Human Body Physiology

- Kidneys – filter blood waste removal
- Lungs – filter out carbon dioxide
- GI tract – digest & filter out waste

- What about our Nervous System?

SLEEP

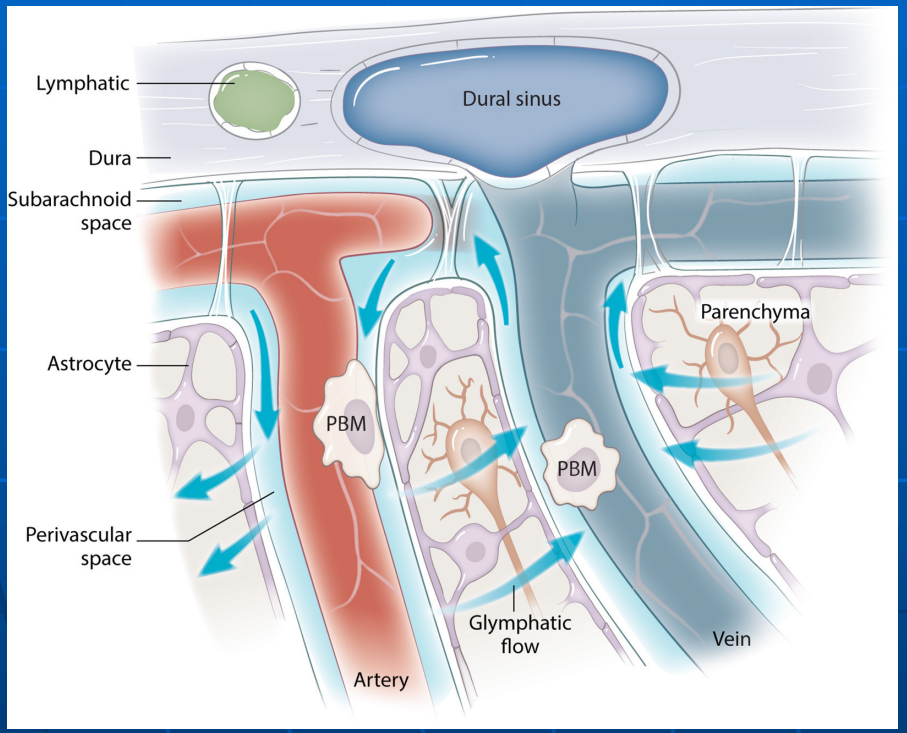
- Universal across the animal kingdom
- Why do we need sleep?
- The reasons remain one of the greatest mysteries in biology

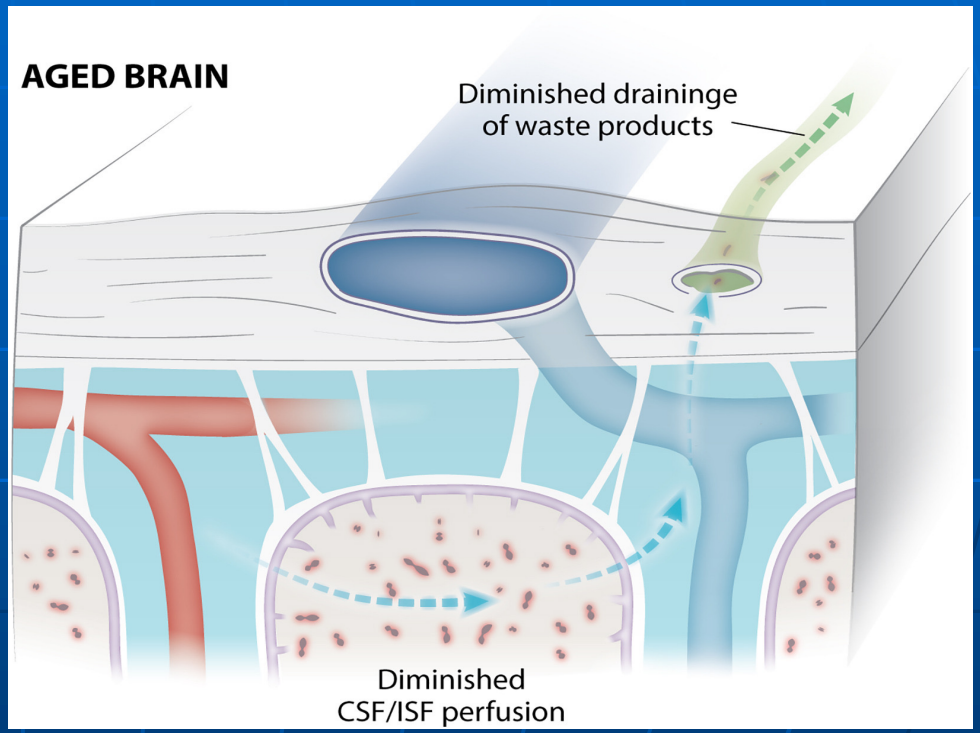
Sleep – Why?

- **Amyloid-beta dynamics are regulated by orexin and the sleep-wake cycle.** Science 2009
- **Sleep drives metabolite clearance from the adult brain** Science 2013
- **Slow wave sleep disruption increases cerebrospinal fluid amyloid-β levels** Brain 2017
- **Effect of sleep on overnight cerebrospinal fluid amyloid beta kinetics** Ann. Neurology 2018
- **The sleep-wake cycle regulates brain tau in mice and CSF tau in humans**. Science 2019
- **Sleep deprivation impairs molecular clearance from the human brain** Brain 2021
- **Neuronal dynamics direct cerebrospinal fluid perfusion and brain clearance** Nature 2024

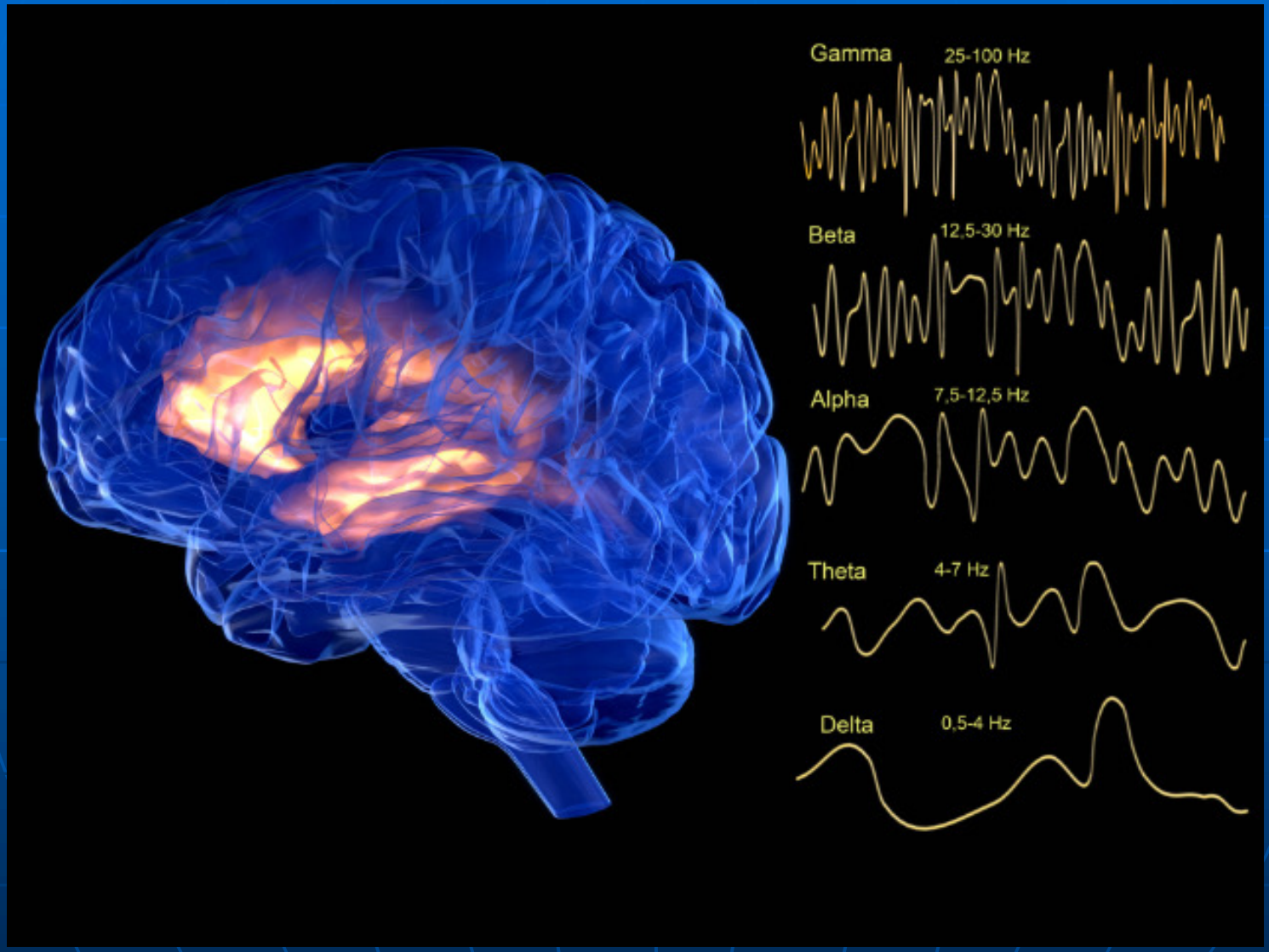
- CONCLUSION: Deep Sleep promotes clearance of metabolic waste from the brain

Deep Sleep = brain pulsating slowly and in sync to remove waste





Sleep – Slow Wave



Sleep – Slow Wave Sleep (SWS)

- 3rd stage of 90-minute sleep cycle
- Lasts for 20-40 minutes
- SWS same as Deep Sleep
- Most restful stage of sleep
- Brain & heart slow, BP drops
- Increased Growth Hormone release

