




Healthy Brain Aging

Alabama Academy of Neurology 2024 Conference
August 17, 2024

Ronald M. Lazar, PhD, FAAN, FAHA
 Evelyn F. McKnight Endowed Chair
 Professor of Neurology and Neurobiology
 Director, UAB McKnight Brain Institute
 Director, Neuropsychology Division






Relevant Disclosures

None













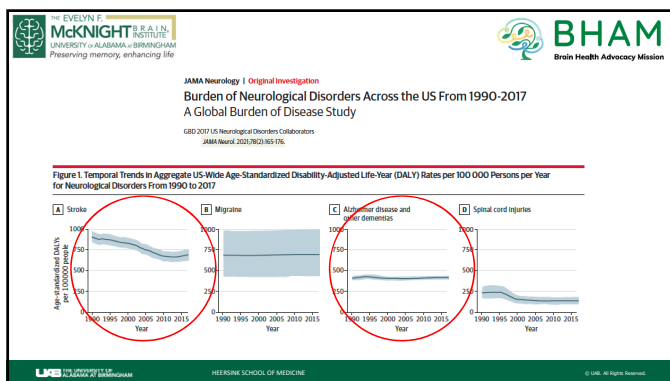
Good Brain Health

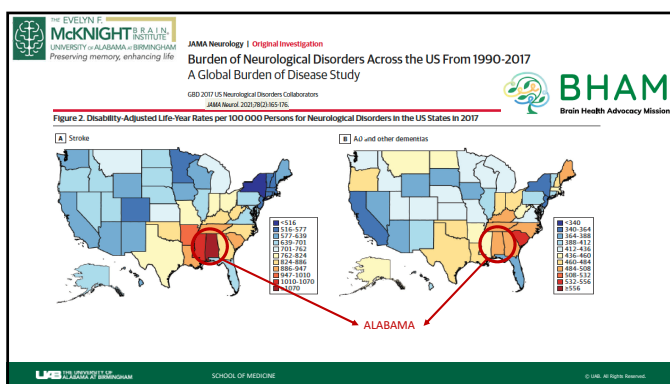
3 Dimensions

- ❑ Clinically: The absence of cognitive impairment from disease.
- ❑ Pathologically: The absence of neurodegenerative, cerebrovascular, neoplastic or other disease that interferes with everyday physical and cognitive functioning.
- ❑ Pragmatically: The preservation of neuronal function to meet the demands of everyday life, operationally defined in terms of the capacity to function adaptively in one's environment.
 - Cognition
 - Mobility
 - Emotional Status

} Emphasis on Positive Biological States





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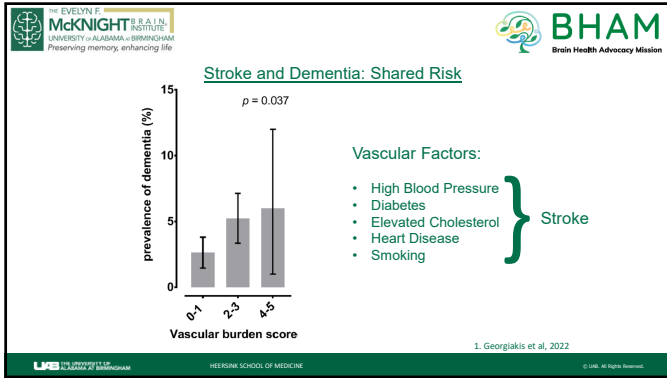
BHAM Brain Health Advocacy Mission

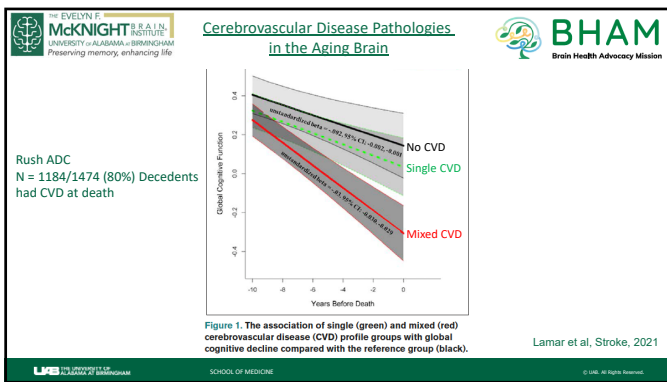
Economic Impact (2016)

