Brain Health Matters; What You Can Do To Keep Your Patients From Cognitive Decline As They Age

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Disclosures

I have no relevant relationships with ineligible companies to disclose within the past 24 months. (Note: Ineligible companies are defined as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.)

UsAgainst Alzheimers, Brain Health Partnership Provider Leadership Group, AAPA representative

NYU BOLD Public Health Center for Excellence (PHCOE), Advisory Committee member

Objectives

Identify risk factors across the life course that have been shown to be associated with increased risk for cognitive decline with age

Identify patients with high risk for cognitive decline in middle age

Describe strategies that can be used in clinical practice to improve brain health among those at higher risk for cognitive decline with increasing age

What is Brain Health?

"an emerging and growing concept that encompasses neural development, plasticity, functioning, and recovery across the life course."

World Health Organization

Why is this topic important?

Managing a dozen risk factors could prevent or delay about 40 percent of worldwide dementia cases (Lancet Commission 2020)

Dementia risk can be modified by brain healthy behaviors

- effective management of hypertension, diabetes, and obesity

Exponential rise in dementia projected over next four decades (2020-2060) especially among African Americans and Latinos[1]

- 200% rise in the number of African Americans
- 440% rise in the number of Latinos
- 69% increase among non-Hispanic Whites

Medical providers *could* make a difference, but do not address brain health as a part of routine care

1 Matthews, K et al., "*Alzheimer's & Dementia*, 2019

Nation Alzheimers Project Act (NAPA) Goals

1. Prevent and Effectively Treat Alzheimer's Disease and Related Dementia by 2025
2. Enhance Care Quality and Efficiency
3. Expand Supports for People with Alzheimer's and Related Dementias and Their Families
4. Enhance Public Awareness and Engagement
5. Improve Data to Track Progress
6. **Reduce the Burden of Risk Factors for Alzheimer's Disease and Related Dementias***

"Cognitive decline is not inevitable. With this new national goal, the United States commits to focus not only on treatment, but on preventing Alzheimer's and related dementias in the first place." *H. Becerra, Secty HHS*