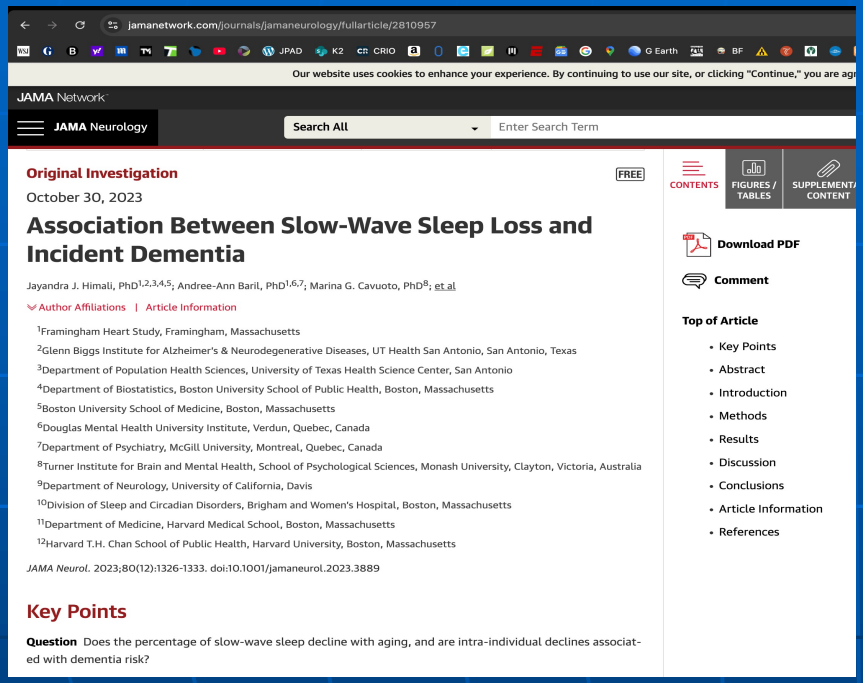
Slow Wave Sleep

- Research suggests that the brain **activates newly acquired memories** during SWS to cement memories into long-term memory.
- SWS may facilitate learning by helping to restore connections between brain cells

You need more SWS!

- SWS augments clearance of clumping proteins of AD
- In patients with AD, increased slow wave sleep = better cognition

Lower AD risk by increasing SWS?



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Original Investigation FREE

October 30, 2023

Association Between Slow-Wave Sleep Loss and Incident Dementia

Jayandra J. Himali, PhD[1,2,3,4,5]; Andree-Ann Baril, PhD[1,6,7]; Marina G. Cavuoto, PhD[8]; et al

Author Affiliations | Article Information

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JAMA Neurol. 2023;80(12):1326-1333. doi:10.1001/jamaneurol.2023.3889

CONTENTS | FIGURES / TABLES | SUPPLEMENTAL CONTENT

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Comment

Top of Article
- Key Points
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- Article Information
- References

Key Points

Question Does the percentage of slow-wave sleep decline with aging, and are intra-individual declines associated with dementia risk?

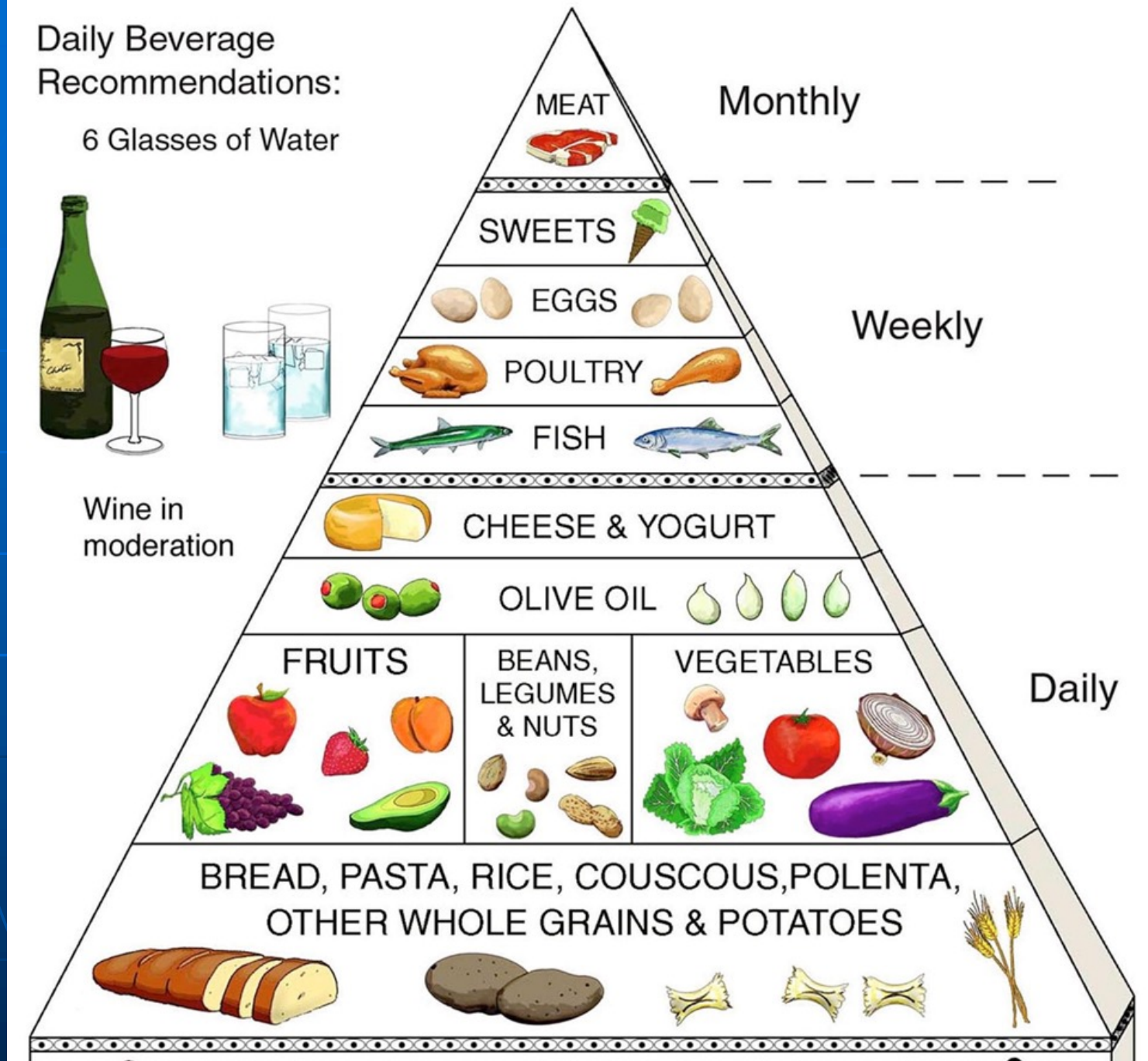
- Framingham Cohort
- 23-year study
- We naturally lose SWS as we age
- **Loss of SWS over time increased AD risk**
- Caveat: Loss SWS = AD OR AD = loss SWS??? More study needed

How to increase SWS

- Warm bath/shower 1-3 hrs before bed (10-30 min at 104)*
- Cool bedroom
- Fiber intake
- Moderate exercise
- Consistent sleep schedule
- White noise/Sleep mask/Ear plugs
- Reduce stress
- No caffeine after 3pm/Limit alcohol

Sleep

- **Framingham study** – Does losing SWS increase AD risk? YES https://jamanetwork.com/journals/jamaneurology/fullarticle/2810957
- **Wash U – Waste clearance from brain **Terrific paper!!****
  https://www.cell.com/neuron/fulltext/S0896-6273(24)00687-1#fig2
- Why deep sleep is important and ways to increase
  https://www.calm.com/blog/how-to-get-more-deep-sleep
- **Nature / Northwestern U – increase SWS by Core Body Temp**
  https://www.nature.com/articles/s41598-024-53839-x
- **U Texas Austin Timing of warm bath/shower before bed to improve SWS**
  https://www.medicalnewstoday.com/articles/325818
- **Hot water bathing in 1,000 older Japanese adults and Sleep improvement**
  https://pmc.ncbi.nlm.nih.gov/articles/PMC8314650/


Daily Beverage Recommendations:
6 Glasses of Water
Wine in moderation
MEAT
Monthly
SWEETS
EGGS
Weekly
POULTRY
FISH
CHEESE & YOGURT
OLIVE OIL
FRUITS
BEANS, LEGUMES & NUTS
VEGETABLES
Daily
BREAD, PASTA, RICE, COUSCOUS,POLENTA, OTHER WHOLE GRAINS & POTATOES

MIND & MOOD

Can a spoonful of daily olive oil ward off dementia death?

News briefs

August 1, 2024

***By Heidi Godman**, Executive Editor, Harvard Health Letter*

Reviewed by **Anthony L. Komaroff, MD**, Editor in Chief, *Harvard Health Letter;* Editorial Advisory Board Member, Harvard Health Publishing

Olive Oil

- Harvard study 92,000 men and women
- 28 years
- 7 gms/day (1.5 tsp) = **28% lower risk of dementia**

Olive oil and Dementia Reduction

- Key Findings from the Study
- In an observational study that spanned nearly 30 years and included over 92,000 participants, researchers found that consuming at least 7 grams of olive oil per day (about half a tablespoon) was associated with a 28% lower risk of dementia-related death. This finding was consistent even after accounting for various factors such as diet quality, lifestyle choices, and genetic predispositions.
- One particularly compelling aspect of this study is that the benefits of olive oil consumption were observed regardless of the overall quality of participants' diets. Typically, individuals who use olive oil tend to have a higher diet quality overall, often following dietary patterns like the Mediterranean diet, which is rich in fruits, vegetables, whole grains, and healthy fats, such as olive oil. However, the study found that even among those with varying diet qualities, higher olive oil intake still provided significant protective benefits against dementia-related mortality.
- This suggests that olive oil alone has powerful health benefits that can contribute to reduced dementia risk, independent of other dietary factors.