- Neurological disorders: Cost patients and healthcare \$800B (Military budget=\$598B)
- In the next 10 - 20 years, the cost of neurological care will be twice the military budget
- By 2030, estimated \$600B for stroke and dementia alone


Gooch, Pracht, Borenstein, Ann Neurol, 2017

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We are missing an extraordinary opportunity to **SAVE our brains!!**



- 80% of strokes are **preventable** (CDC, 2017)
- 45% of dementia cases are **preventable** (The Lancet, 2024)

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Potentially Modifiable Risk Factors for Dementia

- Reduce diabetes
- Manage cholesterol
- Minimize hypertension
- Stop Smoking
- Reduce Obesity
- Reduce air pollution
- Prevent head injury

- Prevent or treat depression
- Physical Activity
- Minimize alcohol intake

- Higher education or continue cognitive activity
- Prevent and address hearing loss
- Address visual loss
- Increase social contact

Adapted from Livingston et al, 2024

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What is holding us back? Current US Population: ~342M

- > 116M in the US have hypertension
- > 32.4M with diabetes
- > 42.4% of US population are obese (up ~12% in last 20 years)
- > 18% continue to use a nicotine product
- > 50% of the US does not meet physical activities guidelines

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Brain Health Blood Pressure Control

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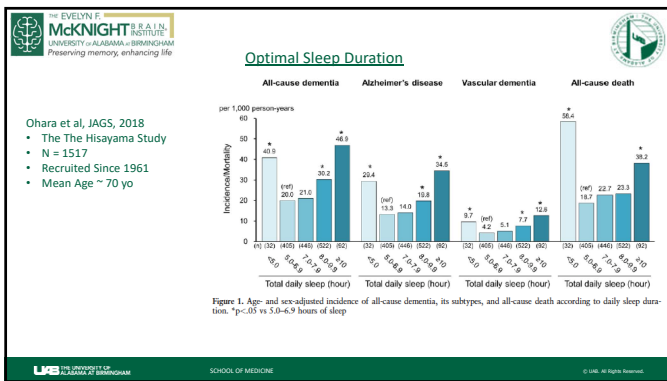
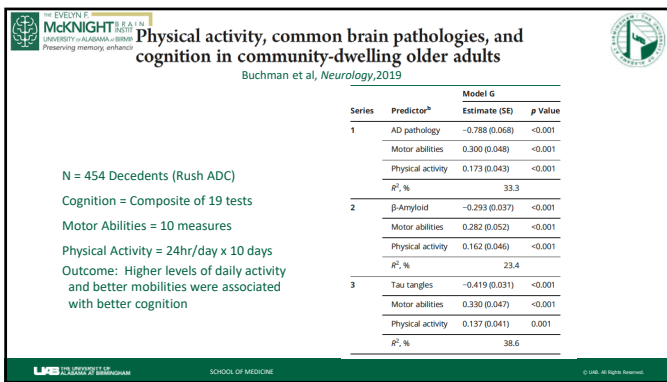
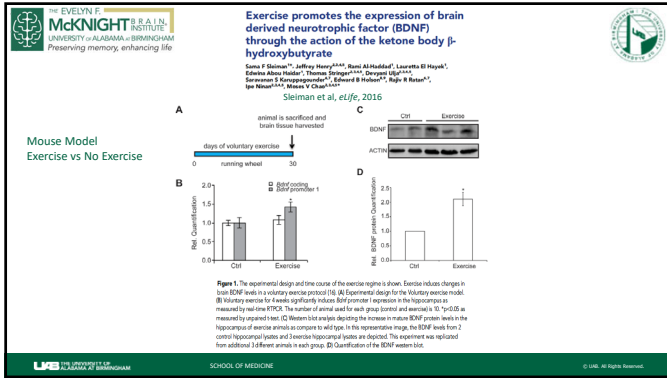
    graph TD
      Hypertension --> BBB_Disruption[BBB Disruption]
      Hypertension --> Small_Vessel_Disease[Small Vessel Disease]
      Hypertension --> Atherosclerosis[Atherosclerosis]
      
