



Optimizing Brain Health: Lifestyle, Aging and Disease Risk Reduction

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Disclosures

Neither I nor my partner has a relevant financial relationship with a commercial interest to disclose.

Brain Health: Transdiagnostic / Transdiscipline (Neurology, Psychiatry, Physiatriy, and more)



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“Brain health is the state of brain functioning across cognitive, sensory, social-emotional, behavioral and motor domains, allowing a person to realize their full potential over the life course, irrespective of the presence or absence of disorders. Continuous interactions between different determinants and a person’s individual context lead to lifelong adaptation of brain structure and functioning. **Optimizing brain health improves mental and physical health and also creates positive social and economic impacts, all of which contribute to greater well-being and help advance society.”**

-”Optimizing brain health across the life course: WHO Position Paper” (2022)

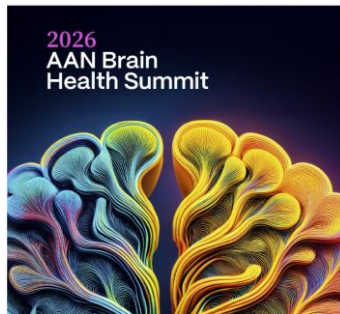
Starts with individual brain health → benefits of optimizing brain health to community/society

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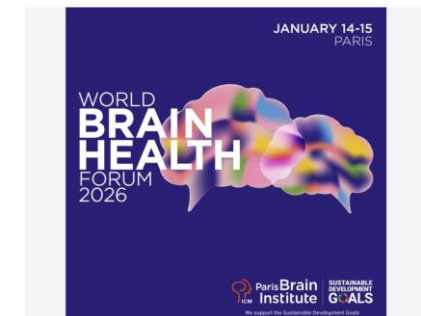
“Brain health is a continuous state of attaining and maintaining the optimal neurologic function that best supports one's physical, mental, and social well-being through every stage of life.” -American Academy of Neurology (AAN), AAN Brain Health Platform and Position Statement (2023)

Focus on individual brain health across the life span (n=1) but also on communities, societies



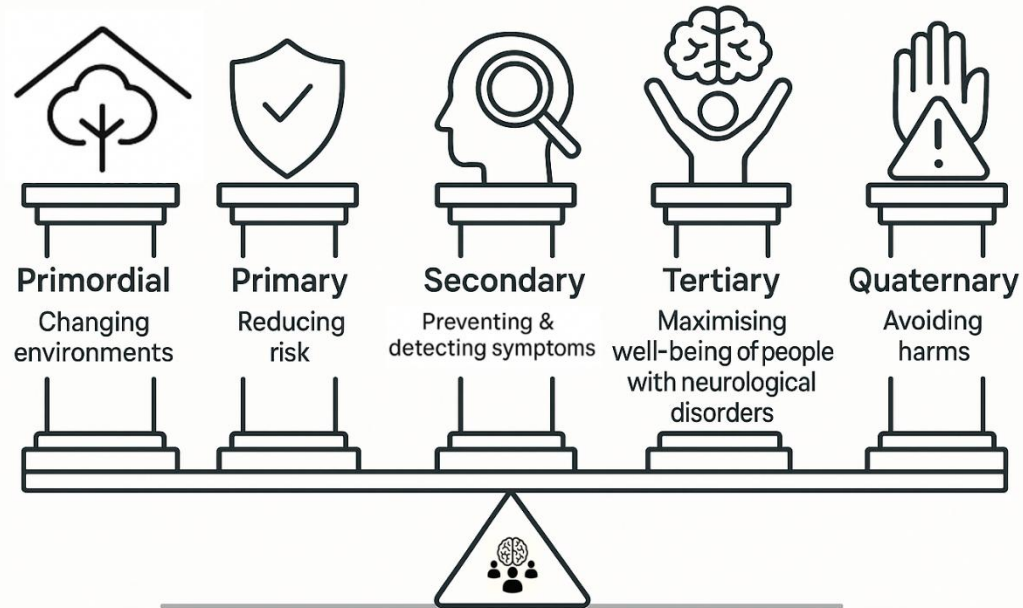
Brain Health Across the Life Span: A Framework for Future Studies: A Scientific Statement From the American Heart Association

Elisabeth Breese Marsh, MD, FAHA, Chair, Helen Lavretsky, MD, MS, Vice Chair, Nadine A. Kasparian, PhD, Nancy A. Pike, PhD, RN, FAHA, Kristian P. Doyle, PhD, Neelum T. Aggarwal, MD, Heather J. Fullerton, MD, MAS, ... [SHOW ALL](#) ... Council on Clinical Cardiology | [AUTHOR INFO](#)
[AFFILIATIONS](#)
Stroke • Volume 57, Number 6