”Food Swap”

- How to Maximize the Benefits
- The key to reaping the benefits of olive oil, according to this study, is to replace other dietary fats such as margarine, mayonnaise and butter with olive oil. Here are some ways to increase your olive oil intake:
- Replace bottled salad dressings with simple dressings you make at home by mixing olive oil and vinegar or lemon juice.
- Replace mayo with olive oil in recipes like tuna salad or potato salad.
- Dip bread in olive oil instead of using butter or margarine as a spread.
- Use olive oil as your main cooking fat for sautéing, baking or frying.
- Replace butter on vegetables with a drizzle of flavorful olive oil.
- By making these delicious food swaps, you may not only support your brain health but also benefit from the numerous other health advantages associated with olive oil.

Olive oil – Did you know?

- Olives are fruits that grow on trees
- Extra Virgin Olive Oil (EVOO) is the first cold pressing, unrefined and using no heat to extract oil
- The USDA recommends regular olive oil as a safe oil for deep frying with a smoke point of 410˚ F, compared to the highest smoke point of soybean or peanut oil at 450˚ F.
- Olive oils can be used as a substitute for vegetable oils in baking and give a distinctive flavor. Regular olive oil matches flavor closer to neutral oils, such as canola or a vegetable oil blend

Whole Grains

- Whole grain bread
- Brown rice
- Oats
- Barley
- Corn
- Rye
- Quinoa (also high in protein)

Whole Grains

- 6 or more servings per day
  - High fiber
  - Reduces LDL “bad” cholesterol
  - Lower blood pressure
  - Weight loss
  - Lower inflammation
  - Stabilize insulin levels/blood sugar
  - Promote healthy digestion
  - Reduces risk of heart disease

Whole Grains

- High in fiber
  - 25gm women
  - 35gm men
  - Studies = reduced chronic disease and better weight loss

Whole Grains

- Lower Blood Pressure
  - 12-week study = whole grains lowered blood pressure corresponding to 15% reduction in CV disease and stroke

Is there an easier way?

MIND Diet!!

MIND Diet

- Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND):
  - Can slow memory loss
  - Reduced Alzheimer's dementia risk
  - Reduce chance of brain shrinkage by 70%
  - greater brain volume.
  - less Alzheimer's disease (AD) pathology.

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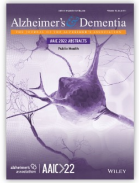


Volume 18, Issue S11
Supplement: Public Health
December 2022
e067178

PUBLIC HEALTH | Free Access

MIND diet associated with less hippocampal sclerosis: A Community-Based Neuropathologic Study

Puja Agarwal, Sonal Agrawal, Laurel J Cherian, Neelum T. Aggarwal, Bryan D James, Thomas Monroe Holland, David A Bennett ... See all authors

First published: 20 December 2022 | https://doi.org/10.1002/alz.067178

Abstract

Background

Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet is associated with slower cognitive decline, reduced Alzheimer's dementia risk, and greater brain volume. We have also shown MIND

Conclusion

Moderate to High adherence to the MIND diet is associated with a 60-**70%** **lower likelihood of hippocampal disease.**

Why might MIND Diet work?

- Fatty Acids (Omega 3 and 6)
- Polyphenols (plant micronutrients)
  - Act as antioxidants

Polyphenols

- Plant micronutrients:
  - 8,000 types (resveratrol, quercitin, capsaicinoids)
  - Powerful Antioxidants (blood vessel health, promote circulation, reduce chronic inflammation; control blood sugars; lower cancer risk; raise immunity)
  - Studies >650mg/day

Polyphenol Foods

- 1. Berries (blue 535mg serving; elderberries 900mg)
- 2. Herbs and spices (Cloves 542mg; peppermint, star anise, oregano, sage, rosemary, thyme)
- 3. Cocoa powder (515mg/tbsp, milk only 35mg UGH!)
- 4. Nuts (chestnuts 350mg/ounce; pecans, almonds)
- 5. Flaxseeds (229mg/tbsp)
- 6. Vegetables (3 cups per day - artichoke s, onion, spinach)

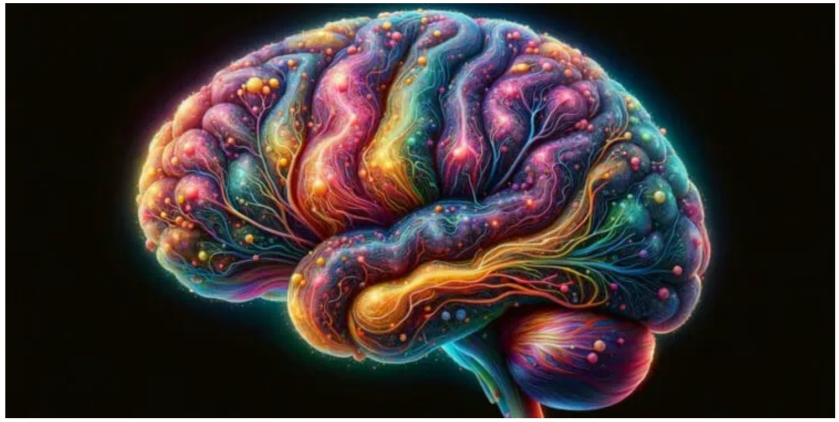
FLAVANOIDS

- BACKGROUND: Fruits are an important source of flavonoids, and greater intake of dietary flavonoids in older adults has been shown to be associated with decreased risk of dementia. It is unclear whether this relationship is similar or different between younger adults and older adults. OBJECTIVES: We examined for associations between midlife and late-life intake of flavonoid-rich fruits and incident dementia. We hypothesized that greater total cumulative intake of flavonoid-rich fruits in midlife and late-life adults would be associated with reduced risk of all-cause dementia. DESIGN: Longitudinal, cohort study design. SETTING: Framingham Heart Study, which is a longitudinal, multi-generational community-based cohort based in Framingham, Massachusetts, USA. PARTICIPANTS: Participants from the Framingham Heart Study Offspring cohort were included (n = 2,790) who attended the fifth core exam between 1991 to 1995, and were dementia-free and at least 45 years of age at that time, as well as had valid food frequency questionnaires from the fifth to ninth core exams. MEASUREMENTS: Consumption of fruits with high flavonoid content or are important contributors to overall flavonoid intake was collected via food frequency questionnaire. Flavonoid-rich fruits from the food frequency questionnaire included raisins or grapes, prunes, bananas, fresh apples or pears, apple juice or cider, oranges, orange juice, grapefruit, grapefruit juice, strawberries, blueberries, and peaches, apricots, or plums. Dementia ascertainment was based on a multidisciplinary consensus committee, and included all-cause dementia and Alzheimer's disease dementia diagnoses based on research criteria. Cox models were used to examine associations between cumulative fruit intake and incident dementia, stratified by midlife (45-59 years; n = 1,642) and late-life (60-82 years; n = 1,148). RESULTS: Greater cumulative total fruit intake in midlife, but not late-life, was significantly associated with a 44% decreased risk of all-cause dementia (HR = 0.56; 95% CI = 0.32 – 0.98; p = 0.044). Decreased risk of all-cause dementia was also associated with higher intake of apples or pears in midlife and late-life, as well as higher intake of raisins or grapes in midlife only, and higher intake of oranges, grapefruit, blueberries, and peaches, apricots, or plums in late-life only. CONCLUSIONS: Among participants from the Framingham Heart Study, greater overall consumption of flavonoid-rich fruits in midlife was associated with reduced risk of dementia, though intake of specific fruits in midlife and late-life may have a protective role against developing dementia. These findings may help to inform future recommendations on when dietary interventions may be most beneficial to healthy brain aging across the life course.

PsyPost

Study links certain fatty acids in blood to decreased Alzheimer's risk

by Eric W. Dolan — January 6, 2024 in Alzheimer's Disease



(Photo credit: OpenAI's DALL·E)

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Volume 79, Issue 1
January 2024

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JOURNAL ARTICLE

Associations Between Blood Nutritional Biomarkers and Cerebral Amyloid-β: Insights From the COGFRAIL Cohort Study

Get access >

Natasha A Grande de França, PhD ✉, Gustavo Díaz, MSc, Laetitia Lengelé, PhD, Gaëlle Soriano, PhD, Sylvie Caspar-Bauguil, PhD, Laure Saint-Aubert, PhD, Pierre Payoux, MD, PhD, Laure Rouch, PhD, Bruno Vellas, MD, PhD, Philipe de Souto Barreto, PhD ... Show more

The Journals of Gerontology: Series A, Volume 79, Issue 1, January 2024, glad248, https://doi.org/10.1093/gerona/glad248

