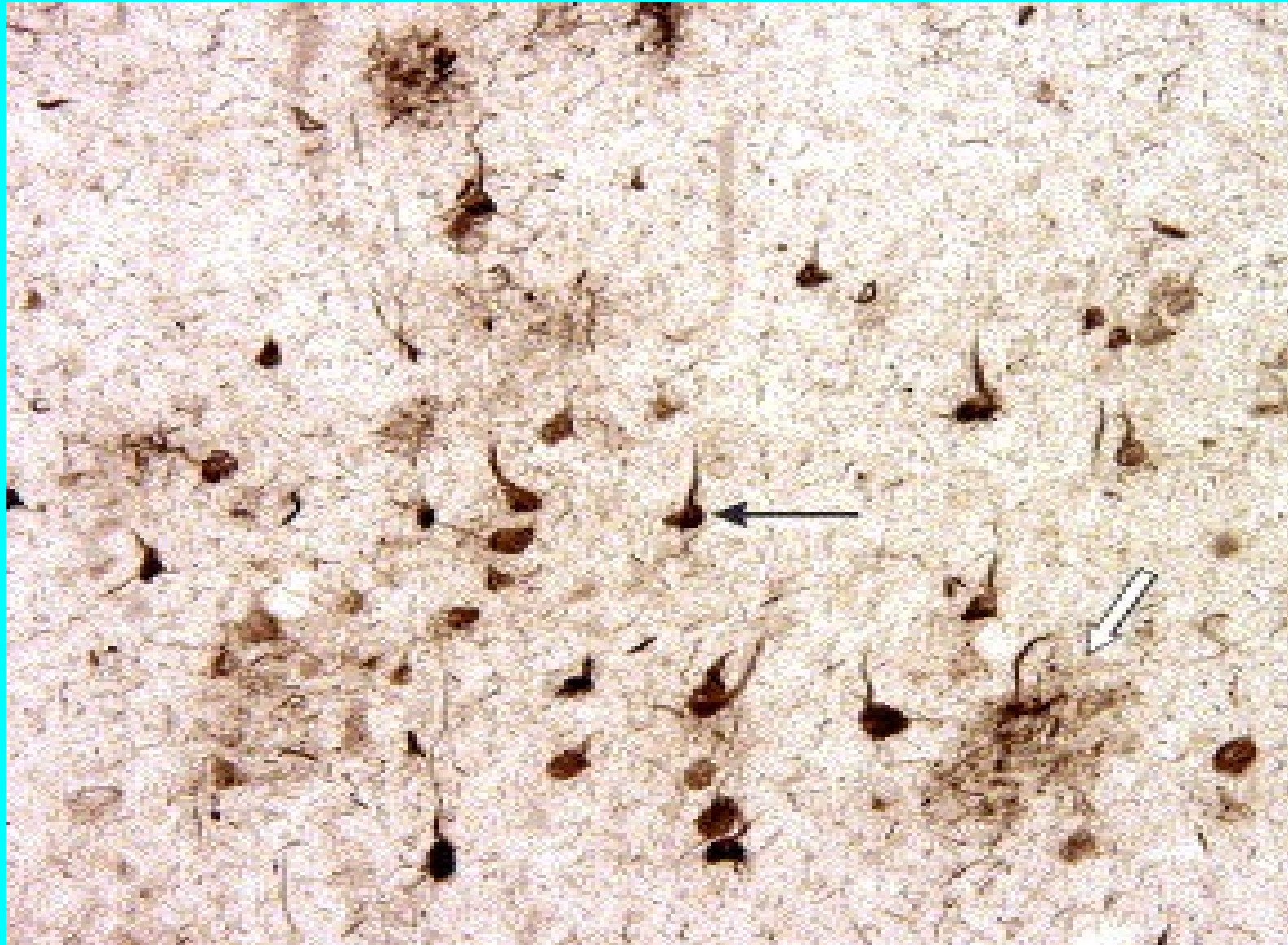
Cautionary note re: immediate use of risk reduction practices

Daly, Mastroleo, Gorski, and Epelbaum 2020
Theoretical Medicine and Bioethics

Exercise caution about:

- 1. Application of new non-validated practice to individual patients (clinical ethics)**
- 2. Communication of new non-validated practices via the scientific and lay press (scientific communication ethics)**
- 3. Making new non-validated interventions widely available before more definitive testing (public health ethics)**





Let's look at dementia in a new way...





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American Cultural Values and Selling Food

- **Hyper-individualism (Bloomberg's sugar ban)**
- **Meritocracy: valued people>wild salmon; devalued people>mac & cheese**
- **Business in all things: all food is just a product for sale**
- **Excessiveness in all things**
 - **Bigger is better: Supersize me**
 - **More is better: Get another pizza for free**
 - **It's never enough: Free refills**
 - **Culturally-based food ingestion patterns:**
 - **3 meals a day**
 - **Forgot: + brunch and linner**
 - **Forgot: anti-"hangry" pills any time of day (Snickers)**
 - **Forgot: late night bedtime snack**
 - **Next morning—repeat**