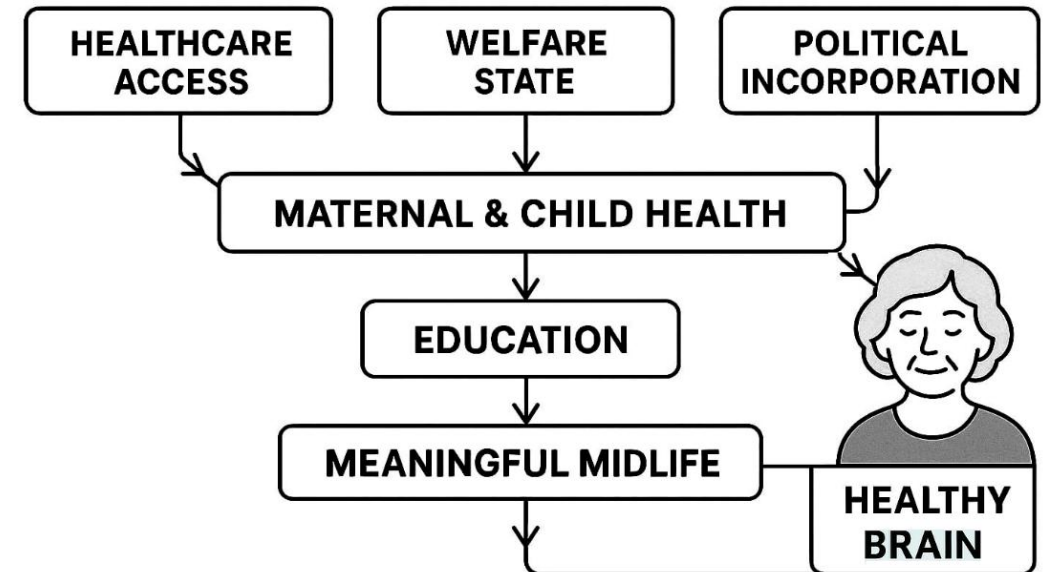
“Public Brain Health”

We define public brain health as the intersectoral action to establish brain health priorities, empower communities, and reduce health inequities with the ultimate goal of improving lifelong brain health at the population level.