Published: 25 October 2023 **Article history** ▾

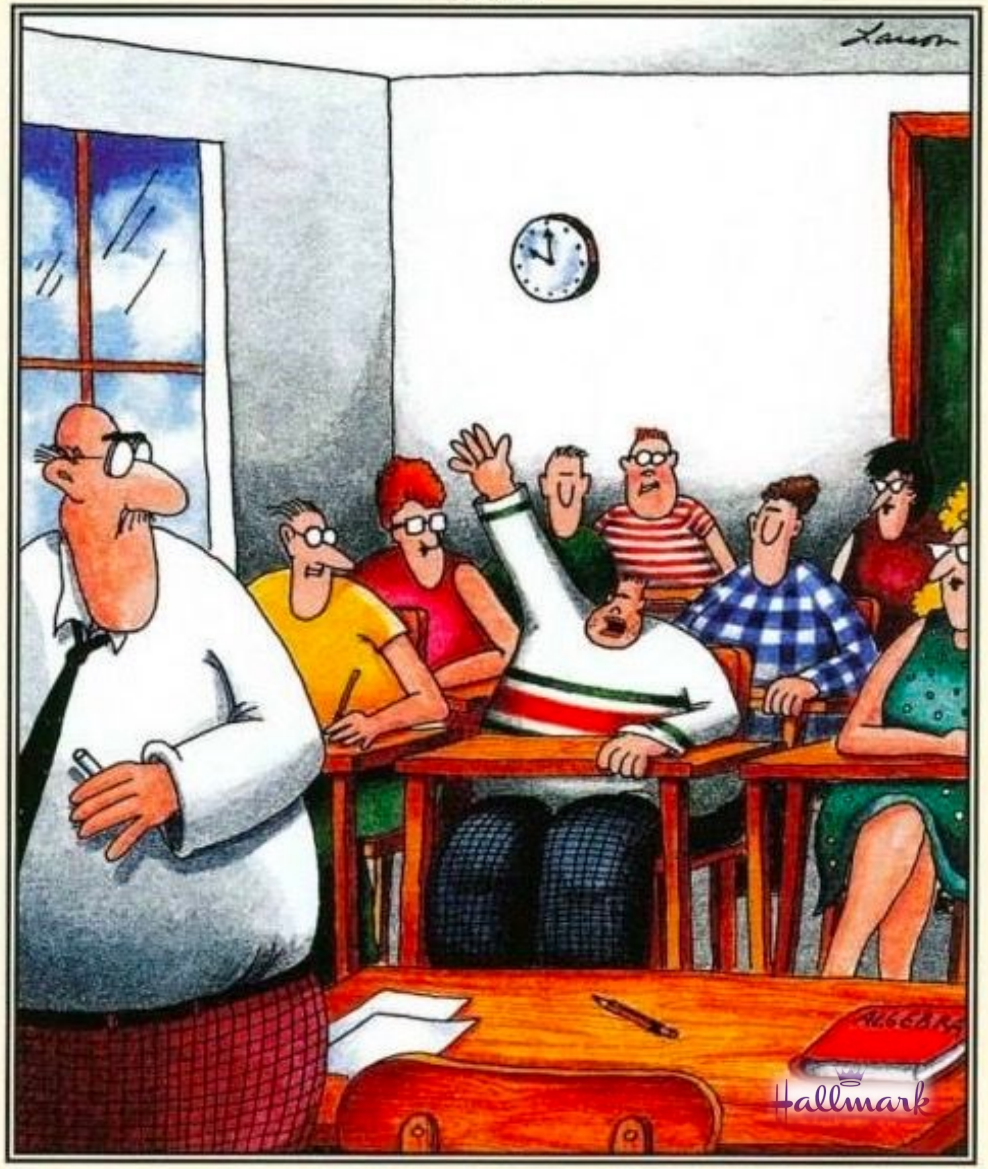
Abstract

Understanding the relationship between blood nutrients and neurodegeneration could contribute to devising strategies for preventing Alzheimer's disease. We investigated the associations between fatty acids, vitamins D, B6, B12, folate, homocysteine, and the cerebral load of amyloid β (Aβ). This cross-sectional study included 177 older adults (70–96 years, 65% female) with objective cognitive impairment, prefrail, or frail. Cerebral Aβ load was determined using positron emission tomography Standardized Uptake

Fatty Acids?

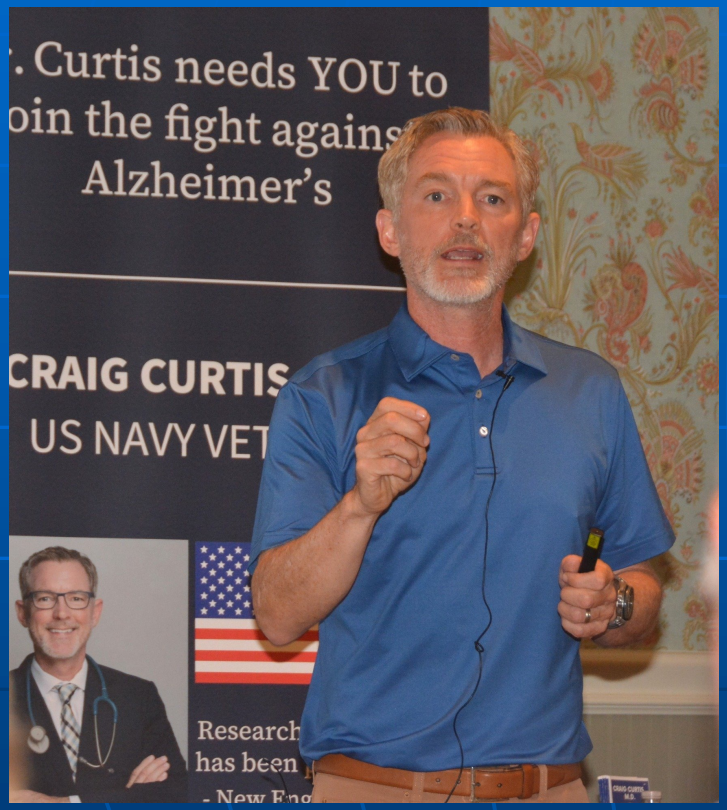
- 177 Patients Amyloid PET Positive
- Measured Various Nutrients: Vitamins, Amino Acids, Fatty Acids (Omega 3, Omega 6)
- Statistically significant finding of Omega 3 EPA (metabolite) = less Amyloid!!

9/8/86



"Mr. Osborne, may I be excused? My brain is full."

CraigCurtisMD.com



- THANK YOU
- Sharon Morse Bldg
- (352) 500-5252

Are you a member of a club?

- If you are a member of a club and would like Dr. Curtis to speak please don’t hesitate to talk to him!!

Dean Ornish MD supplement

Memory Supplements

health.harvard.edu/mind-and-mood/dont-buy-into-brain-health-supplements

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RECENT BLOG ARTICLES

- Chronic stomach pain in children: What's the most common cause?
- Monitoring blood pressure at home? Make sure you follow these steps
- Heat rash: How to spot it and what to do
- Leprosy in Florida: How worried should we be?

MIND & MOOD

Don't buy into brain health supplements

August 8, 2023

Forget about those over-the-counter products that promise better memory.

A recent survey found that about 25% of adults over age 50 take a supplement to improve their brain health with the promise of enhanced memory and sharper attention and focus.

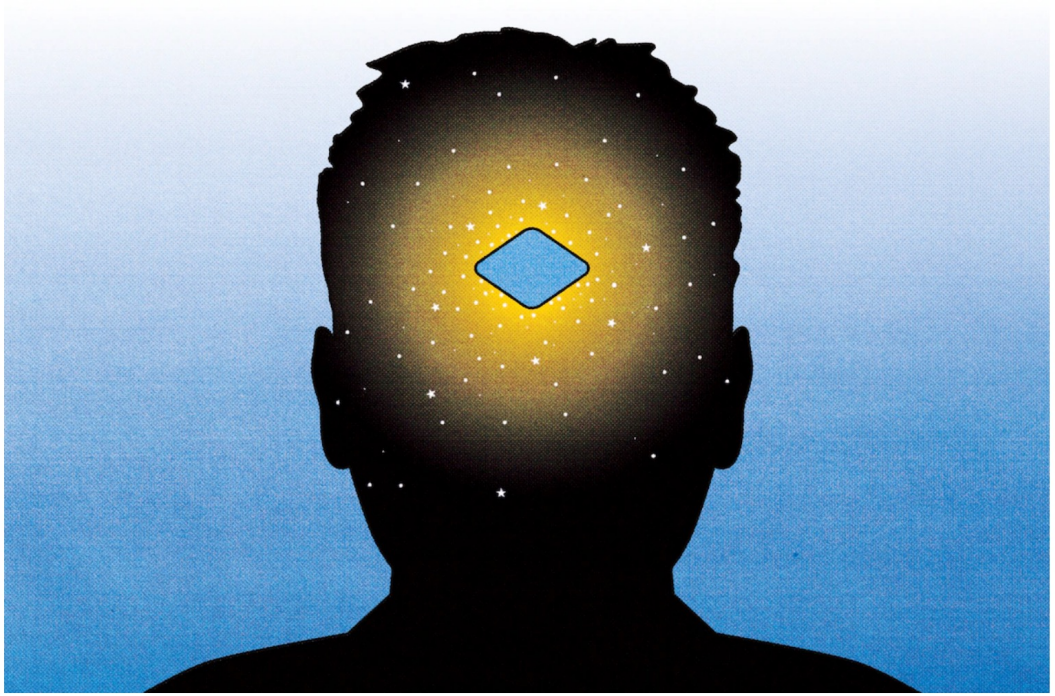
The Washington Post
Democracy Dies in Darkness

BRAIN MATTERS

Why Viagra has been linked with better brain health

By Teddy Amenabar

February 22, 2024 at 8:20 a.m. EST



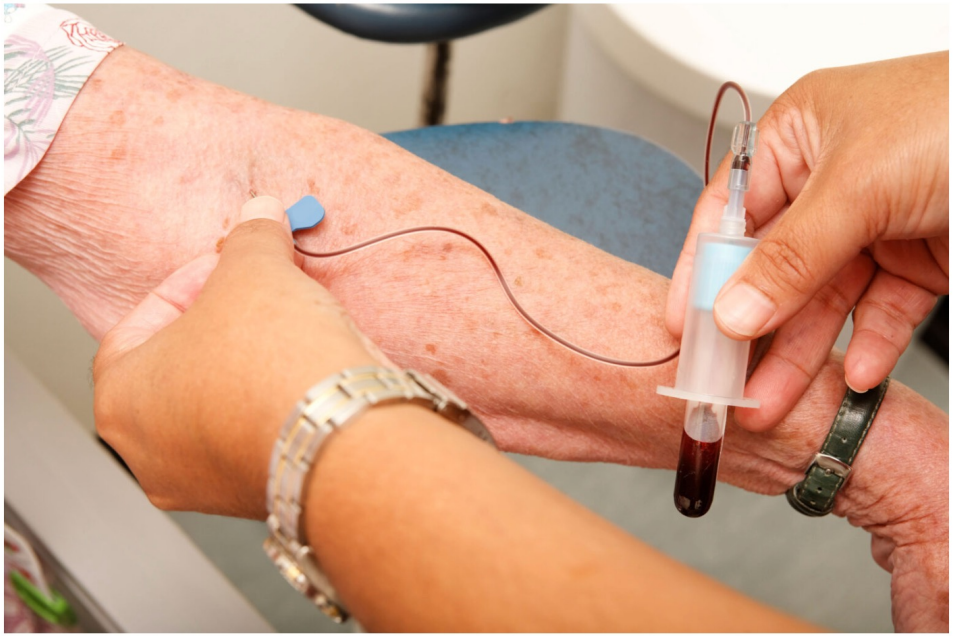
(George Wylesol for The Washington Post)

NEWS RELEASE

Alzheimer's blood test performs as well as FDA-approved spinal fluid tests

Could make early Alzheimer's diagnosis, treatment accessible to more people

by **Tamara Schneider** • February 21, 2024



Missed diagnosis: The hidden crisis of mild cognitive impairment in America

Two new USC Dornsife studies suggest that of the 8 million Americans who have MCI, more than 90% don't know it — an especially worrisome finding since early diagnosis is key to delaying onset of dementia and Alzheimer's disease.