Alzheimer's Disease & Heterogeneous Causation

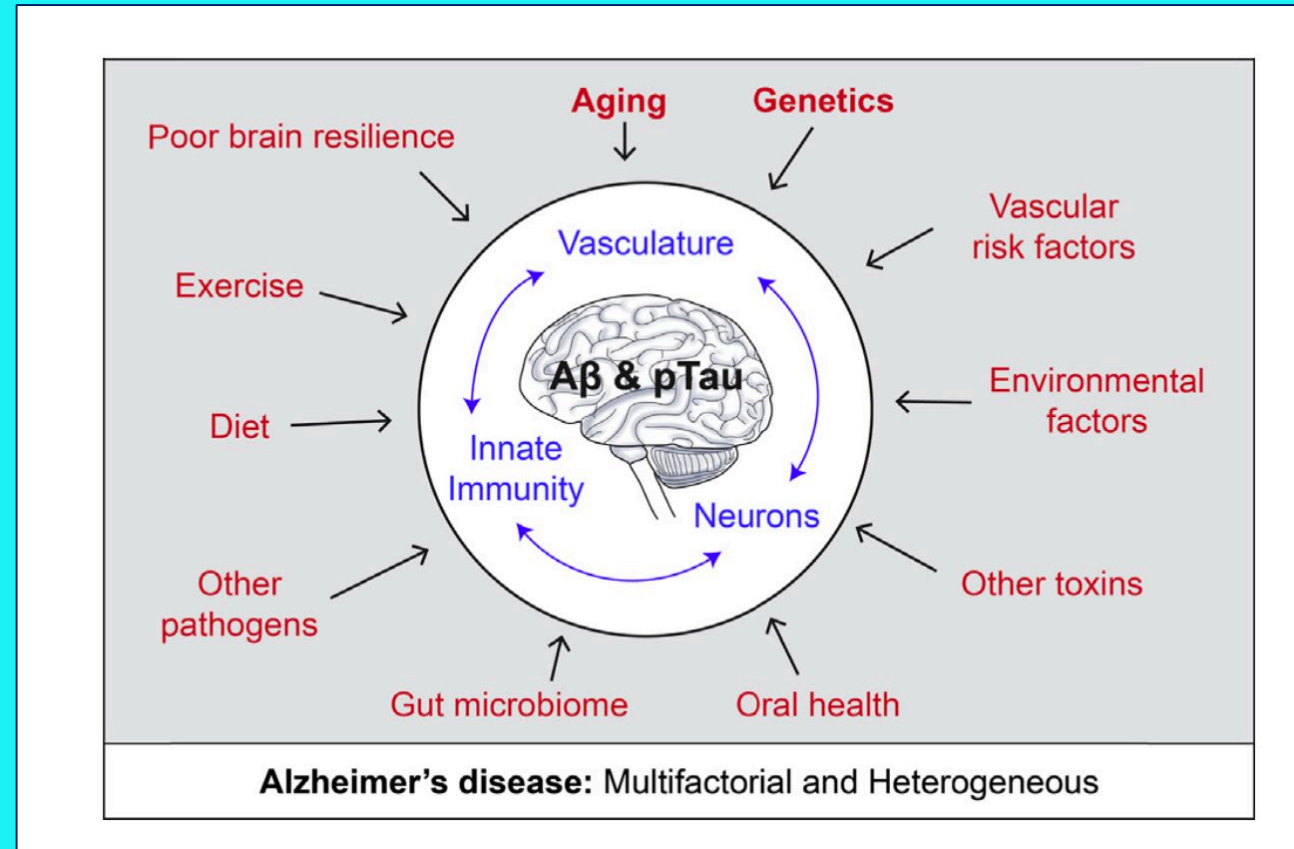
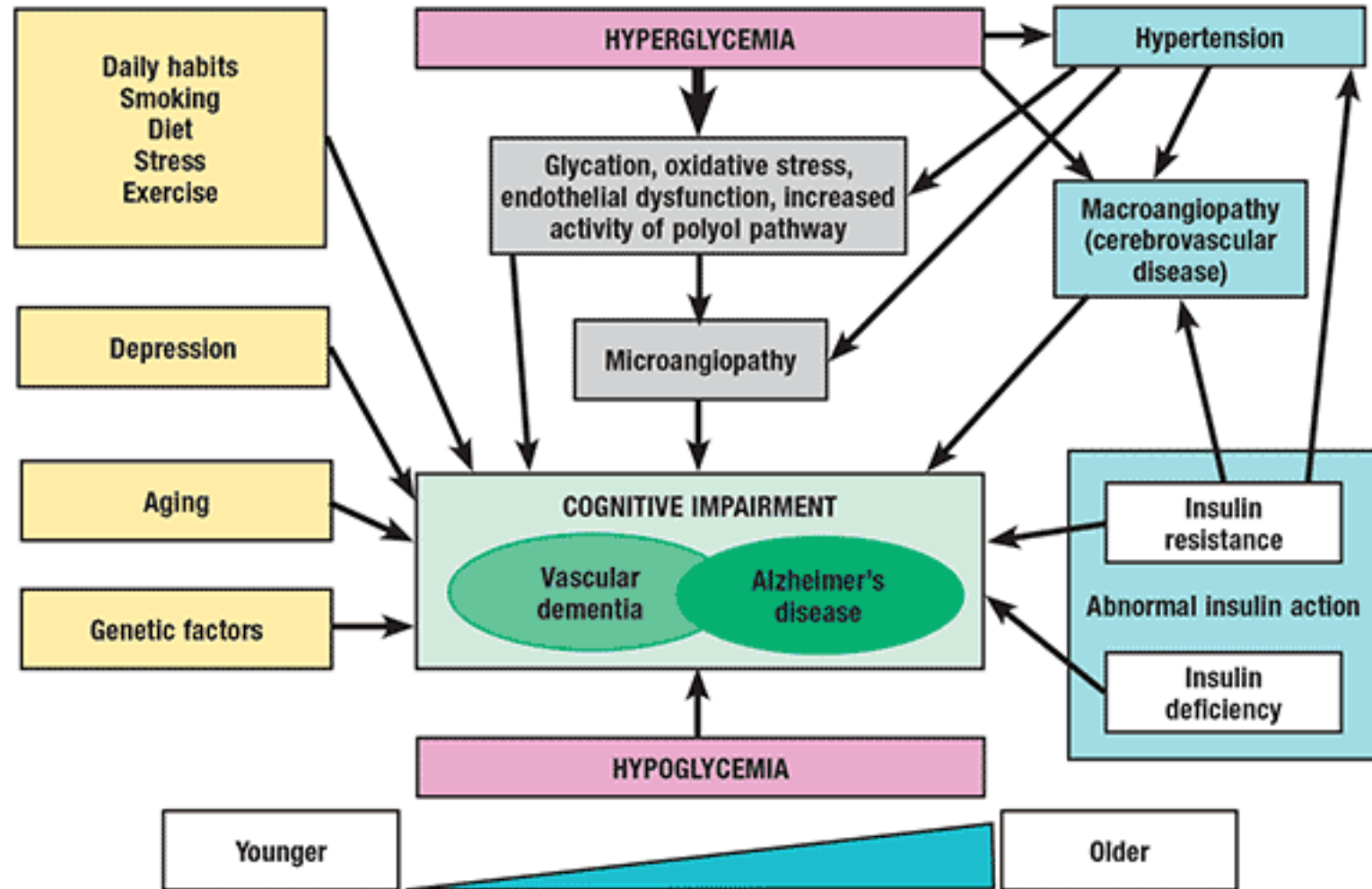
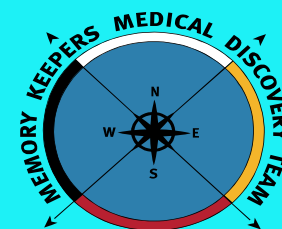


Figure 1. Possible Mechanistic Contribution to Cognitive Impairment Seen in Diabetes Mellitus



Source: Reference 12.



48.4% of AD Cases: Induced by 7 Factors

World Alzheimer Report

Ashby-Mitchell, et al. 2017 *Alzheimer's Research and Therapy*

1. Smoking
2. Midlife obesity
3. Physical inactivity
4. Low Educational attainment
5. Diabetes mellitus
6. Hypertension
7. Major depression



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Dementia prevention, intervention, and care: 2020 report of the Lancet Commission
Livingston, G., et al.
Lancet 2020