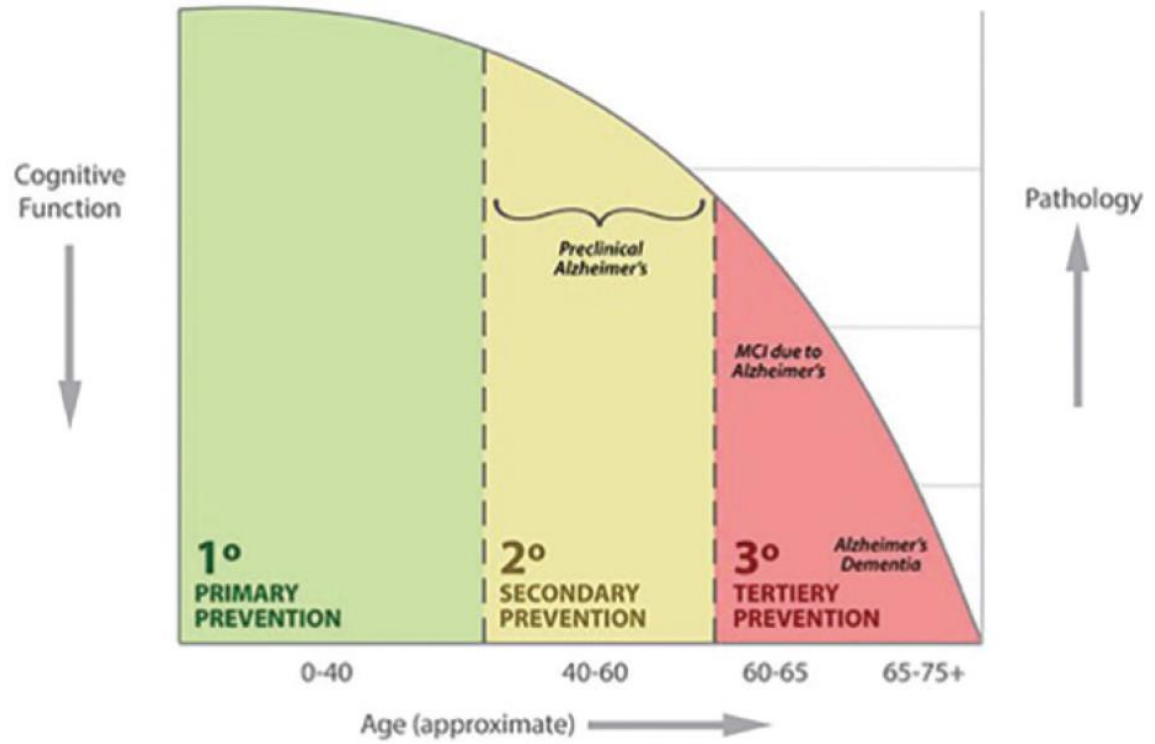
* Added 12/27/2021

Lifespan Approach to Promote Brain Health

Child
- Early education
- Obesity reduction

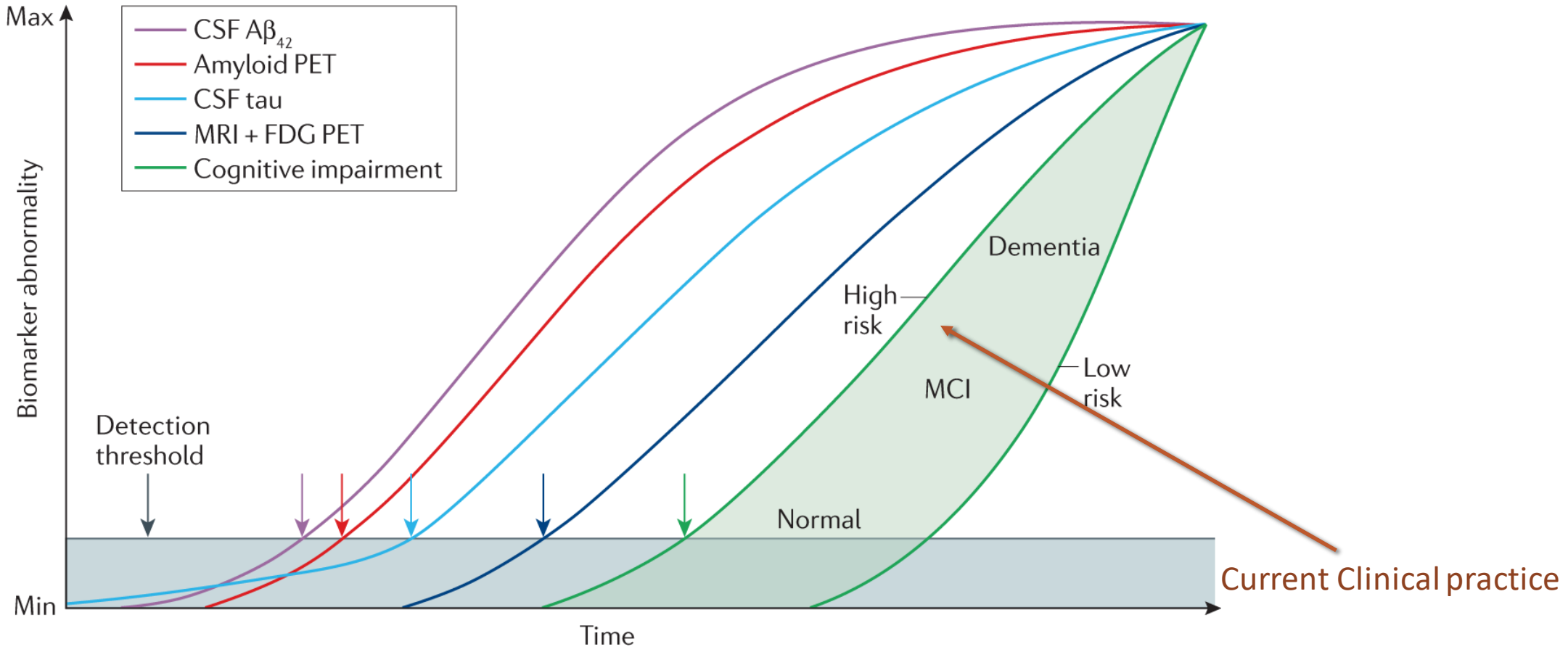
Adolescent/Young Adult
- High level of education
- Head injury prevention
- Minimize drug and alcohol use

Adult
- Vascular risk factor management
- Sleep hygiene
- Treat depression



HEALTHY DIET & REGULAR EXERCISE AT ALL AGES

Neurodegenerative disease pathology (AD) begins 1-2 decades prior to cognitive symptoms



Subjective Cognitive Decline

10.8% of adults aged 45 years or older reported SCD
- Prevalence varied by race and ethnicity
  - 10.7% Whites
  - 12/3% Blacks
  - 9.9% Hispanics

1 or more chronic conditions associated with SCD
  - 64.0% Whites
  - 79.1% Blacks
  - 64.1% Hispanics

By race and ethnicity, Hispanics and Blacks with SCD were more likely to report functional limitations compared to whites

Less than half of AA or Hispanics with SCD have discussed their symptoms with a medical provider

Higher burden of chronic conditions and adverse social determinants among Blacks and Hispanics with SCD, predict worse cognitive health outcomes

Gupta, S. BMC Pub Hlth 2021

Risk Factors

IDENTIFICATION OF MODIFIABLE RISK IS KEY

Risk Factors for Cognitive Decline

AGE*

Family history
- Genetics

Education level

Brain Injury (TBI)

Pesticide or toxin exposure

Physical inactivity

Social Isolation

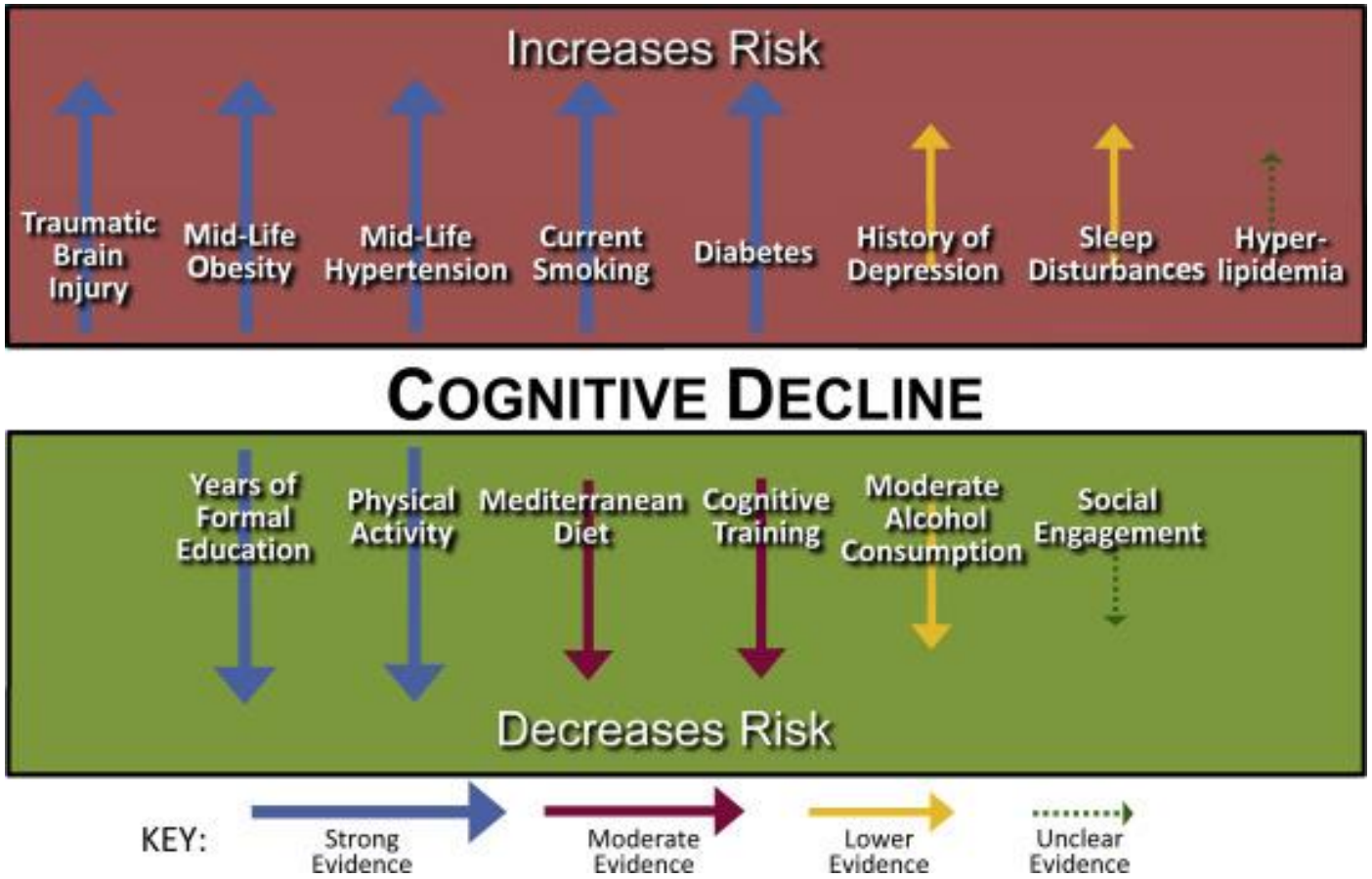
Hearing loss

Depression

Chronic medical conditions
- HTN
- Diabetes (Type 2)
- Heart Disease
- Stroke
- Parkinson's disease