By **Katharine Gammon** December 12, 2023

After moving back to Oceanside, Calif., Jean Bland looked forward to reconnecting with the familiar streets of her youth. But not long after settling in, her husband Mike noticed that Jean, with whom he'd shared 41 years of marriage, would occasionally find herself lost in the very places she once knew so well. Initially concerned, he dismissed it as a common sign of aging.

Jean, 79, a former nurse known for her meticulous nature and attention to detail, always came prepared to her doctor's appointments, armed with a litany of questions and notes. So, when she walked into the exam room two years ago without any list and displayed signs of forgetfulness, it raised eyebrows. Her physician, sensing something wasn't right, recommended a series of tests

Spying on α-Synuclein Inclusions: PET Tracers Inch Closer to Success

04 Aug 2023

PET tracers that illuminate α-synuclein in the brain have been hard to come by, but scientists may be getting closer. According to a study published August 3 in Cell, an 18F- tracer developed at Emory University, Atlanta, binds to α-synuclein aggregates in human Parkinson's disease brain samples, in mouse models of synucleinopathy, and in nonhuman primates. Crucially, it does so while shunning Aβ plaques or tau tangles, which commonly co-occur with Lewy bodies. Led by **Keqiang Ye**, now at the Chinese Academy of Sciences in Shenzhen, the study used cryo-electron microscopy to unveil the structural details of the tracer's specific liaison with α-synuclein. 18F-F0502B joins a growing field of candidate tracers, including three presented at the Alzheimer's Association International Conference, held July 16-20 in Amsterdam. One, made by AC Immune, binds to α-synuclein aggregates when they are highly concentrated in the brain, including in people with multiple system atrophy and in a genetic form of PD. The company's other up-and-coming tracer candidate holds promise in latching onto the smaller inclusions that predominant in the PD brain. Another, made by Merck, bound synuclein in mouse models of PD.

- New PET tracer binds α-synuclein aggregates in mice and nonhuman primates.
- Cryo-EM shows it nestles in groove along the fibrils.
- AC Immune and Merck report new candidates at AAIC.

"We are on the cusp of having a selective α-synuclein PET tracer that performs well in Parkinson's disease," said **Jamie Eberling** of the Michael J. Fox Foundation, which contributes funding for several ongoing efforts to develop the tracers, including AC Immune and Merck's.

A PET ligand for α-synuclein would help immensely with diagnosis and prognosis of synucleinopathies, and with recruitment and monitoring in clinical trials. Yet, suitable tracers have eluded the field for years, due to their subpar affinity for α-synuclein within the brain, as well as off-target binding to other types of aggregates, including Aβ plaques and neurofibrillary tangles. Making matters worse, α-synuclein deposits in the brain can be dwarfed by other protein inclusions. In a landmark for the field last year, AC Immune's 18F-ACI-12589 detected α-synuclein aggregates in people with multiple system atrophy, but failed to label inclusions in people with other synucleinopathies, including PD (Mar 2022 conference news).

In their hunt, co-first authors **Jie Xiang, Youqi Tao**, and **Yiyuan Xia** and colleagues took hints from compounds known to bind and block α-synuclein oligomerization, including molecules with catechol groups, such as dopamine and its derivatives. After screening an initial batch of 23 commercially available compounds for binding to preformed, recombinant α-synuclein fibrils, the

PRIMARY PAPERS

Xiang J, Tao Y, Xia Y, Luo S, Zhao Q, Li B, Zhang X, Sun Y, Xia W, Zhang M, Kang SS, Ahn EH, Liu X, Xie F, Guan Y, Yang JJ, Bu L, Wu S, Wang X, Cao X, Liu C, Zhang Z, Li D, Ye K. **Development of an α-synuclein positron emission tomography tracer for imaging synucleinopathies**. *Cell*. 2023 Aug 3;186(16):3350-3367.e19. Epub 2023 Jul 7 PubMed.

ANNOTATE

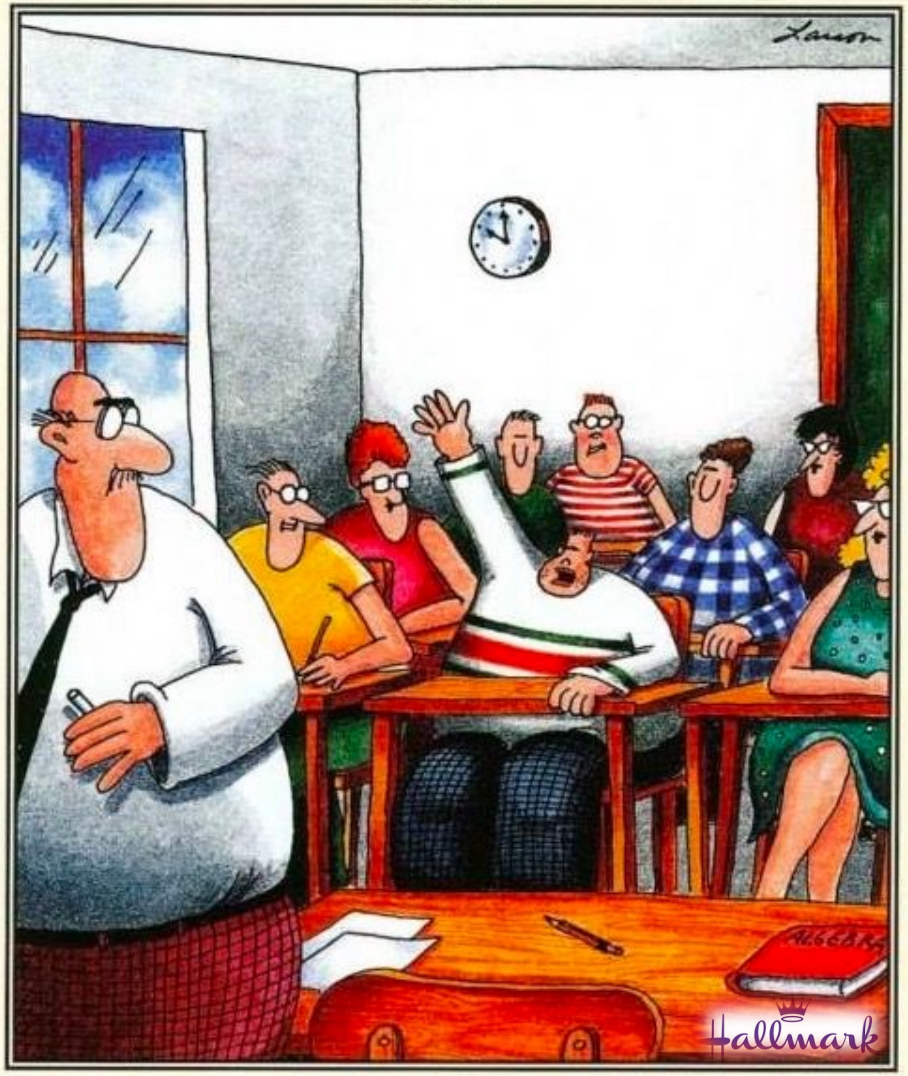
Brain Health Club

Colony Recreation Ctr. - 1st & 3rd Mon. At 1-2pm

TVBrainHealthClub@gmail.com

THE VILLAGES, FL

9/8/86



"Mr. Osborne, may I be excused? My brain is full."

Meet the Two New Biomarker Candidates for Lewy Body Diseases

21 Sep 2023

With several fluid biomarkers for Alzheimer's in hand, the search is on for counterparts in Parkinson's disease and dementia with Lewy bodies (DLB). Four new papers introduce two candidates: DOPA decarboxylase (DDC), the enzyme that converts levodopa into dopamine, and mitochondrial DNA damage.

- People with Lewy body disease (LBD) make ample DOPA decarboxylase (DDC).
- High DDC in CSF or blood distinguishes LBD from controls with up to 91 percent accuracy.
- DDC pegs preclinical LBD, foretells imminent symptom onset.
- Another marker, mitochondrial DNA damage, detected Parkinson's with 85 percent accuracy.

In the September 13 Nature Communications, researchers led by Charlotte Teunissen at Amsterdam University Medical Centers, The Netherlands, reported that high cerebrospinal fluid levels of DDC distinguished people with DLB from controls. Per Svenningsson, Karolinska Institutet, Stockholm, Sweden, found the same in PD, as reported in the September 4 Translational Neurodegeneration. So, too, did Oskar Hansson, Lund University, Sweden, in both DLB and PD. In the September 18 Nature Aging, his group also reported that DDC was up in blood from people with those diseases and that CSF DDC predicted progression within three years in people with preclinical DLB or PD.

Scientists led by Laurie Sanders, Duke University School of Medicine, Durham, North Carolina, measured mitochondrial DNA damage in blood cells. In the August 30 Science Translational Medicine, they reported that blood cells of people with PD and non-symptomatic carriers of a PD-causing mutation had more mitochondrial DNA damage than controls.

"A blood-based biomarker is critically needed for synucleinopathies as current modalities involve either procedures, e.g., lumbar puncture for CSF or skin biopsy, or expensive brain imaging," wrote

PRIMARY PAPERS

Pereira JB, Kumar A, Hall S, Palmqvist S, Stomrud E, Bali D, Parchi P, Mattsson-Carlgren N, Janelidze S, Hansson O. **DOPA decarboxylase is an emerging biomarker for Parkinsonian disorders including preclinical Lewy body disease**. *Nat Aging*. 2023 Sep 18; PubMed.