FIVE KINDS OF PREVENTION IN PUBLIC BRAIN HEALTH

THE LIFE-COURSE APPROACH TO BRAIN HEALTH



Facts about Alzheimer Disease and Related Dementias

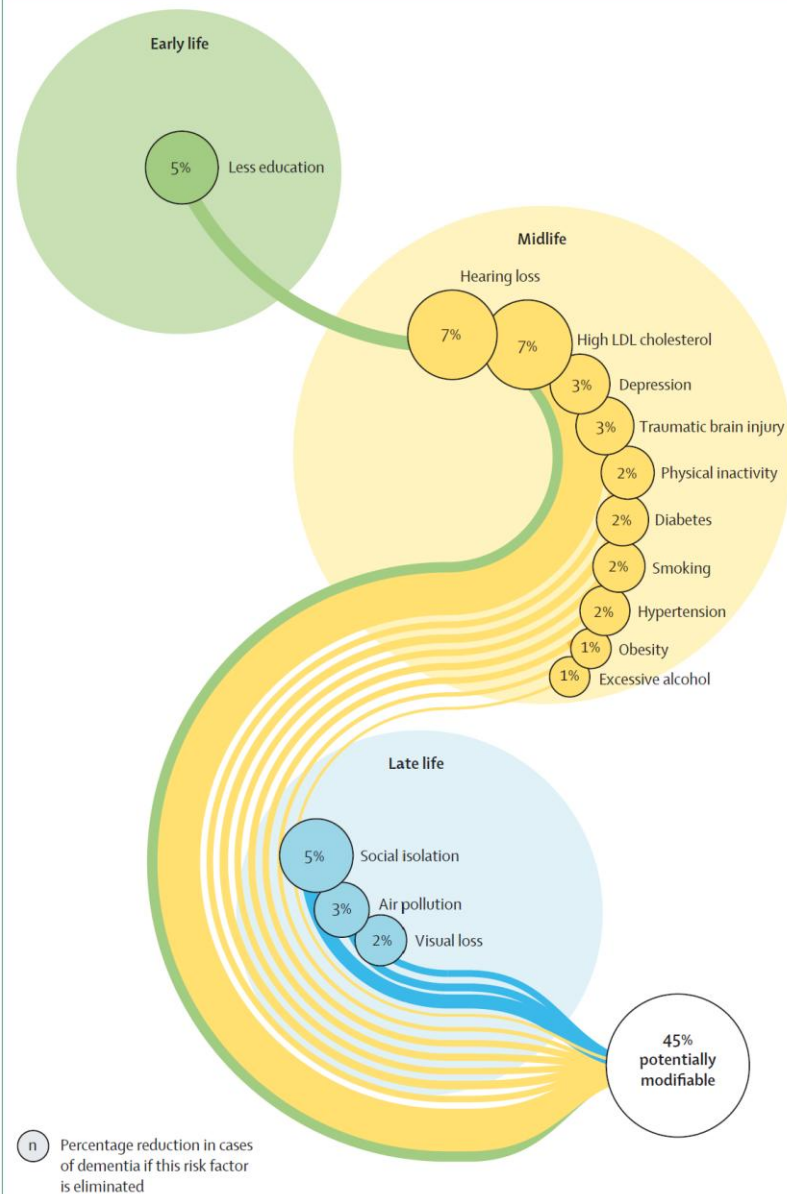


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- ~7.4 million people with Alzheimer disease and related dementias (ADRDs) in the U.S. and ~70 million globally (60% in LMIC) (2026)
- 15-20+% of adults 65 and older likely have a mild cognitive disorder (risk factor/prodromal stage prior to dementia)
- In the U.S., Black Americans have up to 2x higher risk of ADRDs than Whites; Hispanic Americans 1.5x higher
- Delaying the onset of dementia by 5 years could reduce the prevalence by 50%
- Total payments for all with ADRDs in the United States: ~\$409 billion (2026, est.); economic value of unpaid caregiver care \$446 billion (2026)



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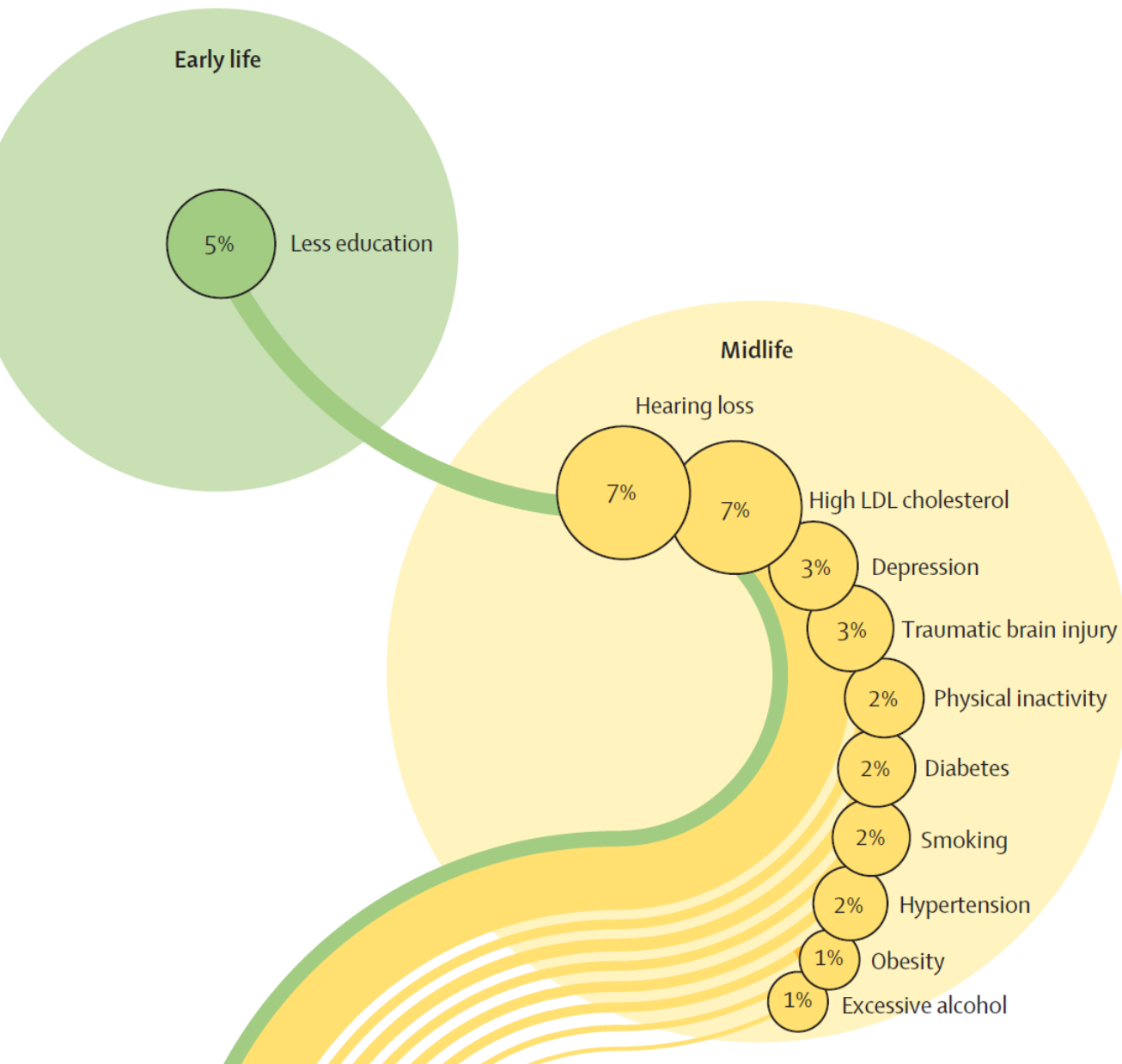
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Risk Factors for
Dementia