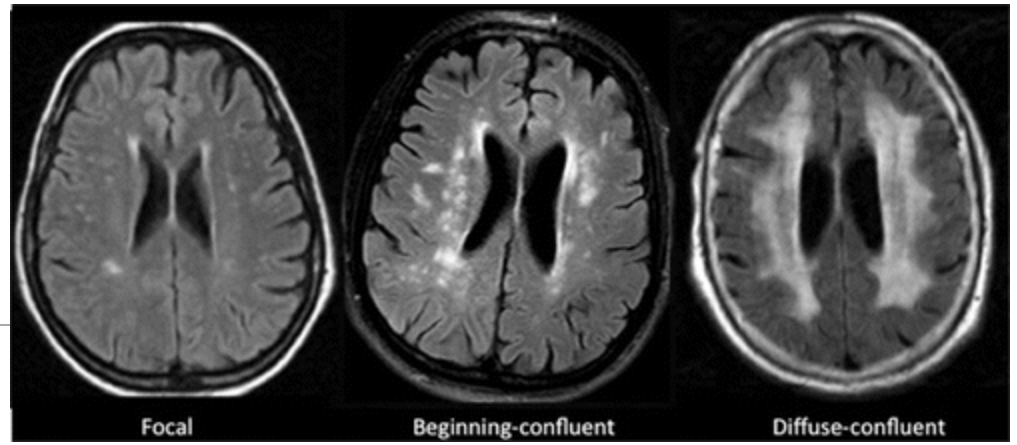
* No known prevention or intervention

Evidence of Risk Factor Impact on Cognition



M.Baumgart et al, Alz & Dem 11(6):2015.

Hypertension



Hypertension increases risk for cognitive impairment and dementia

- Vascular & AD

Causes pathological alterations in cerebral microvessels

- Contribute to the genesis of cerebral microhemorrhages, lacunar infarcts and white matter injury associated with cognitive decline.

Persistent midlife hypertension associated with increased risk for late life dementia[1]

HTN is risk factor for white matter hyperintensities on MRI[2]

1. Lancet 2020
2. Skoog I. Dement Geriatr Cogn Disord 1998;9 suppl1:13-9

Studies Support BP Control to Decrease Dementia Risk

Framingham Offspring cohort (**n** 1440) showed elevated SBP (≥140mmHg, mean age 55y) associated w/ increased risk of developing dementia (**HR** 1.6) over 18y follow-up (McGrath et al, 2017)

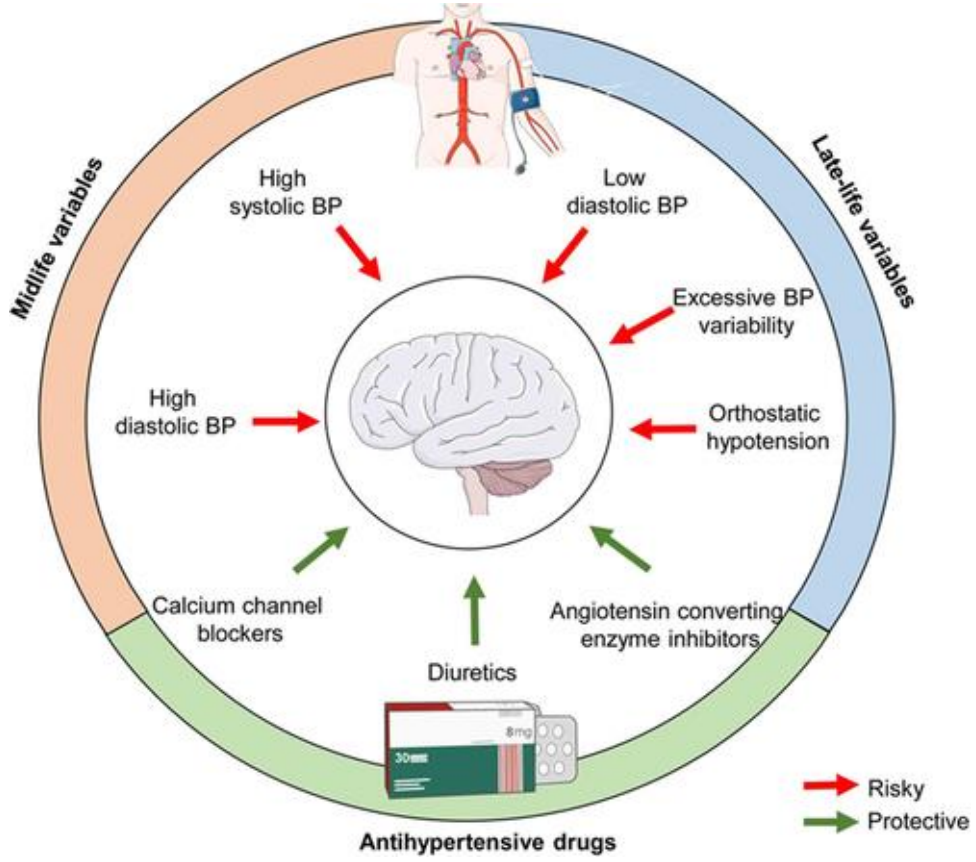
- Risk increased further if HTN persisted into later life (**HR** 2.0, mean age 69y) (Pase et al, 2016)
  - People with ideal cardiovascular parameters had lower 10-yr risk of all-cause dementia (**HR** 0.8), vascular dementia (**HR** 0.5), and AD (**HR** 0.8)