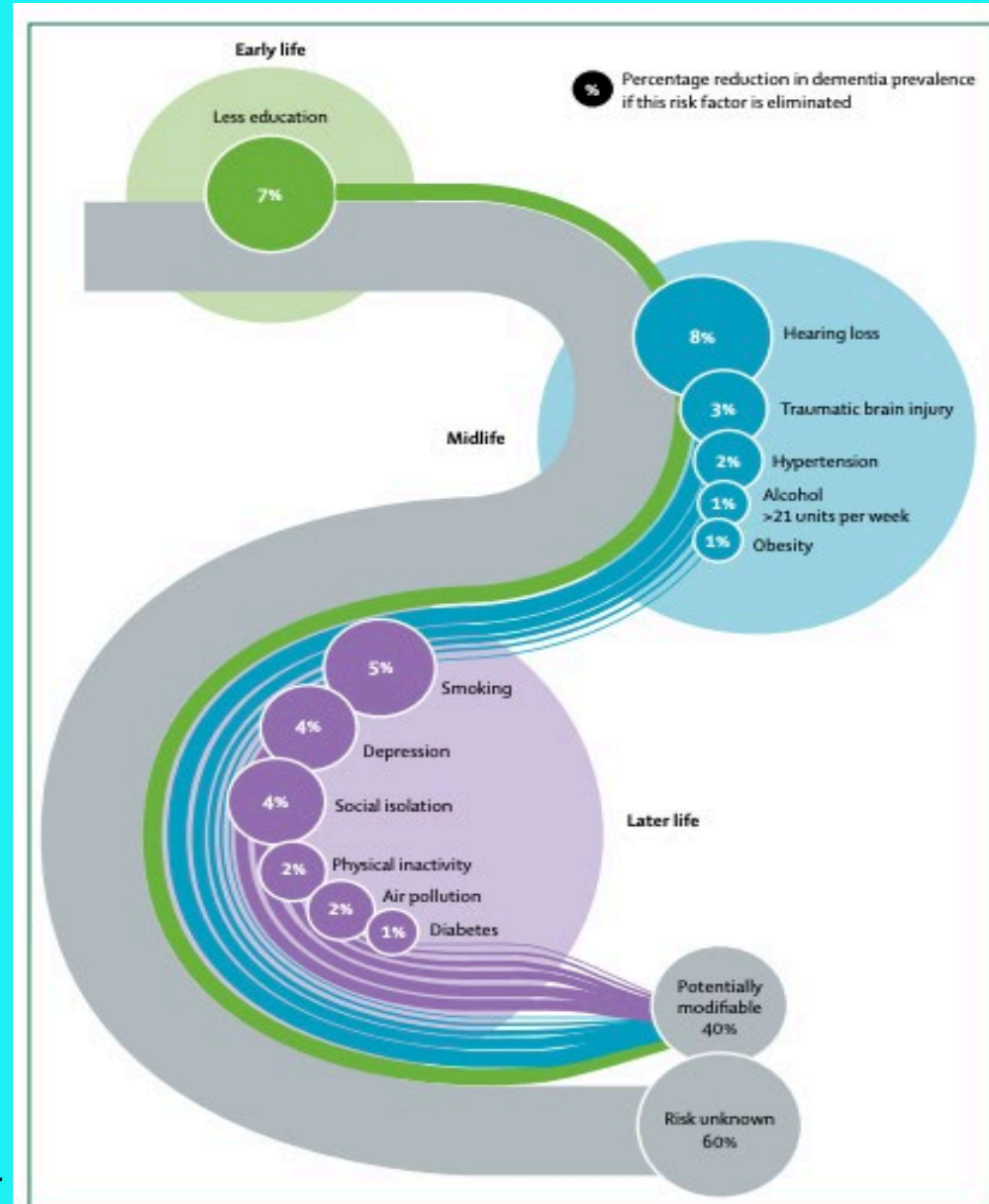
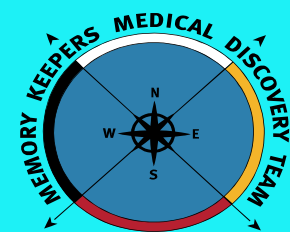


Figure 7: Population attributable fraction of potentially modifiable risk factors for dementia

M.D. Sweeney et al.



Evidence for Reducing Dementia by Interventions

Risk reduction of cognitive decline and dementia: WHO guidelines. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO.

RISK REDUCTION OF COGNITIVE DECLINE AND DEMENTIA

WHO GUIDELINES

EVIDENCE PROFILES

- Physical activity interventions
- Tobacco cessation interventions
- Nutritional interventions
- Interventions for alcohol use disorder
- Cognitive interventions
- Social activity
- Weight management
- Management of hypertension
- Management of diabetes
- Management of dyslipidaemia
- Management of depression
- Management of hearing loss





Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability, or FINGER Study)

- 1. Two-year combination therapy**
- 2. simultaneously targeting physical exercise,**
- 3. a healthy diet,**
- 4. cognitive stimulation,**
- 5. and self-monitoring of heart health risk factors**

FINGER study showed a protective effect on cognitive function.

Rosenberg A, Ngandu T, Rusanen M, Antikainen R, Backman L, Havulinna S, et al. Multidomain lifestyle intervention benefits a large elderly population at risk for cognitive decline and dementia regardless of baseline characteristics: The FINGER trial. *Alzheimers Dement* 2018;14:263-270.

FINGER Multifactorial Causation/Prevention Model

Kivipelto, M. *et al. Alzheimer's & Dementia* (2013)

Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability

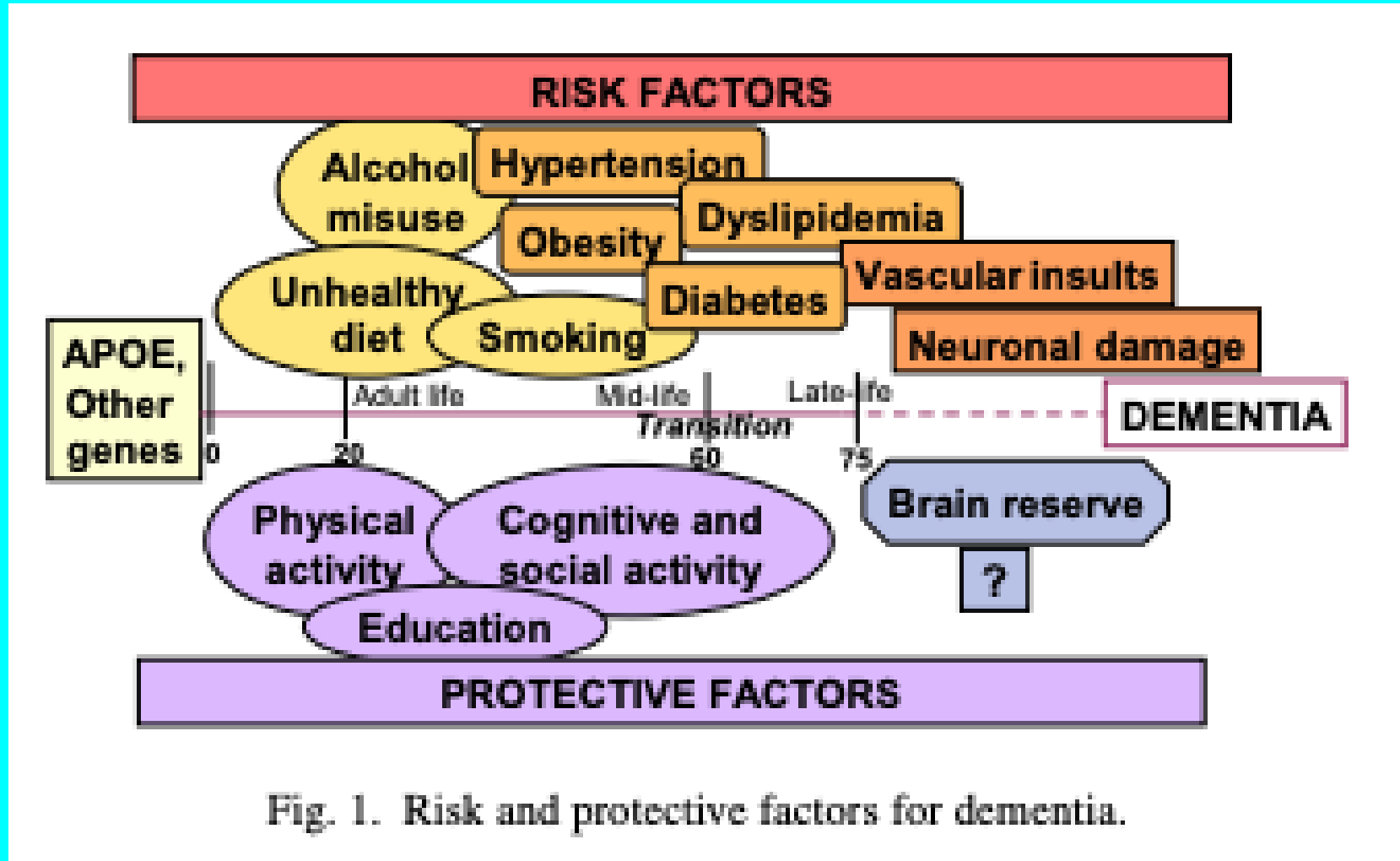


Fig. 1. Risk and protective factors for dementia.