**~45% are
potentially
modifiable**

Lancet Commissions
Livingston, et al, 2024



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ⁿ Percentage reduction in cases of dementia if this risk factor is eliminated

Consensus Recommendations



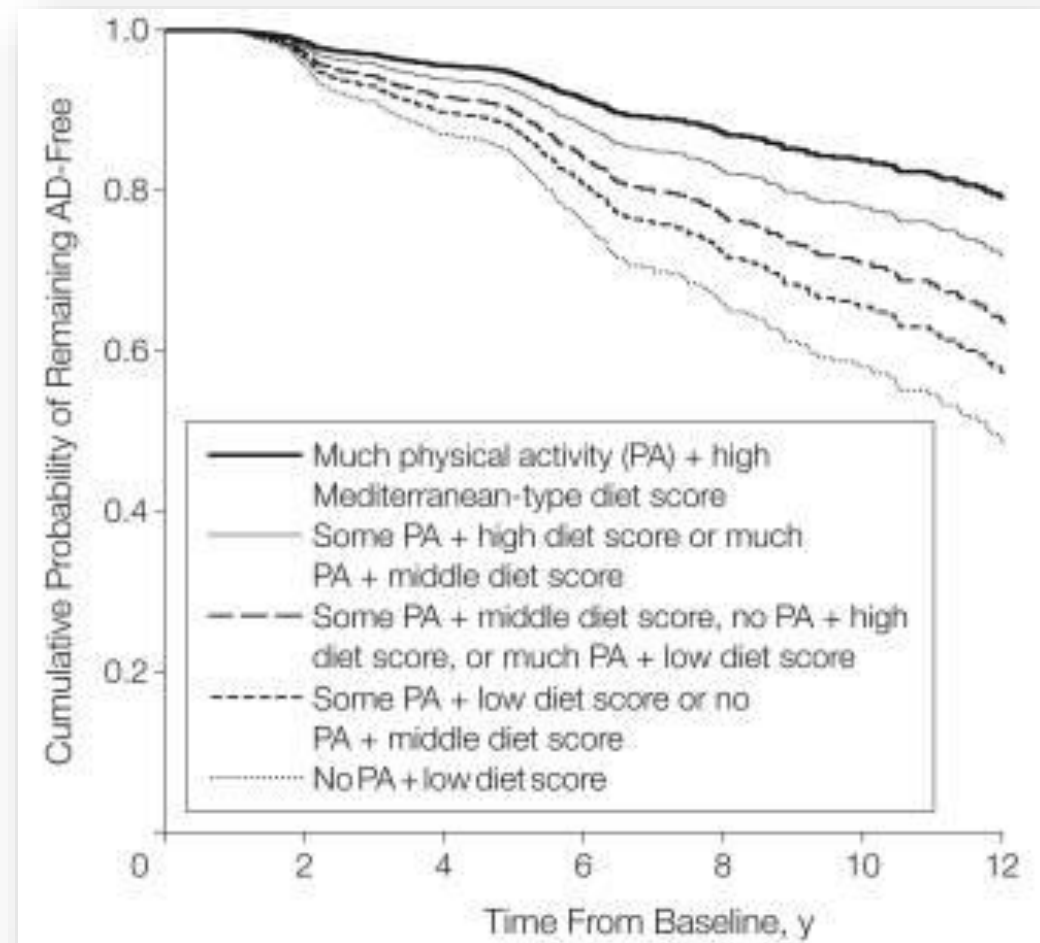
National Academies of Science
American Heart Association
Lancet Commissions
Alzheimer's Association
Institute of Medicine

Physical Activity	X	X	X	X	X
Cognitive Stimulation/Education	X	X	X		X
Social Engagement	X	X	X		
Heart Healthy Diet	X	X		X	
Treat cardiovascular risk factors (HTN)	X	X	X	X	X
Treat cardiovascular risk factors (DM)	X	X	X	X	
Treat cardiovascular risk factors (Hyperlipidemia)				X	
Maintain a healthy weight/counter metabolic syndrome		X	X	X	
Stop/reduce smoking	X		X	X	
Manage depression/stress		X	X		
Maintain adequate sleep	X	X			
Manage hearing and visual impairments			X		
Avoid OTC meds with anticholinergic properties	X				
Limit alcohol use	X				
Protect the brain from physical and toxic injuries	X	X			

Evidence for Multi-Lifestyle/Behavior Changes on Dementia Risk Reduction (2000s)

Two cohorts (total 1880) of cognitively healthy elders in NYC

Highest diet and physical activity scores had best chance of remaining dementia-free



Evidence for Hypertension Treatment in Risk Reduction of Cognitive Impairment (2019)



SPRINT MIND trial

- Multi-center RCT in cognitively normal older adults with hypertension and no stroke history (age 68); N=~9300
 - Intensive control: SBP <120 (n=4,278)
 - Standard control: SBP <140 (n=4,285)
 - Median intervention period: 3.3 years
 - Median f/u period: 5.1 years
- Primary Outcome: progression to dementia; HR 0.83 (95% CI, 0.67-1.04)
- Secondary Outcome: progression to MCI; HR 0.81 (95% CI, 0.69-0.95)