Midlife HTN associated w/ reduced brain volumes and increased WM hyperintensity volume, but not amyloid deposition (Lane et al, 2019)

SPRINT MIND trial of patients >50 yo showed decreased dementia cases (7.2 vs 8.6 cases / 1000 person-years, **HR** 0.8) and MCI (14.6 vs 18.3 cases, **HR** 0.8) in intensive arm (SBP goal <120) compared to standard (goal SBP <140) (Williamson et al, 2019)

Hypertension and the Brain

Pharmaceutical and/or lifestyle interventions that reduce BP in combination with treatments that promote microvascular health *could potentially prevent or delay cognitive decline* in patients with HTN



Diabetes

Diabetes is a known risk factor for dementia – AD & Vascular

- 1.5-2x increase risk[1]

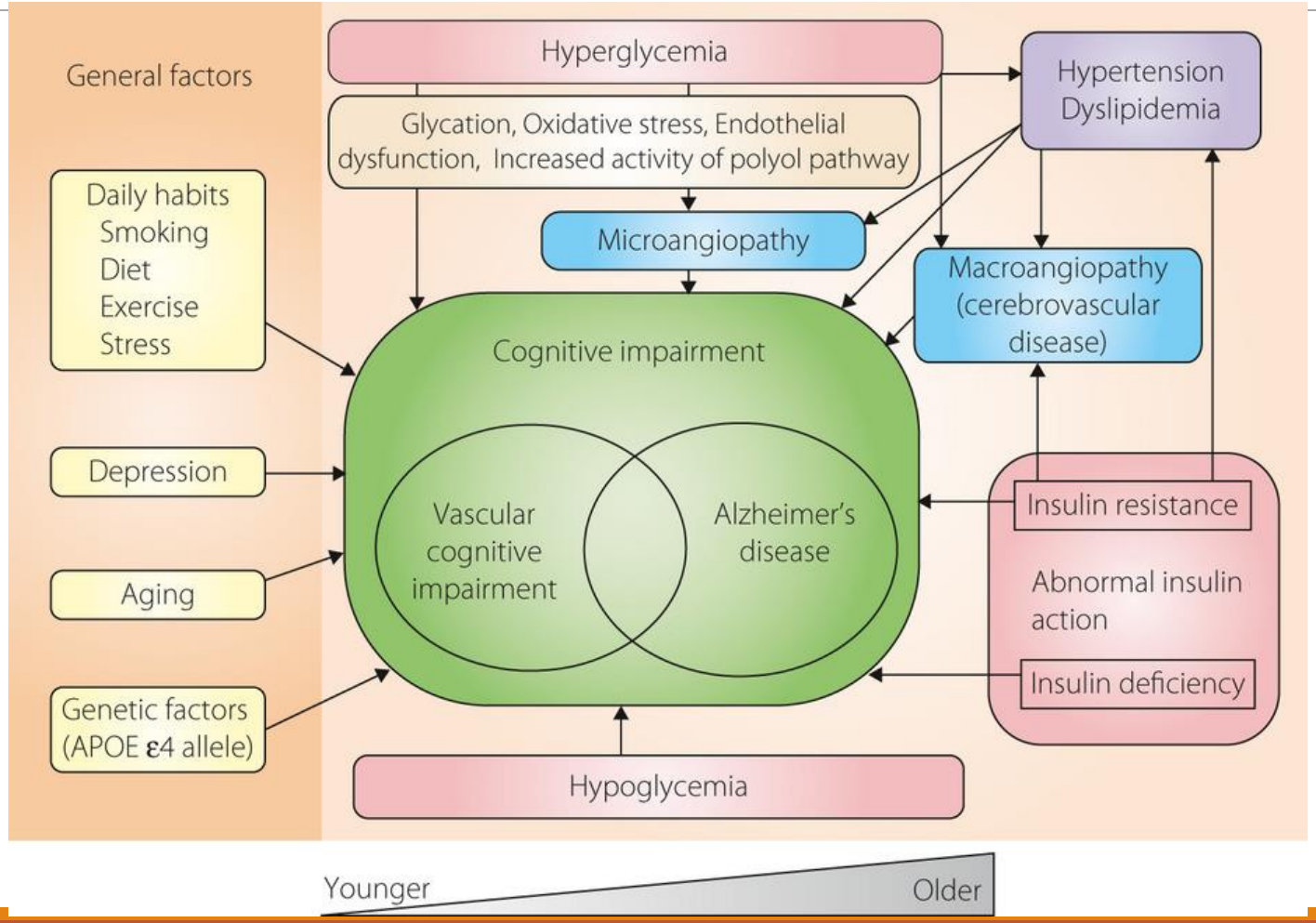
Diabetes in midlife associated with a 19% greater cognitive decline over a 20-year period[2]

Younger age of onset of diabetes associated with increased risk for developing dementia[3]

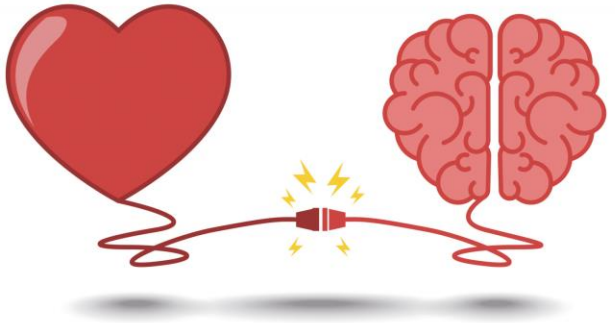
- Diagnosed diabetes <70 yrs were 24% more likely to have dementia than people without type 2 diabetes at age 70
- Younger age at diagnosis of diabetes had dementia at a younger age

1 Barbiellini A, et al *JAMA*. 2021 Apr 27;325(16):1640-1649
2.Rawlings et al *Ann Intern Med 2014;161:785–793*
3.Peila R, *Diabetes 2002;51:1256–1262*

Proposed mechanistic contribution to cognitive impairment in diabetes mellitus



Heart Disease



Cardiovascular disease and dementia have shared risk factors

Heart disease doubles risk for MCI

Lower cardiac output and worse left ventricular diastolic function linked to executive function deficits

Possible mechanisms linking CVD and CI/dementia

- Altered clearance of brain toxins, increasing neurodegeneration
- Altered cerebral perfusion
- Subclinical strokes

Early intervention most beneficial:

CVD risk has strongest relationship with cognition when measured *years before* the onset of dementia.