Paslawski W, Khosousi S, Hertz E, Markaki I, Boxer A, Svenningsson P. **Large-scale proximity extension assay reveals CSF midkine and DOPA decarboxylase as supportive diagnostic biomarkers for Parkinson's disease**. *Transl Neurodegener*. 2023 Sep 4;12(1):42. PubMed.

Del Campo M, Vermunt L, Peeters CF, Sieben A, Hok-A-Hin YS, Lleó A, Alcolea D, van Nee M, Engelborghs S, van Alphen JL, Arezoumandan S, Chen-Plotkin A, Irwin DJ, van der Flier WM, Lemstra AW, Teunissen CE. **CSF proteome profiling reveals biomarkers to discriminate dementia with Lewy bodies from Alzheimer's**

RESEARCH RESOURCE | NEURODEGENERATION

A blood-based marker of mitochondrial DNA damage in Parkinson's disease

RUI QI, ESTHER SAMMLER, CLAUDIA P. GONZALEZ-HUNT, IVANA BARRAZA, NICHOLAS PENA, JEREMY P. ROUANET, YAHAIRA NAALDIJK, STEVEN GOODSON, MARIE FUZZATI, [...], AND LAURIE H. SANDERS +19 authors Authors

Info & Affiliations

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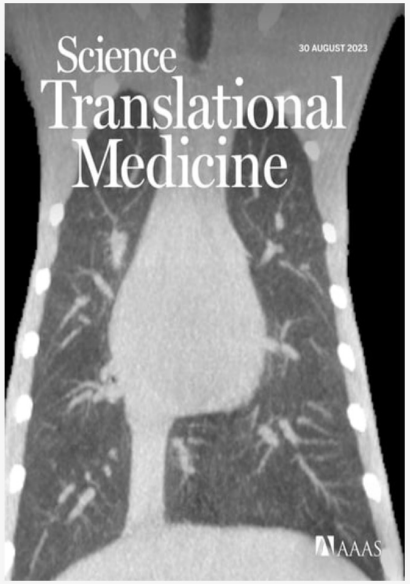
Editor's summary

Mitochondrial DNA damage has been implicated in Parkinson's disease. Here, Qi *et al*. developed a real-time PCR-based assay for mitochondrial DNA (mtDNA) lesions. Using this assay, the authors showed that inhibition or deletion of Leucine-rich repeat kinase 2 (LRRK2) can alleviate increased levels of mtDNA dam-

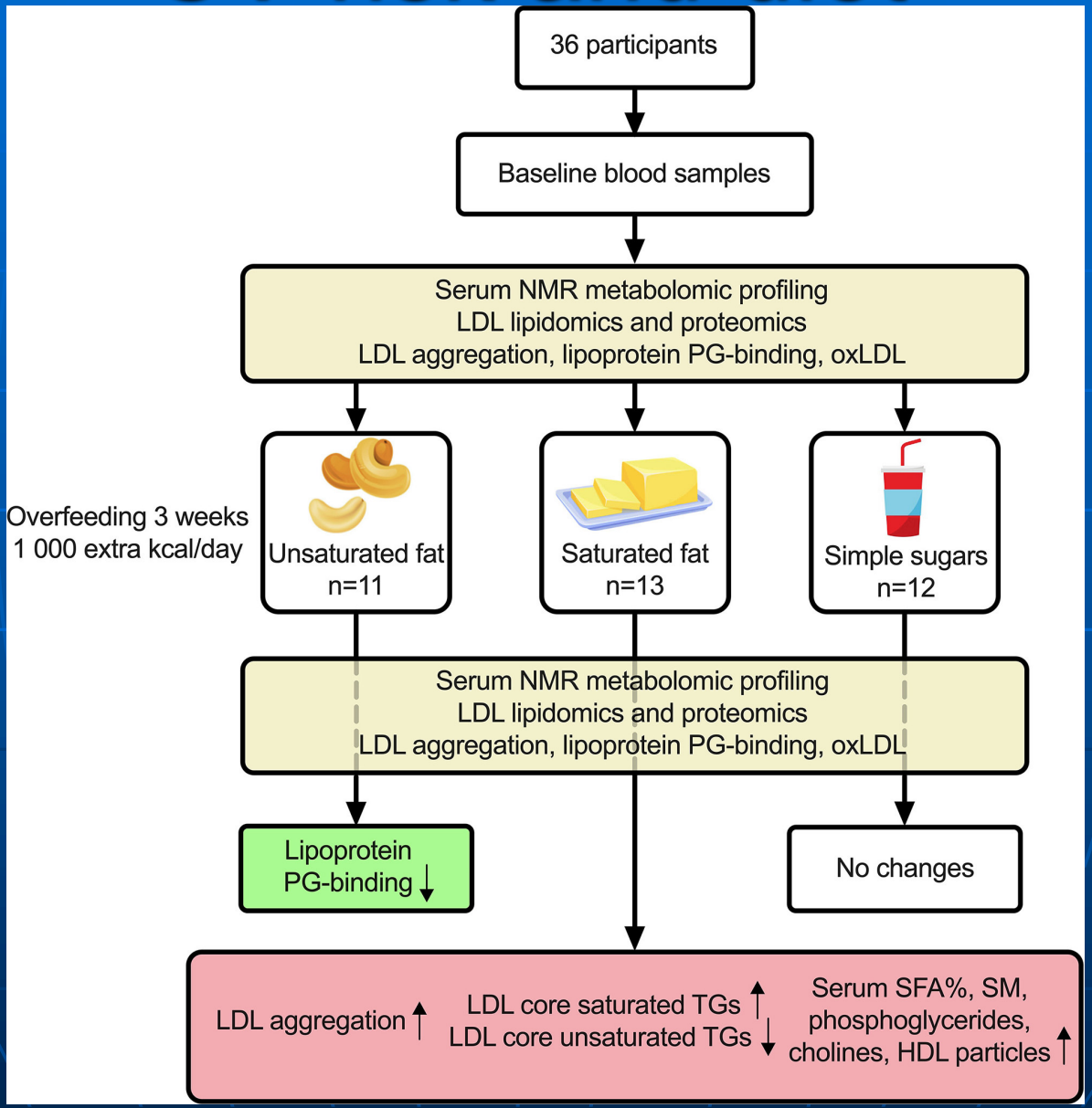
CURRENT ISSUE



Farnesol prevents aging-related muscle weakness in mice through enhanced farnesylation of Parkin-interacting substrate

BY JU-HYEON BAE, AREUM JO, ET AL.

CV risk and diet



Back to Basics: AD risk

- 1 in 20 age 65-74
- 1 in 8 age 75-84
- 1/3 of those 85 or older

ApoE 4 gene

- Who has it?
- What does it do?
- What are treatment implications?

- ApoE 4/4 risk of AD approx. 50%
- ApoE 4/4 AD onset approx. 71 yo

1992 - Amyloid Cascade Hypothesis

- Dr. John Hardy
  - Mayo Clinic chair Neuroscience Dept
  - NIH chief of Laboratory of Neurogenetics
  - St Mary's London

- Based on his and others (Tanzi (Harvard), Roses & Stritmatter (Duke) earlier discovery in 1980's of Amyloid gene mutation leading to early onset Alzheimer's Dementia

Modifiable and Non-modifiable Risk Factors (Cornell University Alz Prevention)

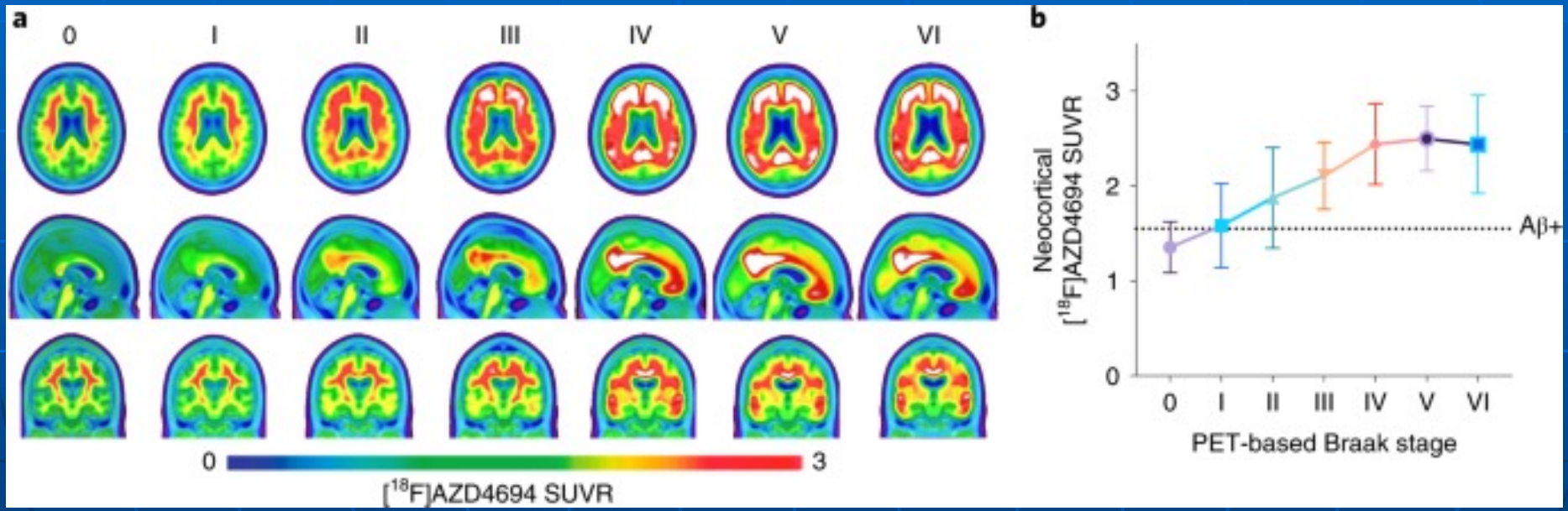
- Non-Modifiable
  - Age
  - Genetics
  - Gender
  - Family History
  - Past Medical Problems
- Modifiable
  - Diet
  - Physical Exercise
  - Brain Exercise
  - Slow Wave Sleep
  - Stress Reduction
  - BP/Cholesterol