Although a small absolute effect, intensive BP control significantly reduced the risk of MCI and the combined rate of MCI or probable dementia

The Systematic Multi-Domain Alzheimer Risk Reduction Trial: SMAART) (2024)



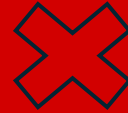
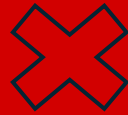
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Physical inactivity
Uncontrolled BP
Poor sleep
Prescription medication affecting cognition
High depressive symptoms
Uncontrolled diabetes
Social isolation
Current smoking



Single site, RCT of 172 older adults (age 70-89) without cog. impairment, from primary care clinics in Washington; Risk factors $\geq 2/8$ (2018-2022)

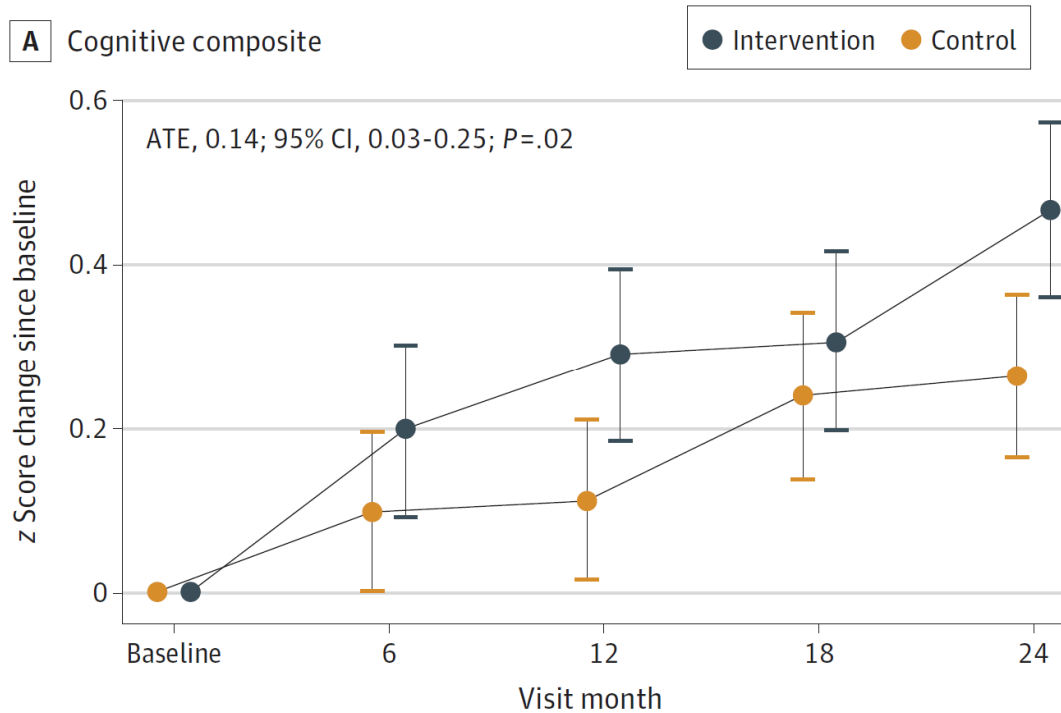
2-year intervention. Randomly assigned 1:1 to health coach arm vs. education control

- 1) 90: Coaching sessions (in-person vs. telephone-COVID) w/ social worker or psychologist, every 4 to 6 weeks (20-45 min.) for first 3 months; every 6 weeks for 15 months; set goals related to risk factors; for visual aids used with personalized goal, until goal was achieved
- 2) 82: Materials mailed (1-2 pages) every 3 months, from Alz. Association with risk factor education