Obesity and Cognition

Obesity in mid-life is a predictor of mild cognitive impairment at old age

Negative correlation between BMI and global cognitive performance[1]

Impairment in executive function and short-term memory consistently identified in obese individuals compared to normal weight counterparts[2]

Increased adiposity has been correlated with reduced volume in a number of brain regions

- Smaller hippocampal volumes in adolescents with metabolic syndrome[3]

1 Hassing et al. Dement. Geriatr. Cogn. Disord (29): 2010
2 Sabia et al. Am. J. Epidemiol (170): 2009
3 Yau et al. Pediatrics (130): 2012.

Risk Reduction

DECREASE RISK & IMPROVE BRAIN HEALTH THROUGH HEALTHY LIFESTYLE

Nutrition (Diet)

What we eat affects the way we feel, *think and behave*

Eating certain foods -- and avoiding others -- slows brain aging by 7.5 years, and lessen the chances of developing Alzheimer's disease

Emphasize foods that:

- Minimize inflammation and insulin resistance
- Nourish neurons and enhance synaptic connections

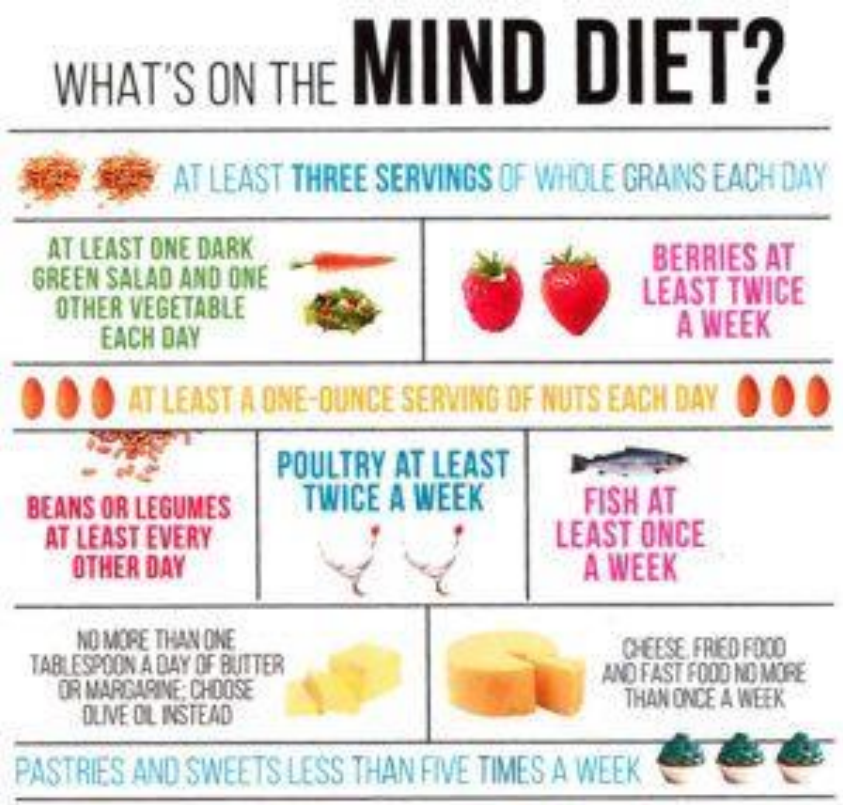
MIND* Diet (Mediterranean-DASH Intervention for Neurodegenerative Delay)

Brain-healthy food groups

- Green leafy vegetables & other vegetables
- Nuts
- Berries (especially blueberries and strawberries)
- Beans
- Whole grains
- Fish or poultry
- Olive oil
- Red wine

Unhealthy food groups

- Red meats
- Butter and stick margarine
- Cheese
- Pastries and sweets
- Fried or fast food



* Mediterranean + DASH (Dietary Approach to Stop Hypertension)

SLEEP

A GOOD NIGHT'S SLEEP IS ESSENTIAL FOR BRAIN HEALTH

Sleep is restorative to brain health and cognition

- CSF flushes out toxins that accumulate from neuronal activity
- "slow waves" that characterize deep, non-REM sleep contribute to memory consolidation

Sleep quality, quantity, and sleep-disordered breathing associated with cognitive impairment

- OSA leads to deficits in executive functions, attention, and memory.

Sleep deprivation associated with daytime cognitive impairment (CI)

60 to 70% of people with cognitive impairment or dementia have sleep disturbances

Poor sleep is a risk factor for Alzheimers disease

RECOMMENDATION: Assess annually, avoid use of sleep medications

PHYSICAL ACTIVITY (Exercise)

Regular physical activity is good for heart, bones, muscles *and brain*

Exercise promotes brain plasticity

- stimulates growth of new connections between cells
- Increases growth factors in the brain that facilitate new neuronal connection

Cognitive decline is almost twice as common among adults who are inactive compared to those who are active[1]

Physical activity has beneficial effects on cerebrovascular and cognitive functions[2]

RECOMMENDATION: 150 minutes [2 ½ hours] per week of moderate intensity for adults over age 45 (ACC/AHA, 2019)

2 Rêgo M.et al. *Clin. Med. Insights Cardiol*. 2019;

Social Activity/Engagement

Social engaged lifestyle promotes cognitive functioning in mid-life, but it may not prevent cognitive decline in older age[1]

Older adults with higher social activity had less cognitive decline in later life than inactive peers[2]

Loneliness and social isolation in mid and late life are associated with cognitive decline[3]

RECOMMENDATION: Be aware of risks for social isolation, routinely inquire about social support and activities, encourage community referrals & connections

[1] Kats et al. Age and Ageing (45) 2016
[2] James BD et al. J Int Neuropsychol Soc 2011
[3] Lara, E., et al. Int J Geriatr Psychiatry (34) 2019

Change of Focus: From Dementia to Brain Health

Cognitive decline is *not* part of normal aging

Cognitive decline can be prevented or delayed in many individuals

Changes that result in cognitive decline begin *years or decades prior* to development of clinical symptoms