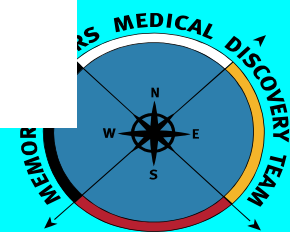


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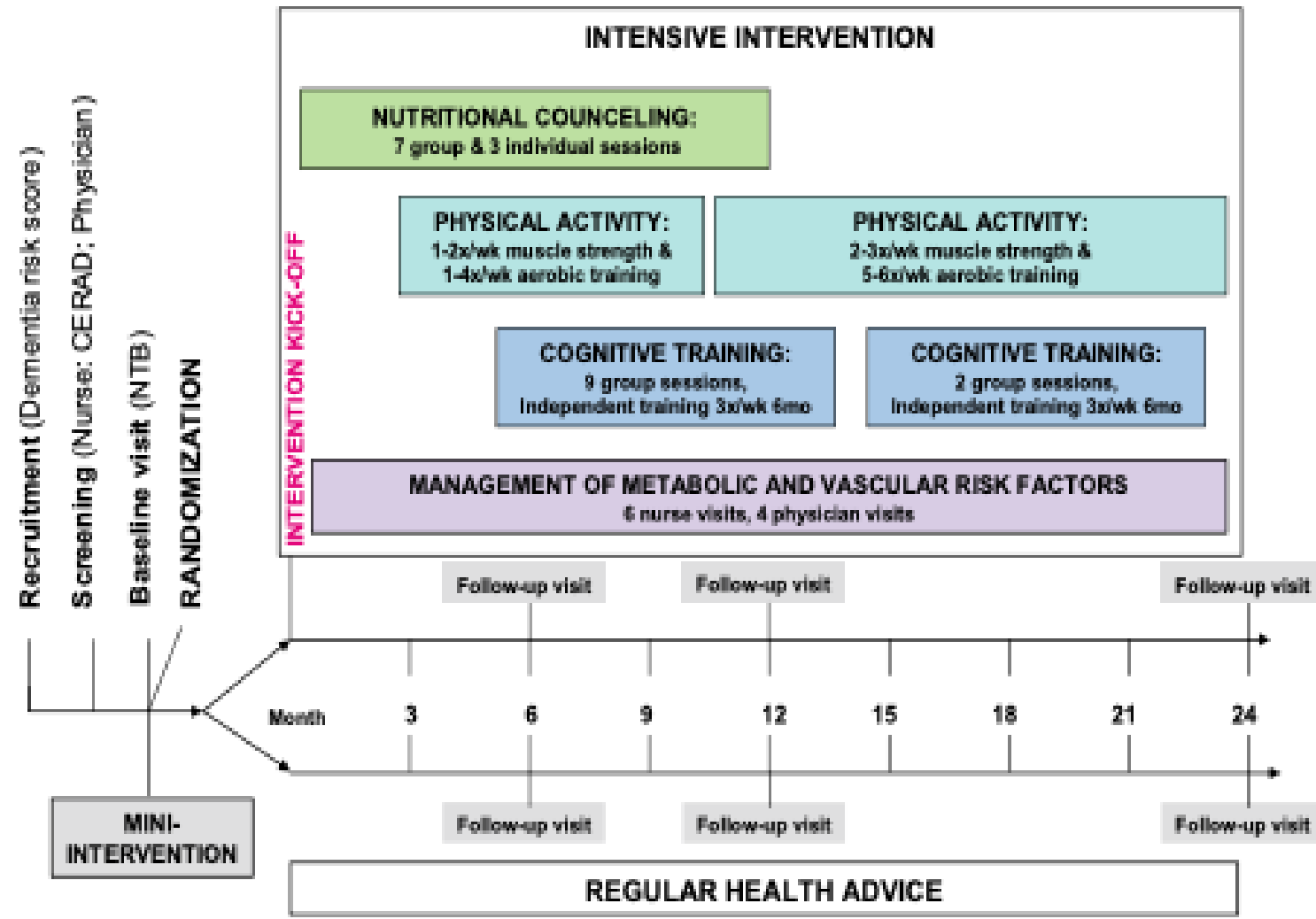
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FINGER Protocol

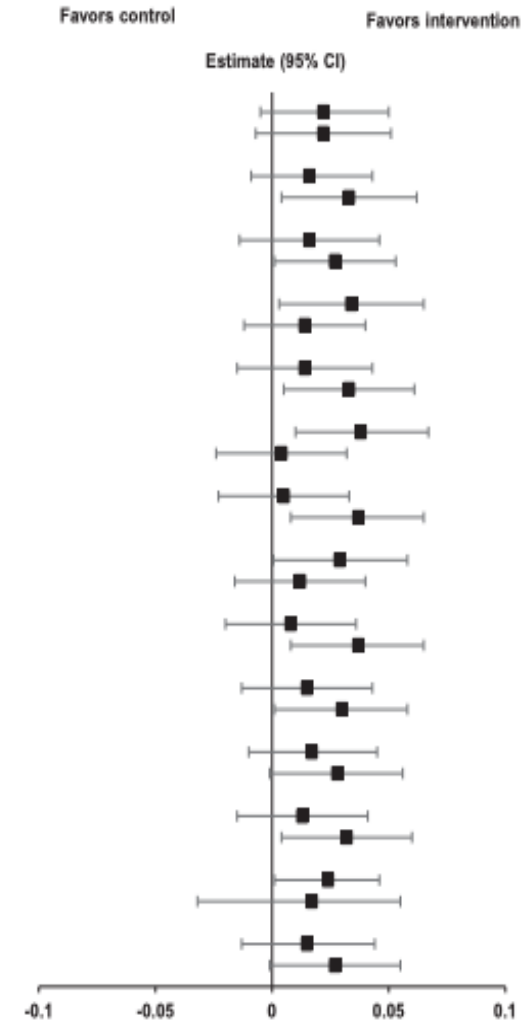
Kivipelto, M. *et al. Alzheimer's & Dementia* (2013)



FINGER Multifactorial Causation/Prevention Model

Rosenberg, A. et al. *Alzheimer's & Dementia* (2018)

Baseline characteristics (N Intervention/ N Control)		Estimate for difference between intervention and control groups per year (95% CI)	P-value for interaction*
Sex	Men (324/315)	0.022 (-0.005 – 0.050)	0.98
	Women (267/284)	0.022 (-0.007 – 0.051)	
Age, years	< 70 (314/336)	0.016 (-0.009 – 0.043)	0.86
	≥ 70 (277/263)	0.033 (0.004 – 0.062)	
Education, years	< 9 (253/263)	0.016 (-0.014 – 0.046)	0.73
	≥ 9 (337/335)	0.027 (0.001 – 0.053)	
MMSE score	< 27 (260/244)	0.034 (0.003 – 0.065)	0.41
	≥ 27 (329/354)	0.014 (-0.012 – 0.040)	
Annual household income, €	< 30 000 (274/278)	0.014 (-0.015 – 0.043)	0.35
	≥ 30 000 (291/295)	0.033 (0.005 – 0.061)	
Body mass index, kg/m ²	< 27.4 (286/300)	0.038 (0.010 – 0.067)	0.28
	≥ 27.4 (301/292)	0.004 (-0.024 – 0.032)	
Systolic blood pressure, mmHg	< 140 (289/294)	0.005 (-0.023 – 0.033)	0.63
	≥ 140 (298/298)	0.037 (0.008 – 0.065)	
Diastolic blood pressure, mmHg	< 80 (277/296)	0.029 (0.0006 – 0.058)	0.48
	≥ 80 (310/296)	0.012 (-0.016 – 0.040)	
Serum total cholesterol, mmol/l	< 5.1 (303/296)	0.008 (-0.020 – 0.036)	0.25
	≥ 5.1 (288/299)	0.037 (0.008 – 0.065)	
LDL-C, mmol/l	< 3.04 (302/292)	0.015 (-0.013 – 0.043)	0.31
	≥ 3.04 (289/303)	0.030 (0.001 – 0.058)	
HDL-C, mmol/l	< 1.4 (304/300)	0.017 (-0.010 – 0.045)	0.33
	≥ 1.4 (287/295)	0.028 (-0.001 – 0.056)	
Fasting plasma glucose, mmol/l	< 5.9 (289/300)	0.013 (-0.015 – 0.041)	0.89
	≥ 5.9 (302/297)	0.032 (0.004 – 0.060)	
Presence of cardio- vascular comorbidity	No (469/468)	0.024 (0.001 – 0.046)	0.63
	Yes (118/126)	0.017 (-0.032 – 0.055)	
Overall cardiovascular risk	< 1.4 (282/285)	0.015 (-0.013 – 0.044)	0.60
	≥ 1.4 (299/298)	0.027 (-0.001 – 0.055)	