Weil Cornell

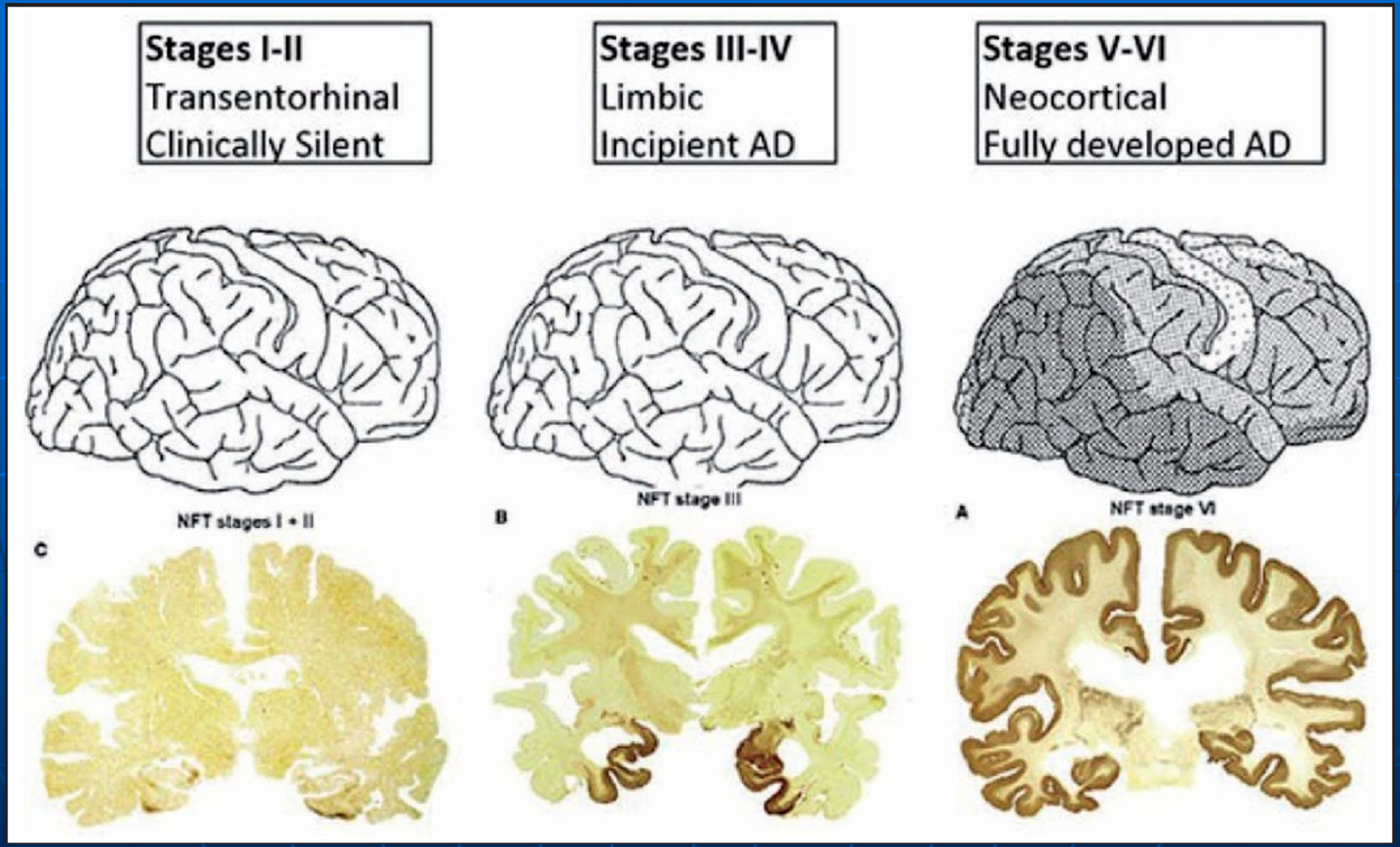
- "Research has shown that 40% of Alzheimer's cases may be preventable based on modifiable risk factors," Dr. Niotis says. Based on current scientific evidence, she suggests:
- Exercising at least three hours per week
- Eating a Mediterranean-style diet rich in green leafy vegetables, berries, and fatty fish like wild salmon, mackerel, and albacore tuna
- Reducing "bad" carbohydrates or "empty calories" like bread, pasta, rice, sweets
- Minimizing alcohol intake
- Getting adequate amounts of sleep
- Engaging in stress reduction techniques
- Protecting your head from injury
- Having your hearing checked and seeking appropriate management for hearing loss
- Staying socially engaged
- Learning new things, like language, dance, or a musical instrument
- Seeing your primary care doctor on a regular basis

Hearing Loss and Dementia

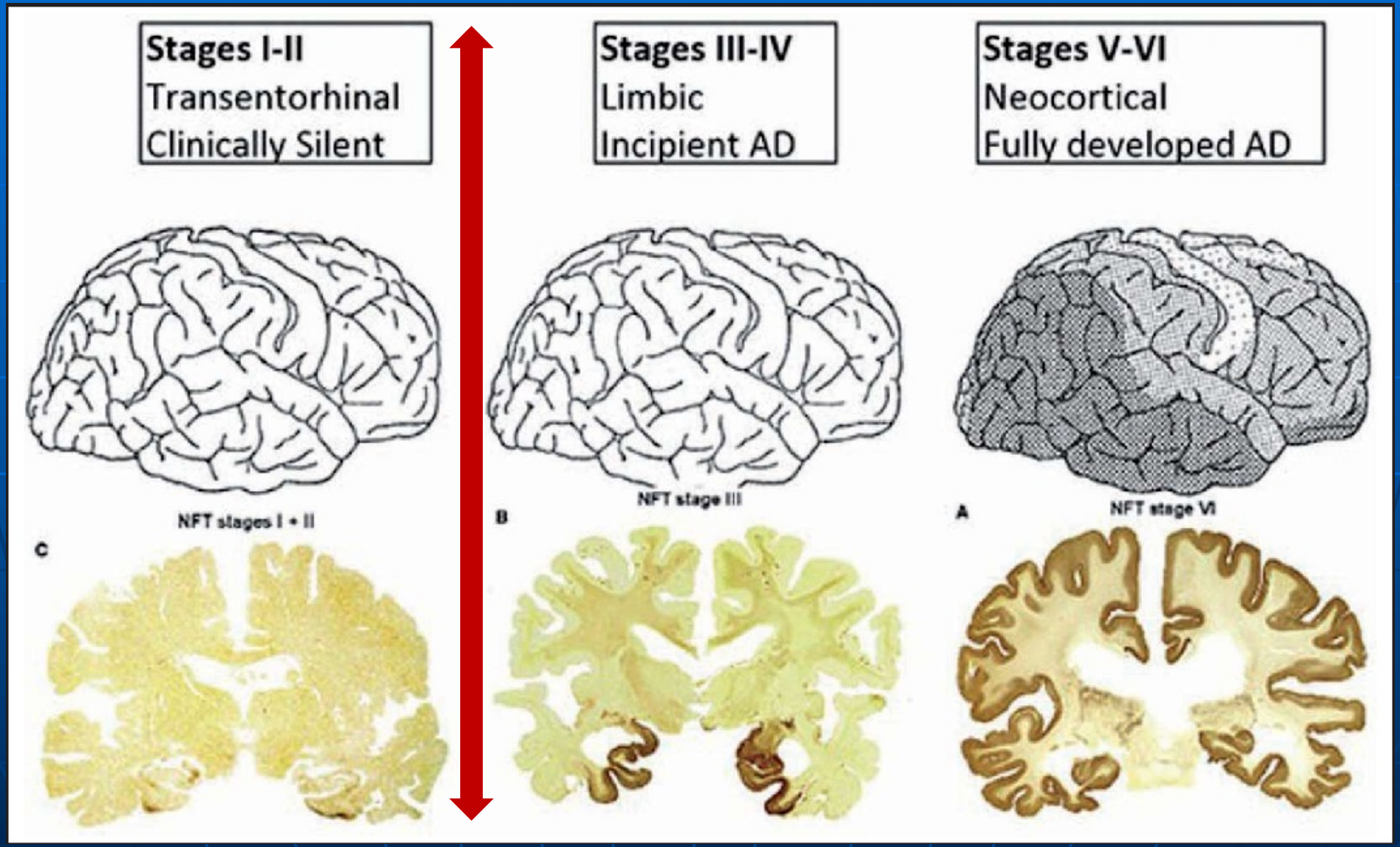
- 2011 Johns Hopkins study
  - Mild hearing loss = 2x risk
  - Moderate = 3x risk
  - Severe = 5x risk
- The exact connection between hearing loss and dementia remains a mystery
- Theories: Its possible that hearing loss deprives brain areas of stimulation leading to increased risk of dementia **OR** could be the reverse where dementia somehow affects the ability to hear


a
0
I
II
III
IV
V
VI
0
3
[18F]AZD4694 SUVR
b
Neocortical
[18F]AZD4694 SUVR
3
2
1
0
Aβ+
0
I
II
III
IV
V
VI
PET-based Braak stage