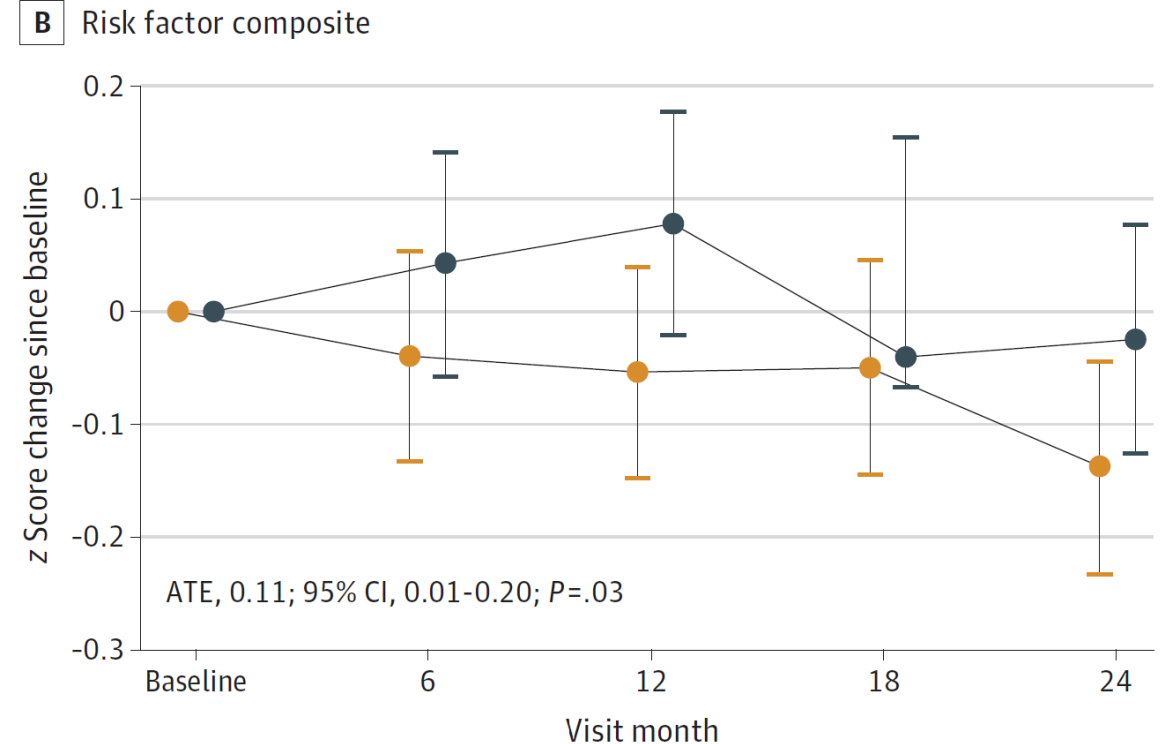
Primary outcome: Change Neuropsychological Test Battery (NTB) scores

Secondary outcome: Change in risk factors and quality of life (QOL)

The Systematic Multi-Domain Alzheimer Risk Reduction Trial: SMAART) (2024)



2-year, personalized, multidomain pilot RCT for ADRD risk reduction: Older adults without dementia and with > 2 dementia risk factors demonstrated improvements in composite measures of cognition, dementia risk factors, and QOL compared with those randomized to the health education



Evidence for Multi-Lifestyle/Behavior Changes on Cognitive Performance (2025)

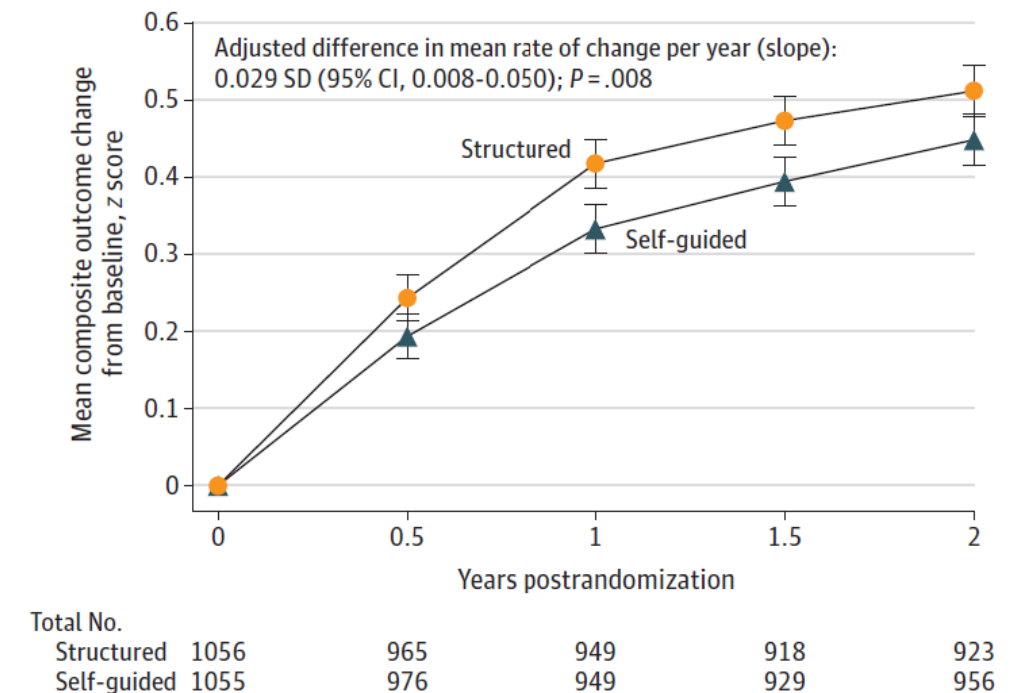


U.S. POINTER: Study to Protect Brain Health Through Lifestyle Intervention to Reduce Risk