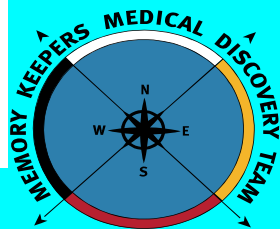


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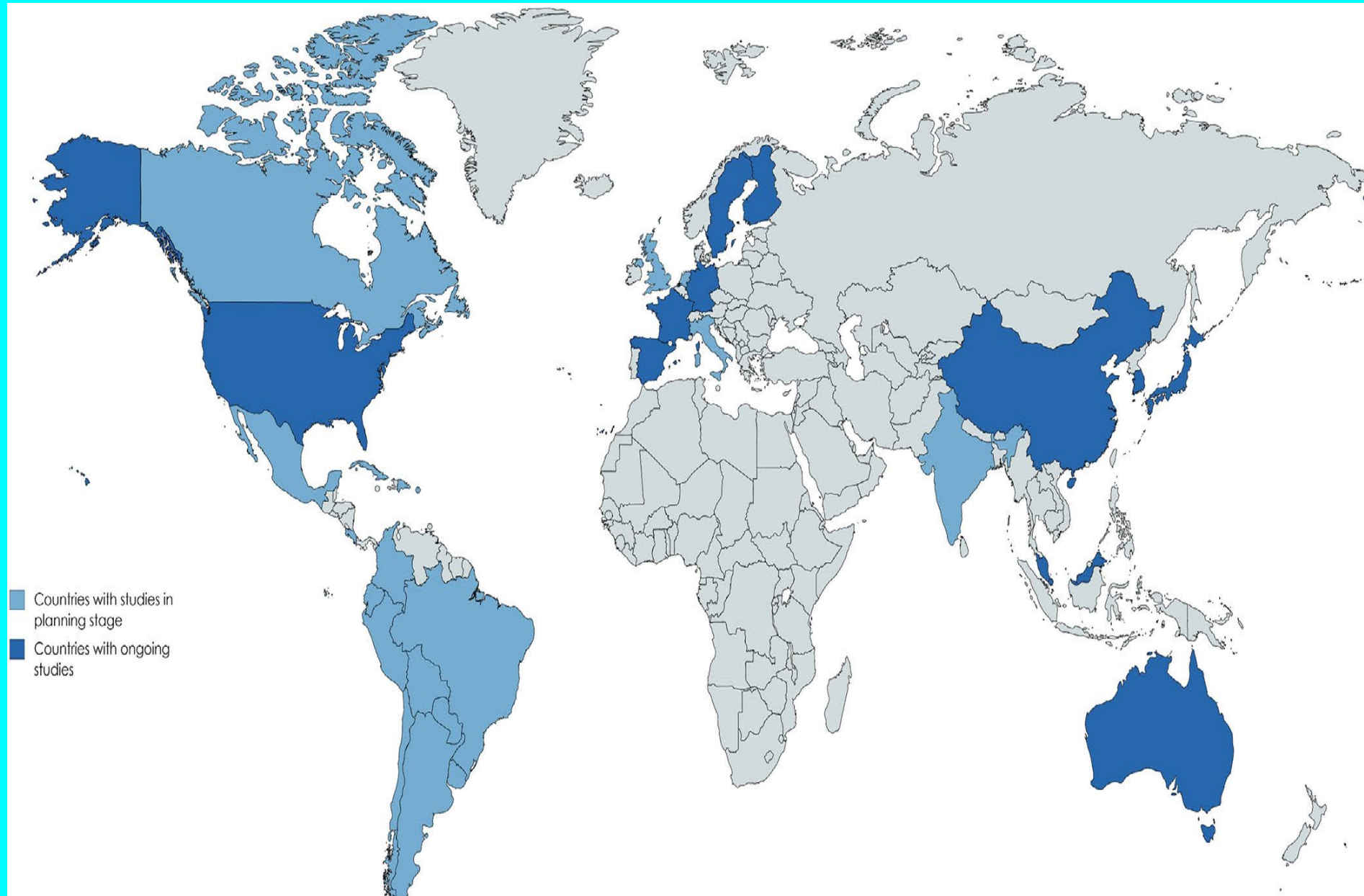
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W-W FINGER Multifactorial Causation/Prevention Model

Kivipelto, M. et al. *Alzheimer's & Dementia* (2020)



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Alzheimer's Association U.S. Study to Protect Brain Health Through Lifestyle Intervention to Reduce Risk (U.S. POINTER)

- Two-year clinical trial to evaluate whether lifestyle interventions that simultaneously target many risk factors protect cognitive function in older adults who are at increased risk for cognitive decline.
- U.S. POINTER is the first such study to be conducted in a large group of Americans across the United States.

Plus:

- Neuroimaging
- Sleep
- Microbiome
- NeuroVascular

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Alzheimer's Association US POINTER Lifestyle Intervention Study Research Centers

- 1. 2-year lifestyle intervention**
 - a. Physical exercise**
 - b. Healthy diet**
 - c. Cognitive Stimulation**
 - d. Self monitoring of heart health risk factors**



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Alzheimer's Association US Pointer Lifestyle Intervention Study

Inclusion criteria:

- **Ages 60-69**
- **Exercise <3 times/week**
- **Risk factors:**
 - **Family Hx**
 - **Slightly high blood pressure, cholesterol, or blood sugar**
 - **Live in the area of the study performance**