      BBB_Disruption --> Upregulated_Receptor[Upregulated Receptor for Advanced Glycation End Products]
      BBB_Disruption --> Increased_BBB_permeability[Increased BBB permeability]
      BBB_Disruption --> Decreased_AB_Clearance[Decreased AB Clearance]
      
      Upregulated_Receptor --> Increased_AB_transport[Increased AB transport across BBB]
      Increased_AB_transport --> Increased_AB_accumulation[Increased AB Accumulation]
      
      Increased_AB_accumulation --> Neurodegeneration[Neurodegeneration]
      Neurodegeneration --> Alzheimers_Disease[Alzheimer's Disease]
      
      Small_Vessel_Disease --> Decreased_Cerebral_Blood_Flow[Decreased Cerebral Blood Flow and Inflammation]
      Decreased_Cerebral_Blood_Flow --> Increased_AB_production[Increased AB production]
      Increased_AB_production --> Increased_AB_accumulation
      
      Atherosclerosis --> Cerebral_Haemorrhage[Cerebral Haemorrhage/Infarction]
      Cerebral_Haemorrhage --> Vascular_Dementia[Vascular Dementia]
      
      Hypertension --> Hypoxia[Hypoxia]
      Hypoxia --> Increased_AB_production
      
      Alzheimers_Disease --- Current_Opinion[CURRENT OPINION IN PSYCHIATRY]
      Vascular_Dementia --- Current_Opinion
  
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Lennon et al, *Curr Opin Psychiat*, 2021

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AHA SCIENTIFIC STATEMENT


A Primary Care Agenda for Brain Health


A Scientific Statement From the American Heart Association



The American Academy of Neurology affirms the value of this statement as an educational tool for neurologists.

Ronald M. Lazar, PhD, FAHA, Chair; Virginia J. Howard, PhD, FAHA, Vice Chair; Walter N. Kernan, MD; Hugo J. Aparicio, MD, MPH; Deborah A. Levine, MD, MPH; Anthony J. Viera, MD, MPH; Lori C. Jordan, MD, PhD; David L. Nyenhuis, PhD; Katherine L. Possin, PhD; Farzaneh A. Sorond, MD, PhD; Carole L. White, PhD, RN; on behalf of the American Heart Association Stroke Council

Stroke, 2021









The Role of the Neurologist




- Unique expertise in the relationships among risk factors and lifestyles, and dementia and stroke
- Discussions can be conducted by physicians, nurses, or technicians
- Applicable to patients with HA, back pain, neuropathy, as well as those with neurological disease (stroke, MCI, MS, etc.): Primary care neurology
- Covered by billing codes

Conclusions

- Cardiovascular risk factor and lifestyle management benefits the brain.
- Studies show that these factors are treatable.
- Treatment appears to lead to primary prevention of cognitive decline and dementia.
- Attention to these factors is lifelong process.



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Brain Health Advocacy Mission (BHAM)
Principal Investigator: Ronald Lazar, PhD
Clinical Director: Pamela Bowen, PhD

Integration into Clinical Practice: Primary Care

BHAM Registry "Clinic within a Clinic"

- UAB Family Medicine Clinics: Hoover and Highlands
- Two afternoon sessions and Two Morning Sessions/clinic/week:
- Administer the McCance Brain Care Score
 - Allow patients to choose up to 3 initial targets
 - Work is small, achievable steps.

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12-month neurological and psychiatric outcomes of semaglutide use for type 2 diabetes: a propensity-score matched cohort study

Di Giorgi et al. eClinicalMedicine, 2024

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