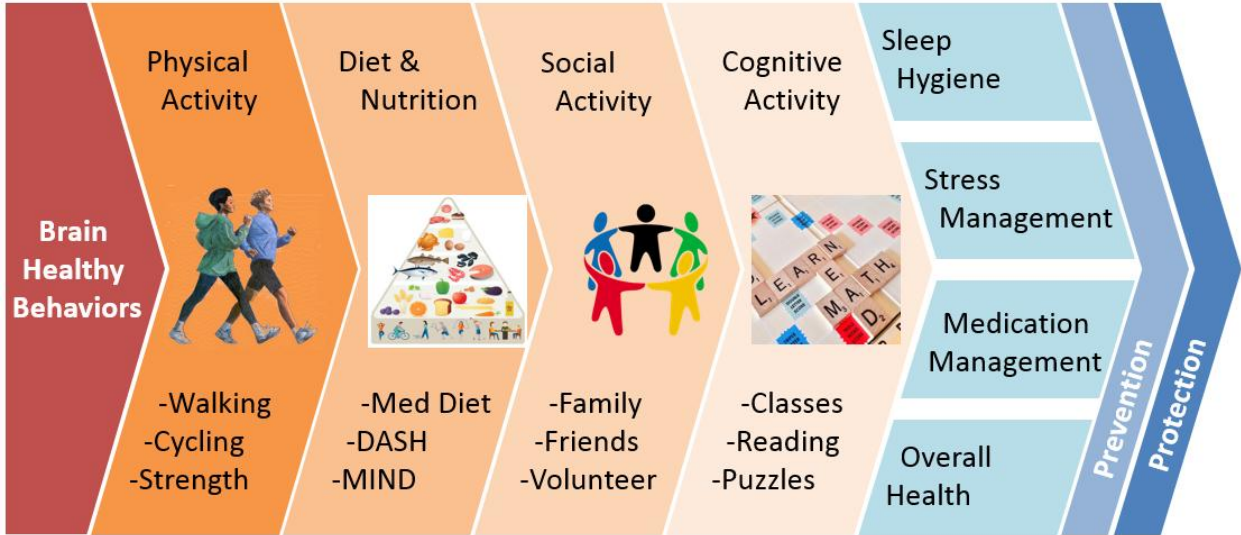
- Multi-site randomized 2-year clinical trial of 2111 older adults, age 60-79, at risk for cognitive decline (by validated risk score)
 - Intensive, structured lifestyle intervention of moderate- to high-intensity physical exercise, adherence to MIND diet, cognitive and social engagement, vascular health monitoring
 - Self-guided (same goals)

Structured, higher-intensity lifestyle intervention had a greater benefit on global cognition than the self-guided, low-intensity intervention.

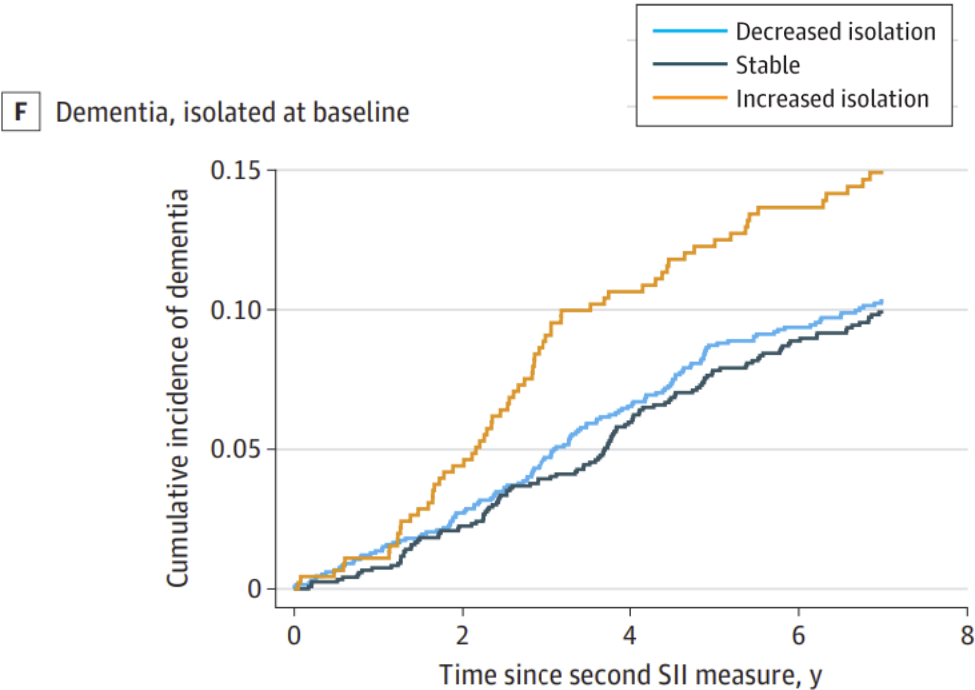
Figure 3. Change From Baseline in Global Cognitive Function Composite Score (Primary Outcome) by Structured vs Self-Guided Lifestyle Interventions



Evidence for Multi-Lifestyle/Behavior Changes on Cognitive Performance (2025)