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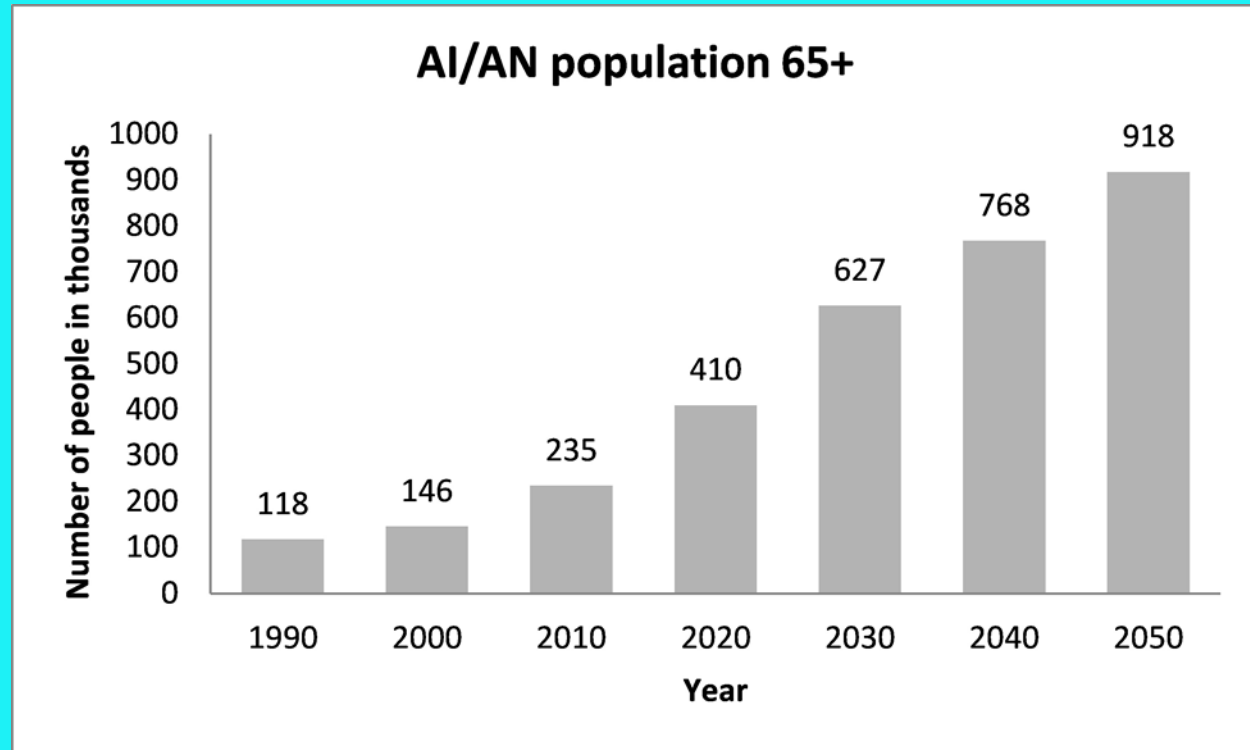
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AI/AN Population 1990-2050

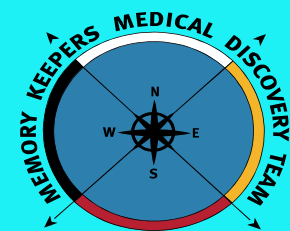


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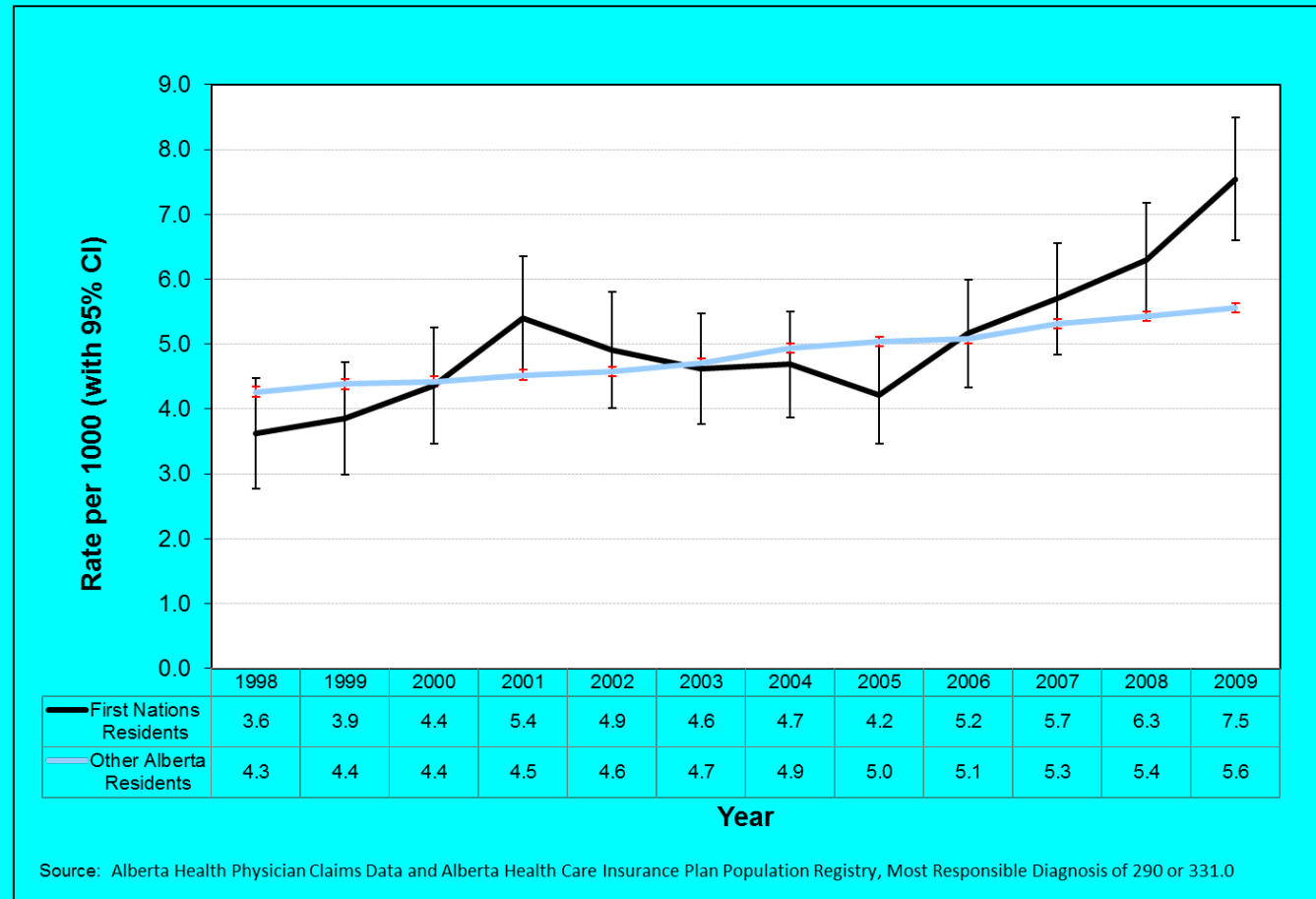
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Dementia in Indigenous Peoples in Canada

- Prevalence **34%** higher in First Nations
- Average age of onset **10 years** younger
- Greater proportion of males
- Dementia **increasing** at a faster rate in First Nations

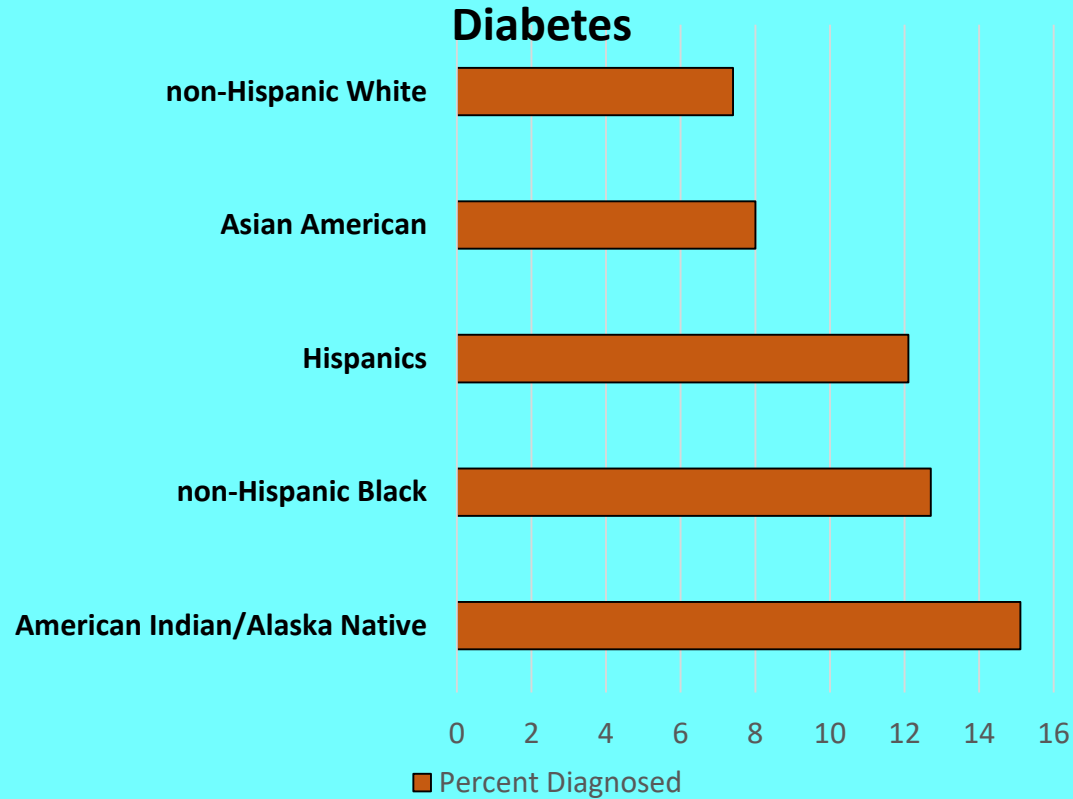


Age-adjusted treated prevalence of Alzheimer's disease and dementia, Alberta, 1998-2009