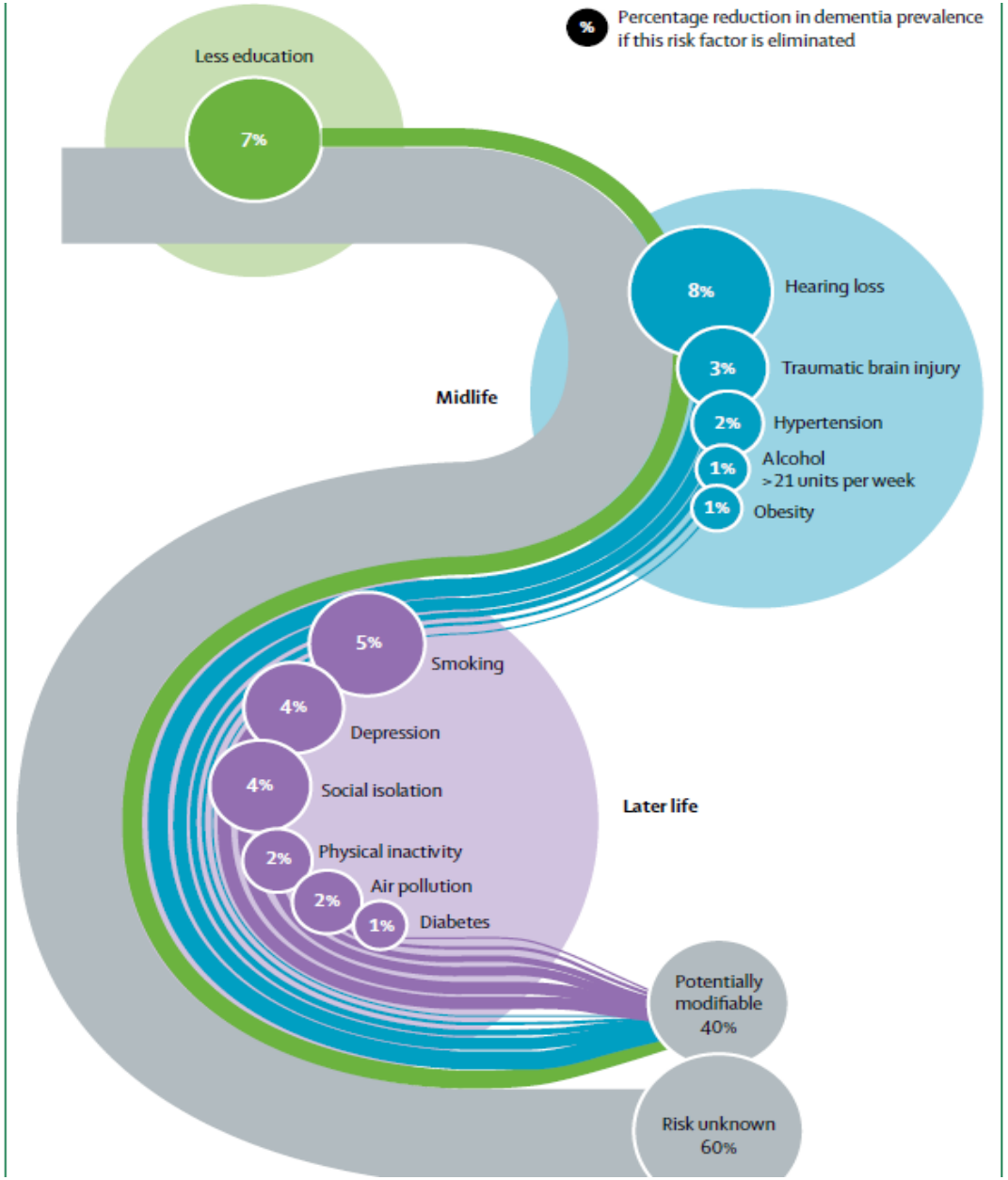
Changes in provider attitudes and behavior can result in delaying or preventing cognitive decline

Brain Health Check-Up

Addition of a cognitive screen into routine care

- Medicare annual wellness exam
- Annual evaluation
- Chronic disease management
  - Hypertension
  - Diabetes
  - Post-stroke
  - Heart Disease