F Dementia, isolated at baseline



No. at risk				
Decreased isolation	1325	1289	1222	1115
Stable	1200	1173	1112	1026
Increased isolation	454	434	400	366

Guidelines for overall health and dementia risk reduction



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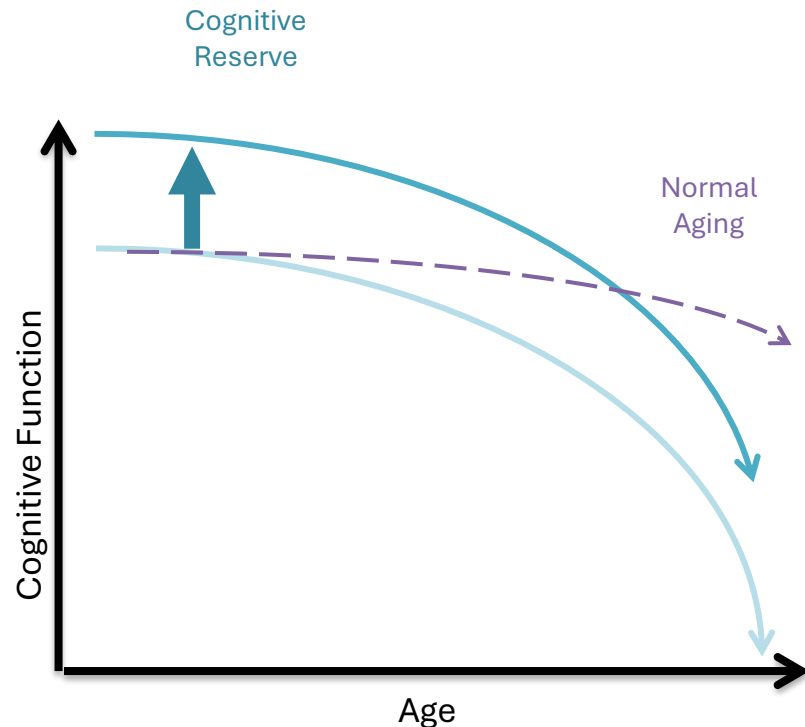
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Taking care of your health conditions

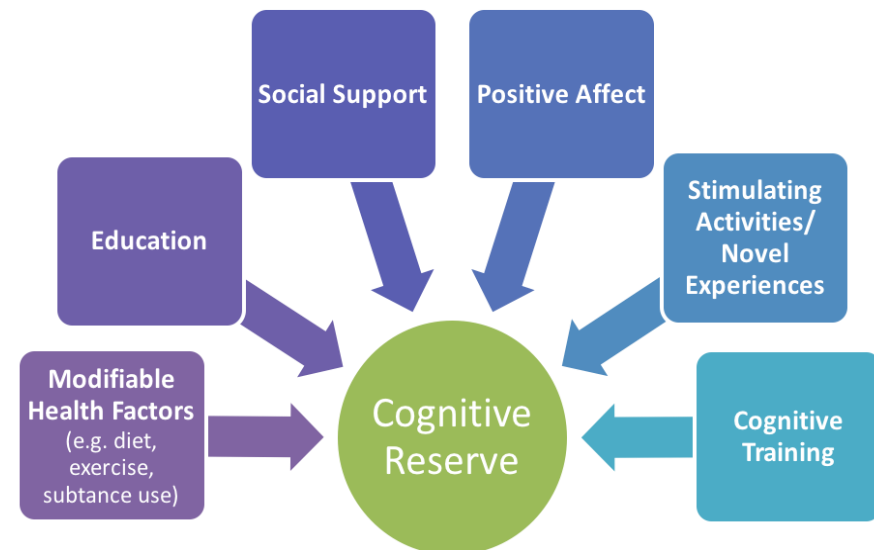
- **High blood pressure**
 - Accelerates atherosclerosis and reduces blood flow to the brain
 - ▶ **Keep below 120/80 mm Hg**
- **High cholesterol**
 - Increases the risk of stroke and may increase amyloid buildup in the brain
 - ▶ **Keep below 180 mg/dL**
- **Diabetes**
 - Causes inflammation and disrupts glucose metabolism in the brain
 - ▶ **Keep blood sugar between 100 mg/dL and 140 mg/dL**
- **Metabolic syndrome**
 - High blood pressure, excess fat, low HDL cholesterol and high blood sugar
 - ▶ **Keep BMI between 18.5 and 24.9**
- **Depression**
 - Associated with high cortisol levels and chronic inflammation in the brain
 - ▶ **Meet with your doctor if you are experiencing symptoms**

Cognitive Reserve

- **Cognitive reserve:** Individual differences in how people process tasks/perform cognitively allow some to cope better than others with brain pathology and neuropsychiatric disorders



- **Contributions to cognitive reserve/brain resilience:** educational attainment, cognitively challenging activities, maintaining large/active social network, treating depression, positive affect





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Thank you.