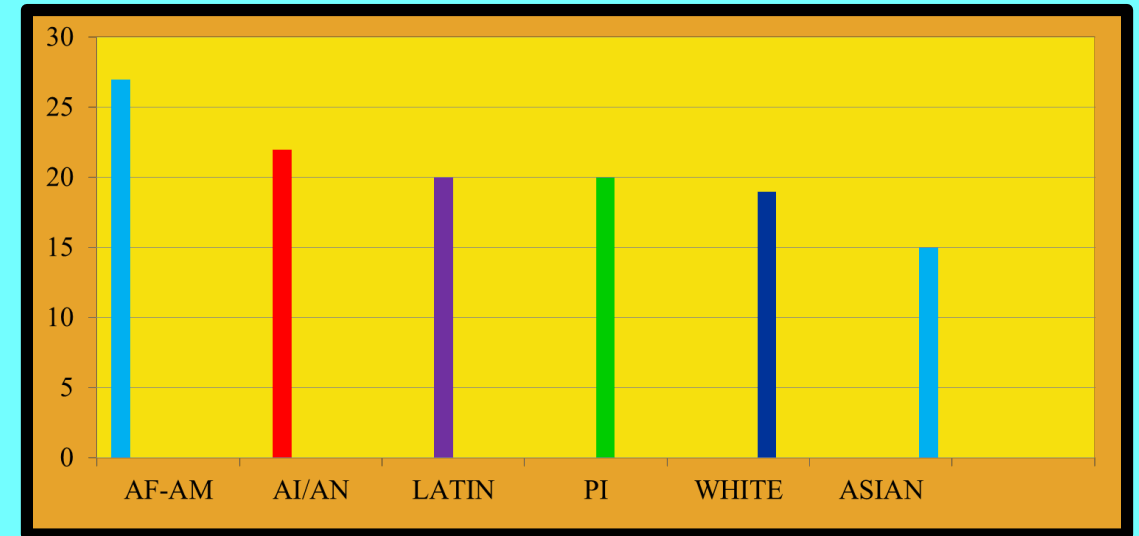
Jacklin K, Walker J & Shawande M (2013) Canadian Journal of Public Health

Diabetes

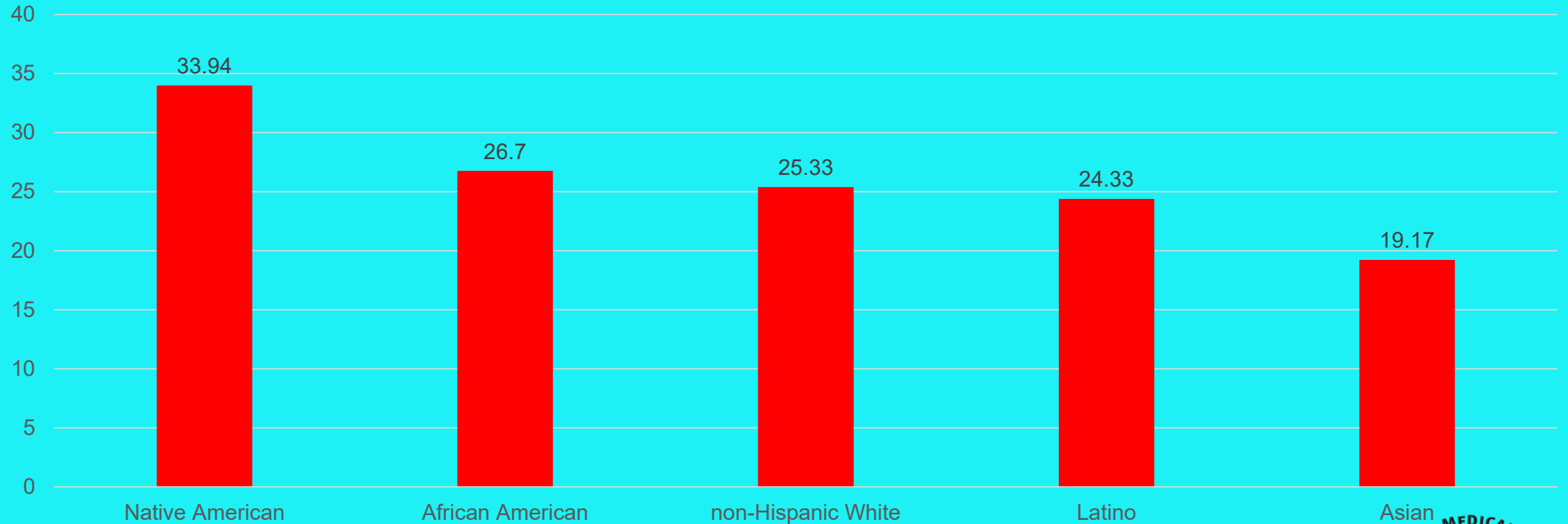
Percent of Adults Diagnosed With Diabetes



Dementia



10-Year Incidence of Dementia in Ethnic Groups with Type 2 Diabetes



Age-adjusted incidence density per 1000 person-years (Mayeda et al 2014)

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Global Growth of Type 2 Diabetes

- 2000 151million with T2 diabetes
- 2010 285 million
- 2014 422 million
- 2019 463 million
- 2030 568 million



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Organization For Economic Cooperation And Development

- **Of the 37 member countries, Americans rank:**
- **#1 diabetes,**
- **#2 Alzheimer's disease**
- **#5 cancer**
- **#6 cardiovascular disease.**



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75% of below is preventable and *is caused by sugar overconsumption.*

- 1. Type 2 diabetes,**
- 2. Cardiovascular disease,**
- 3. Fatty liver disease,**
- 4. Chronic renal failure**
- 5. Collectively account for 75% of all healthcare costs which is a total of \$3.5 trillion.**



What is the best diet?

I don't know.

All the research agrees that eating whole unprocessed food is best.

So,

No processed food.

No seed oils.

No sugar.

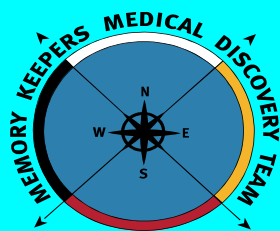


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MIND Food Plan

- ***Mediterranean-DASH Intervention for Neurodegenerative Delay***
- ***Dietary Approaches to Stop Hypertension***
- **Analysis showed that, after an average of 4.5 years, people who adhered most closely to the MIND diet had a 53% reduced rate of Alzheimer's disease vs those who did not follow the diet closely.**

Morris, M. C., et al. MIND diet associated with reduced incidence of Alzheimer's disease. *Alzheimer's & Dementia*, Vol 11, Issue 9, 2015.