Proposed Pathway: Risk Factor Modification to Prevent/Delay Dementia

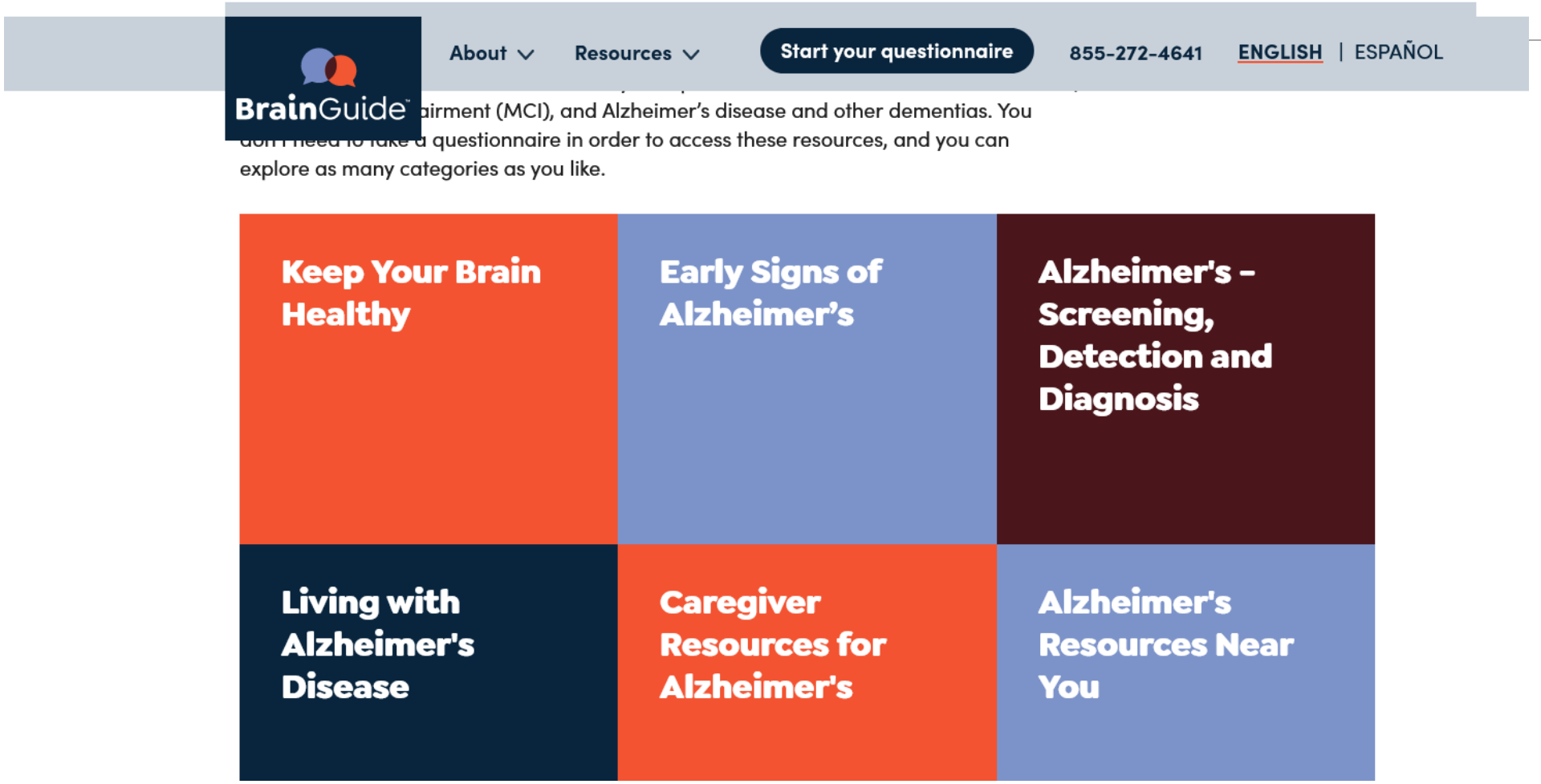


Lancet Commission 2020

Resources

PROVIDER AND PATIENT INFORMATION TO HELP YOU MAKE PRACTICE CHANGE

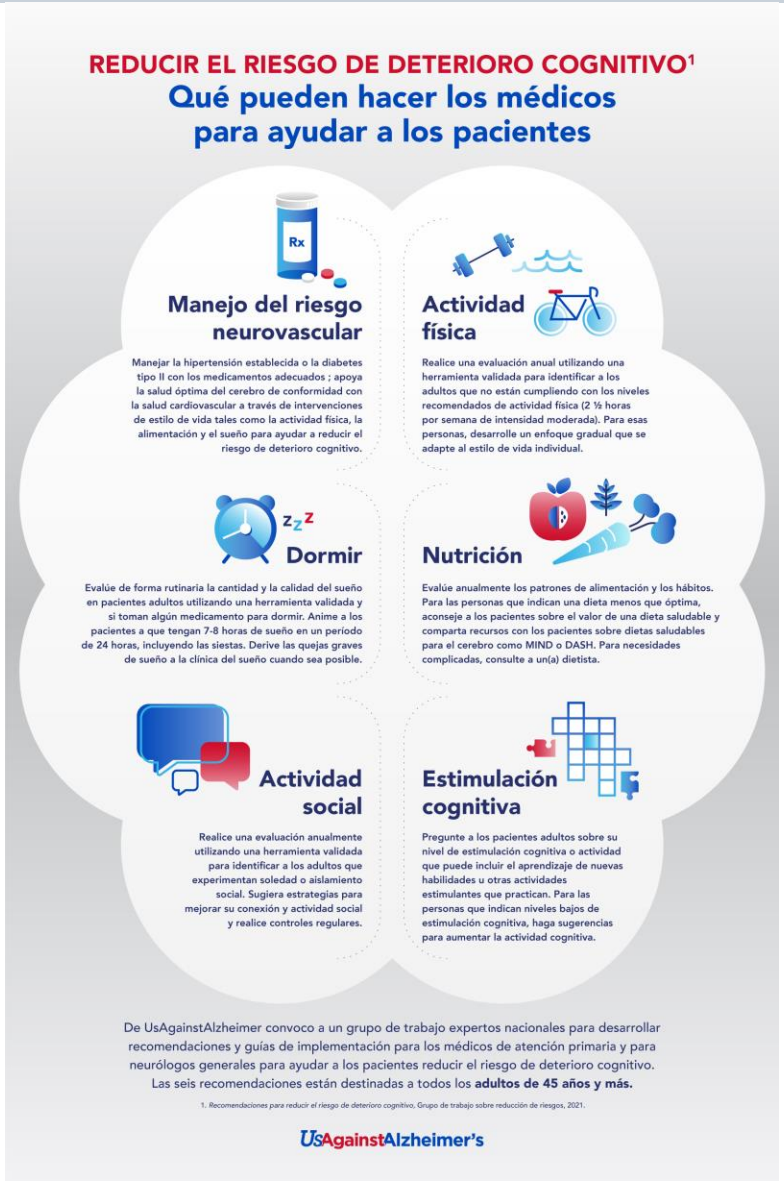
USAgainst Alzheimers



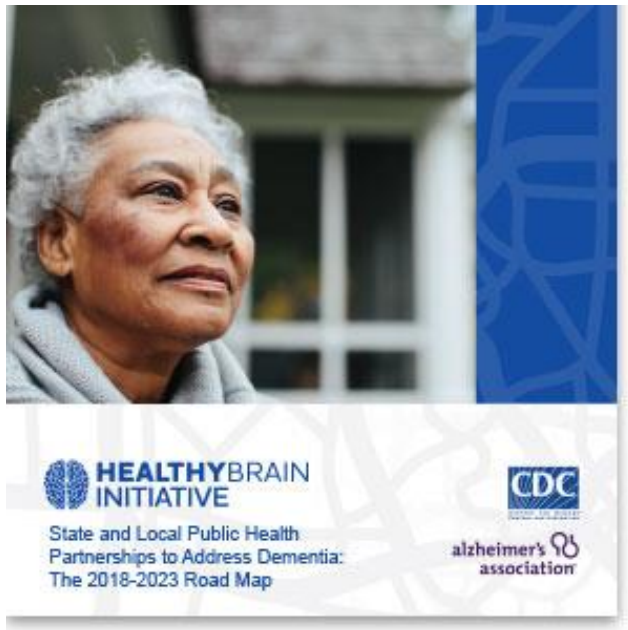
RISK REDUCTION WORKGROUP

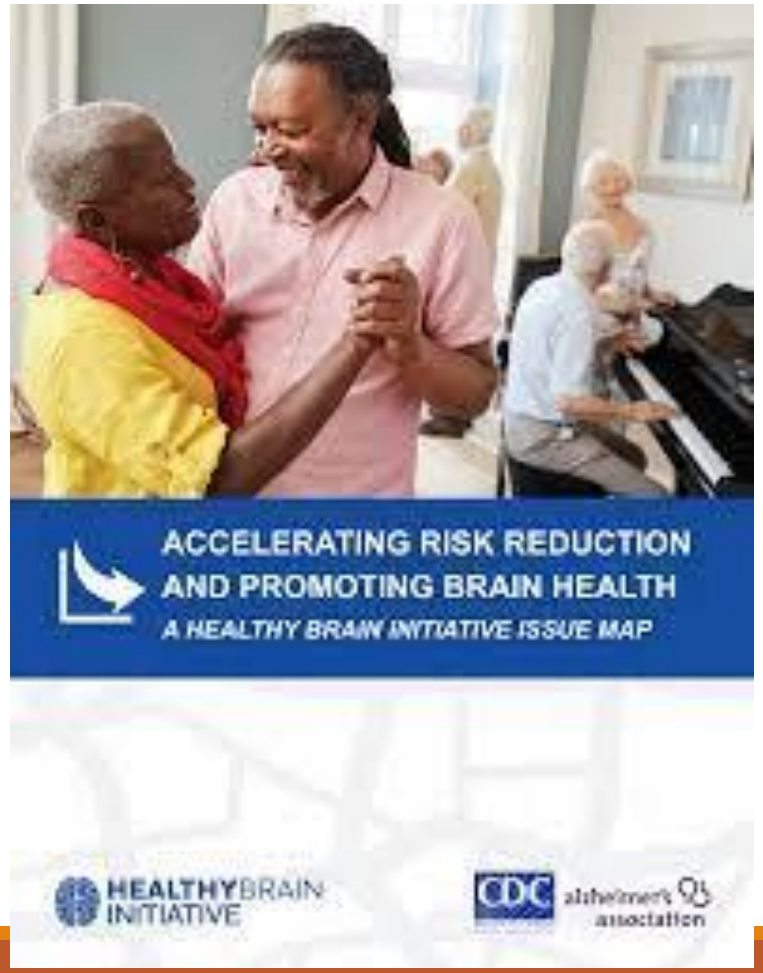
Recommendations

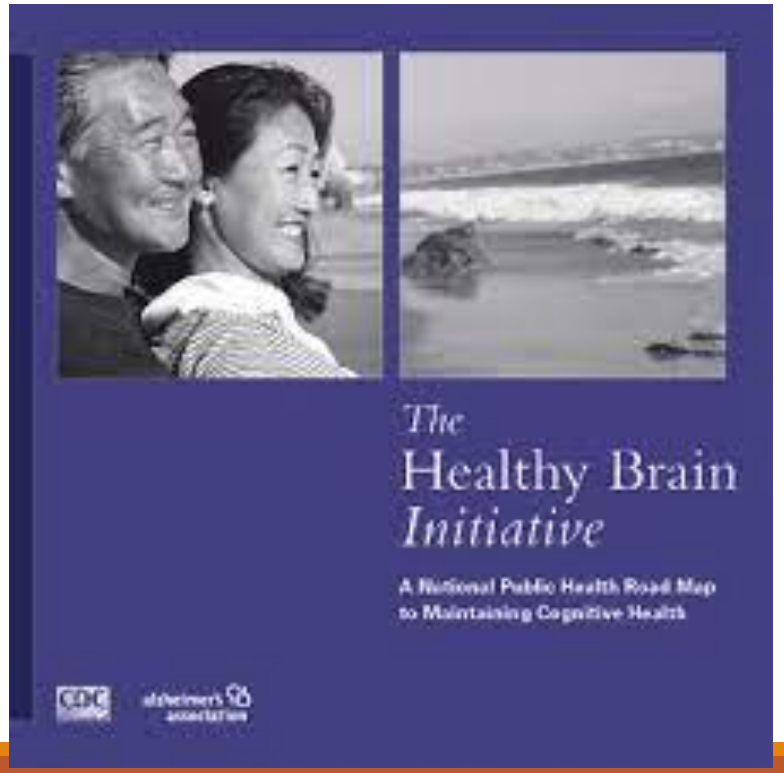
US AGAINST ALZHEIMERS



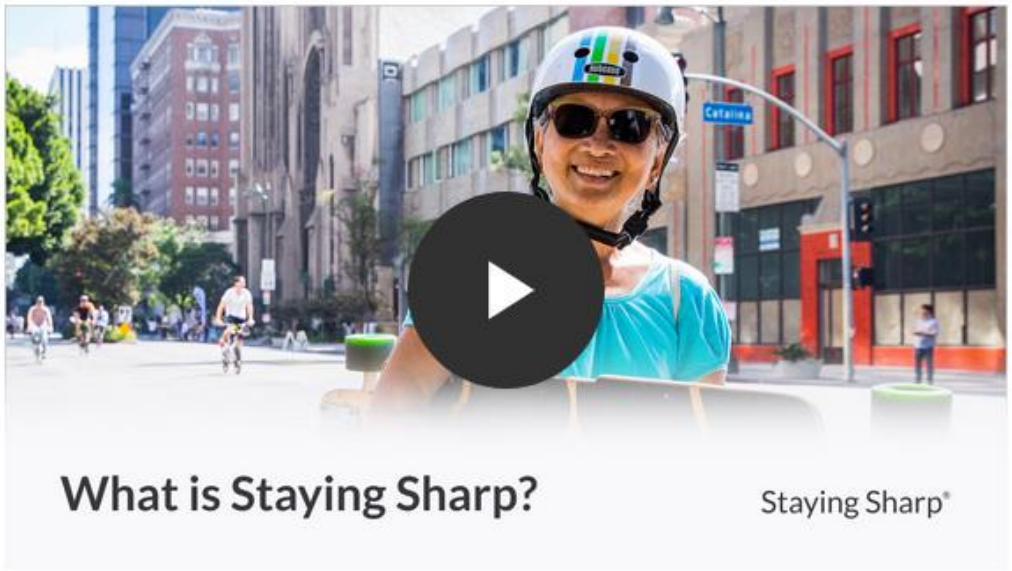
Healthy Brain Initiative: CDC & Alzheimers Association







AARP



What Is Staying Sharp?

Staying Sharp is a program that shows you how to incorporate the six pillars of brain health into your daily life. The pillars follow guidance from the Global Council on Brain Health whose goal is to provide simple steps people can take every day to learn about their brains and live life to the fullest.

Includes a Brain Health Assessment, healthy lifestyle videos, fun and interactive challenges/activities

References

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- Lancet Commission, 2020 Dementia prevention, intervention, and care: 2020 report of the Lancet Commission
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Thank You
QUESTIONS?