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MIND Food Plan: Mediterranean Intervention for Neurodegenerative Delay

Include These	Limit These
<ul style="list-style-type: none">• Green leafy vegetables: every day• Other vegetables: at least once per day• Nuts: every day• Berries: at least twice per week• Beans: every other day• Whole grains: three times per day• Fish: at least once per week• Poultry: at least twice per week• Olive oil• Wine: one glass per day	<ul style="list-style-type: none">• Red meats• Butter and stick margarine: less than 1 tablespoon per day• Cheese: less than one serving per week• Pastries and sweets: limit• Fried or fast food: less than one serving per week

 Thalheimer, Judith C. Food for Thought: The MIND Diet — Fighting Dementia With Food. *Today's Dietitian*, Vol. 17 No. 9 P. 28 September 2015.

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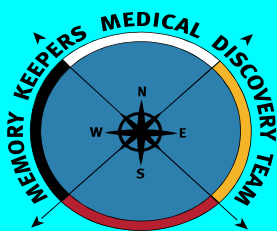
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Things we ate in the past



The Three Sisters have not died. They are still out there for us!



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Things we ate in the past



Real Food: closest to the sun, earth, and water.

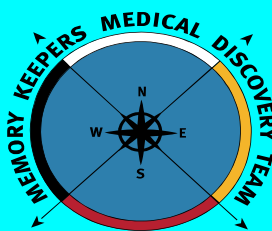


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Things we ate in the past



Arapaho: buffalo meat drying.

Ojibwe: wild rice

Public Health Action

- A problem must be virtually everywhere, such as sugar.
- A problem must be toxic, meaning that it damages the body.
- There must be abuse/addiction as found in tobacco, alcohol, and sugar.
- The problem affects others beyond a single individual.



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But can we really change Big Food?

- **Four major tectonic cultural shifts in the last forty years:**
 1. **Smoking in public places.**
 2. **Drunk driving.**
 3. **Bicycle helmets & seat belts**
 4. **Condoms in bathrooms**
 5. **American with Disabilities Act**

Lustig, R. (2021) *Metabohcal: The lure and the lies of processed food, nutrition, and modern medicine*. NY: Harper.

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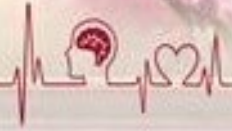
Healthy Heart, Healthy Brain...

The River of Life Flows Through the Heart,
Protecting the Mind and Body

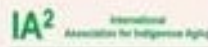


1 in 3

American Indians over 65 develop dementia, including Alzheimer's



Make an appointment with your doctor today to talk about how to keep your mind and heart healthy.



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Healthy Heart, Healthy Brain...

The River of Life Flows
Through the Heart,
Protecting the Mind and Body



5.7 Million

Americans have Alzheimer's disease



1 in 10

People age 65 and older has Alzheimer's



1 in 3

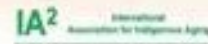
American Indians over 65 develops dementia, including Alzheimer's



Elders with heart disease, high blood pressure, or diabetes have a much higher risk of developing Alzheimer's or other dementias.

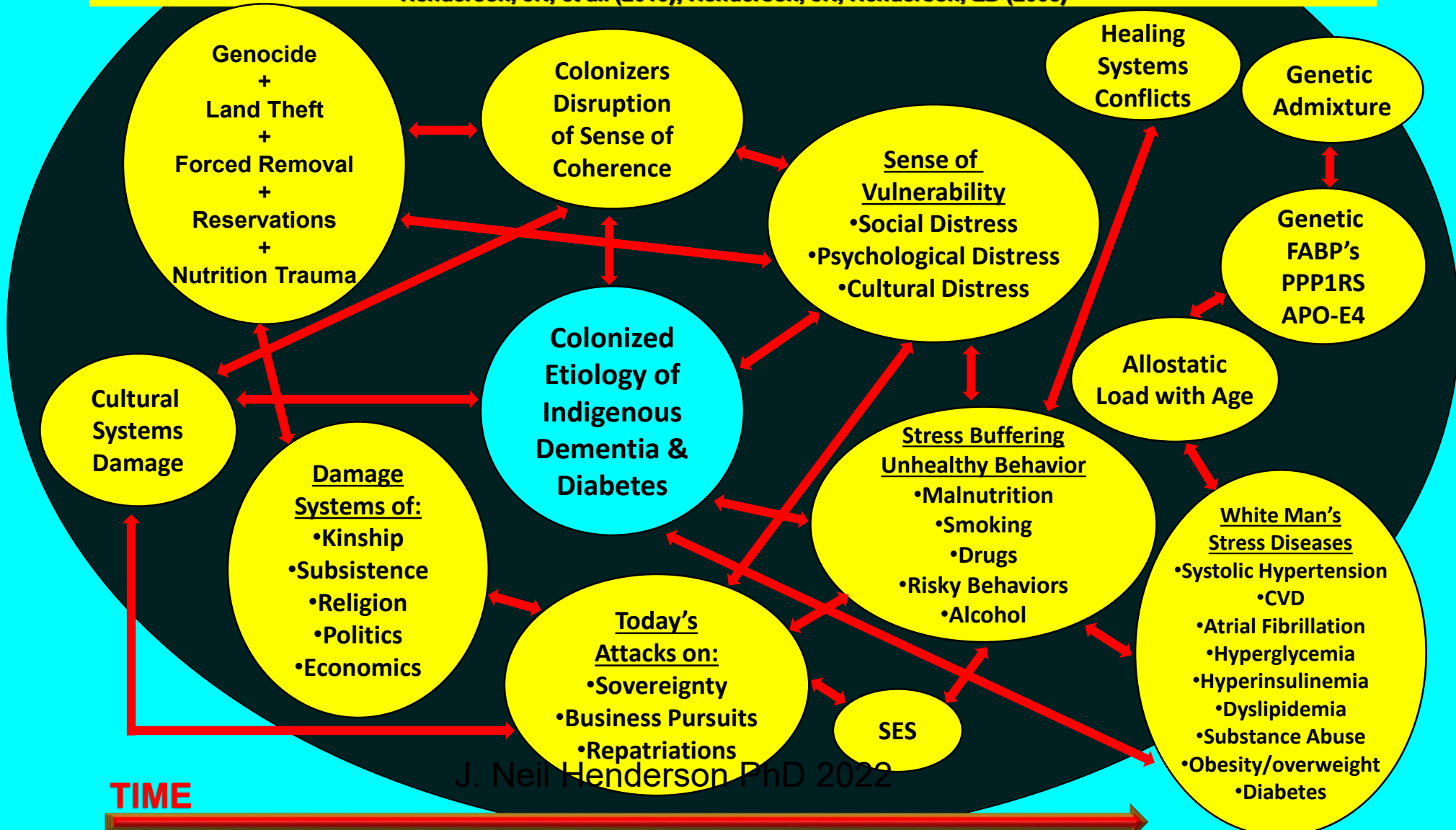


Make an appointment with your doctor today to talk about how to keep your mind and heart healthy.



The Dementia-Diabetes Syndemic: The Embodiment of Oppression

Henderson, JN, et al. (2019); Henderson, JN, Henderson, LD (2005)



Real Food Resources

- ***Metabolical.* Robert Lustig, MD 2021**
- ***We are What We Eat.* Alice Waters, 2021**
- ***Animal, Vegetable, Junk.* Mark Bittman 2021**
- ***Hooked: Food, Free Will, and How the Food Giants Exploit Our Addictions.* Michael Moss 2021**
- ***The Problem of Alzheimer's Disease.* Jason Karlawish 2021**
- ***Stuffed: An Insider's Look at Who's (Really) Making America Fat and How the Food Industry Can Fix It.* Hank Cardello 2009**