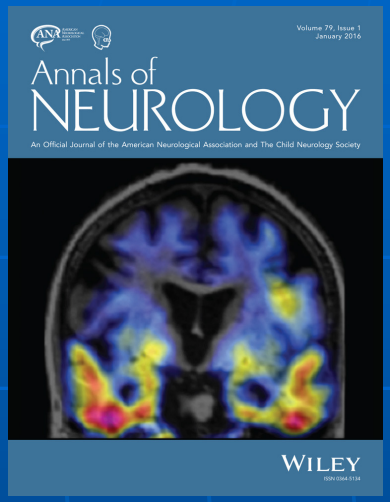
TAU progression = memory decline



TAU progression = memory decline



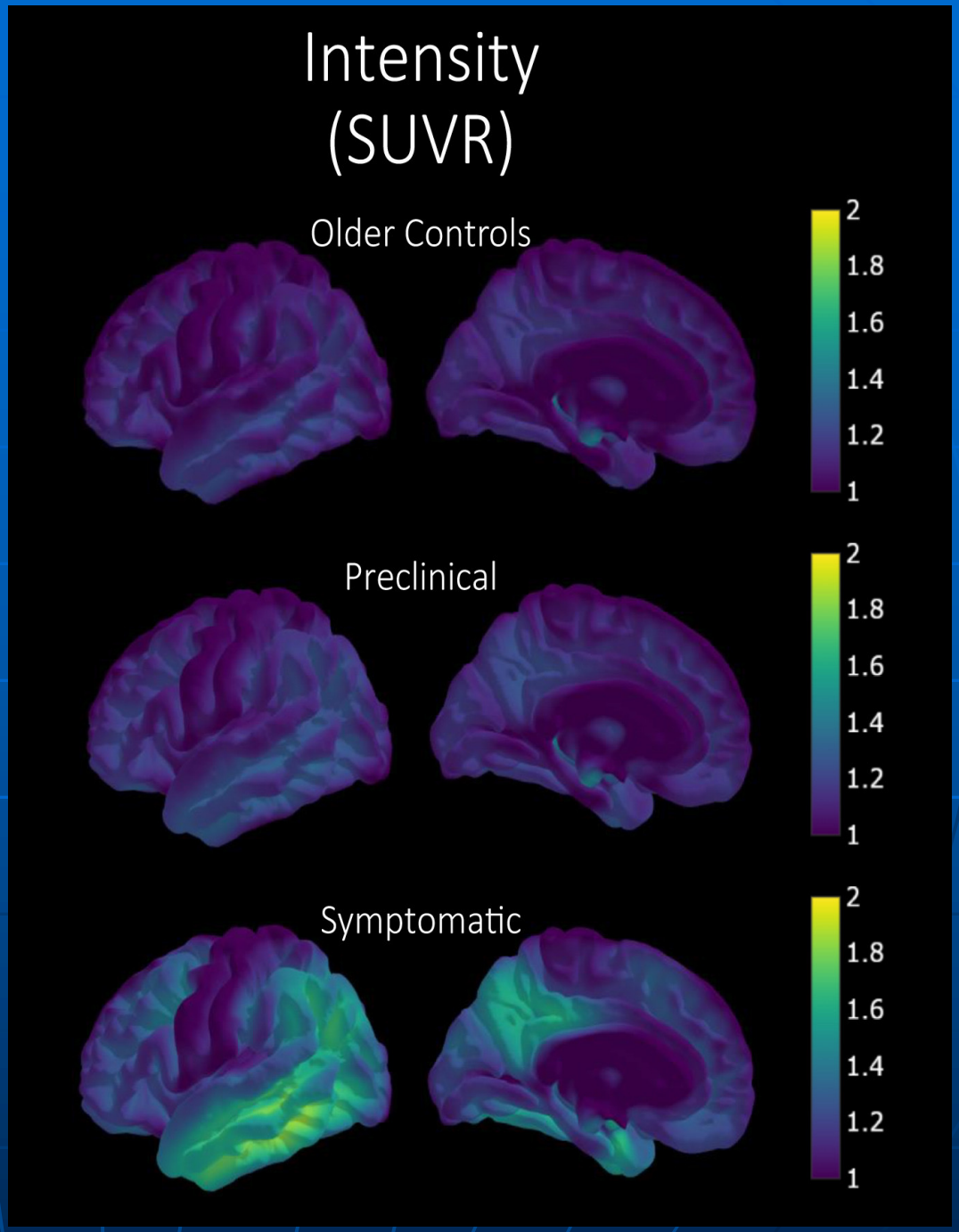
Tau progression PET scan



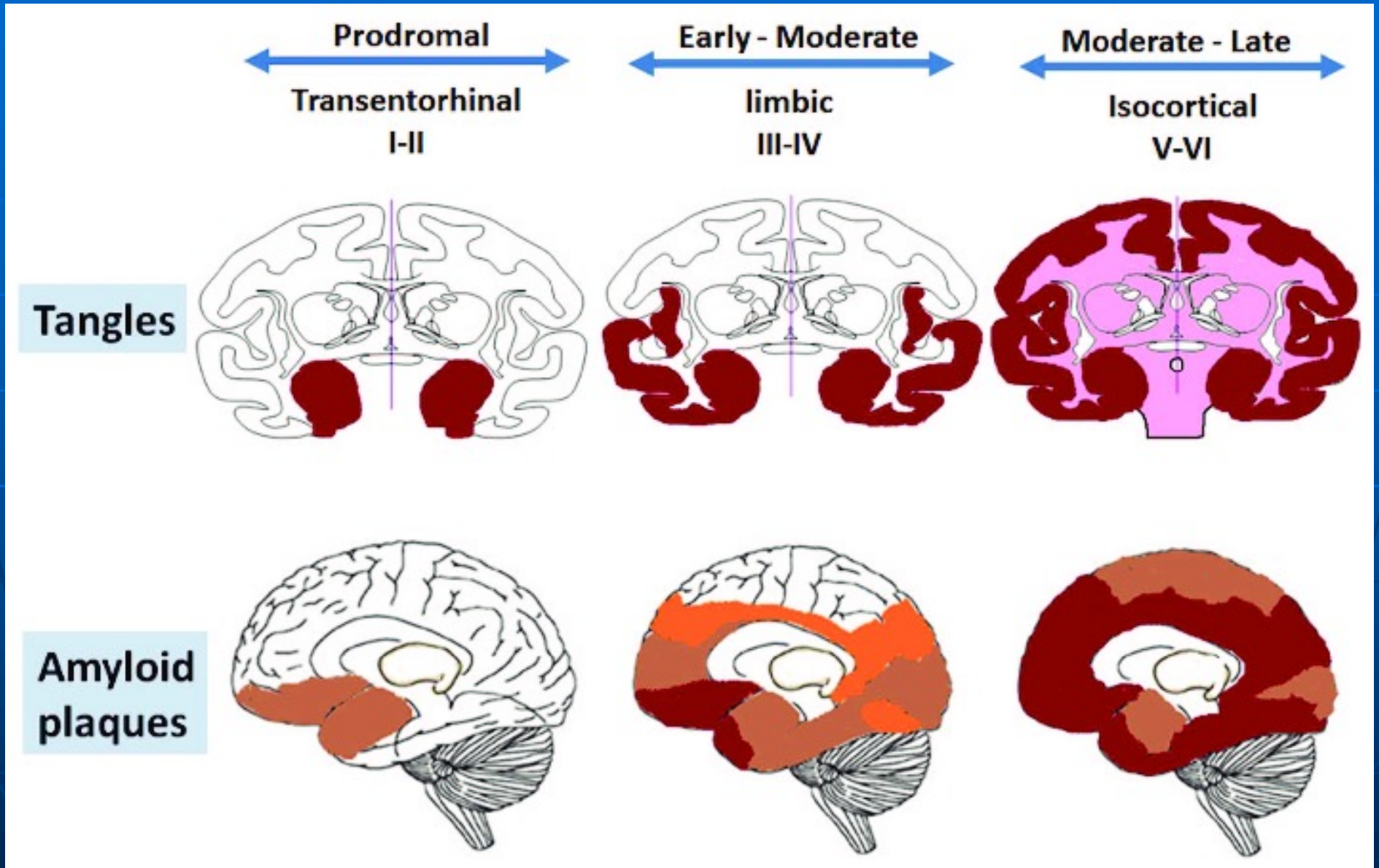
Jan 2016

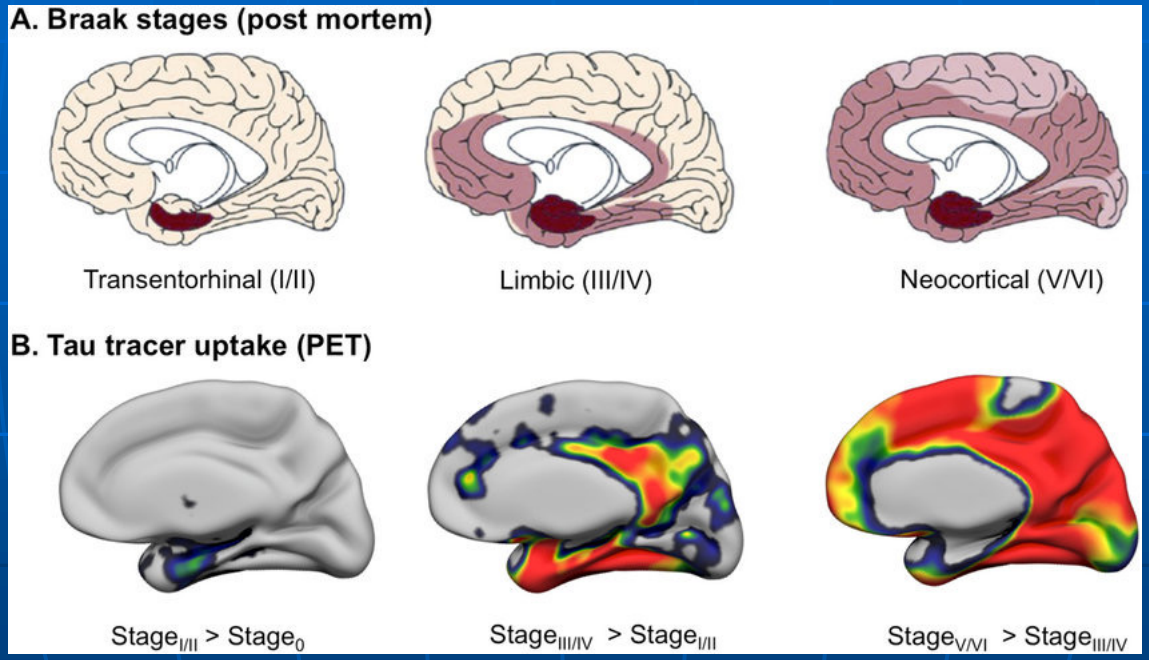
Harvard Medical School

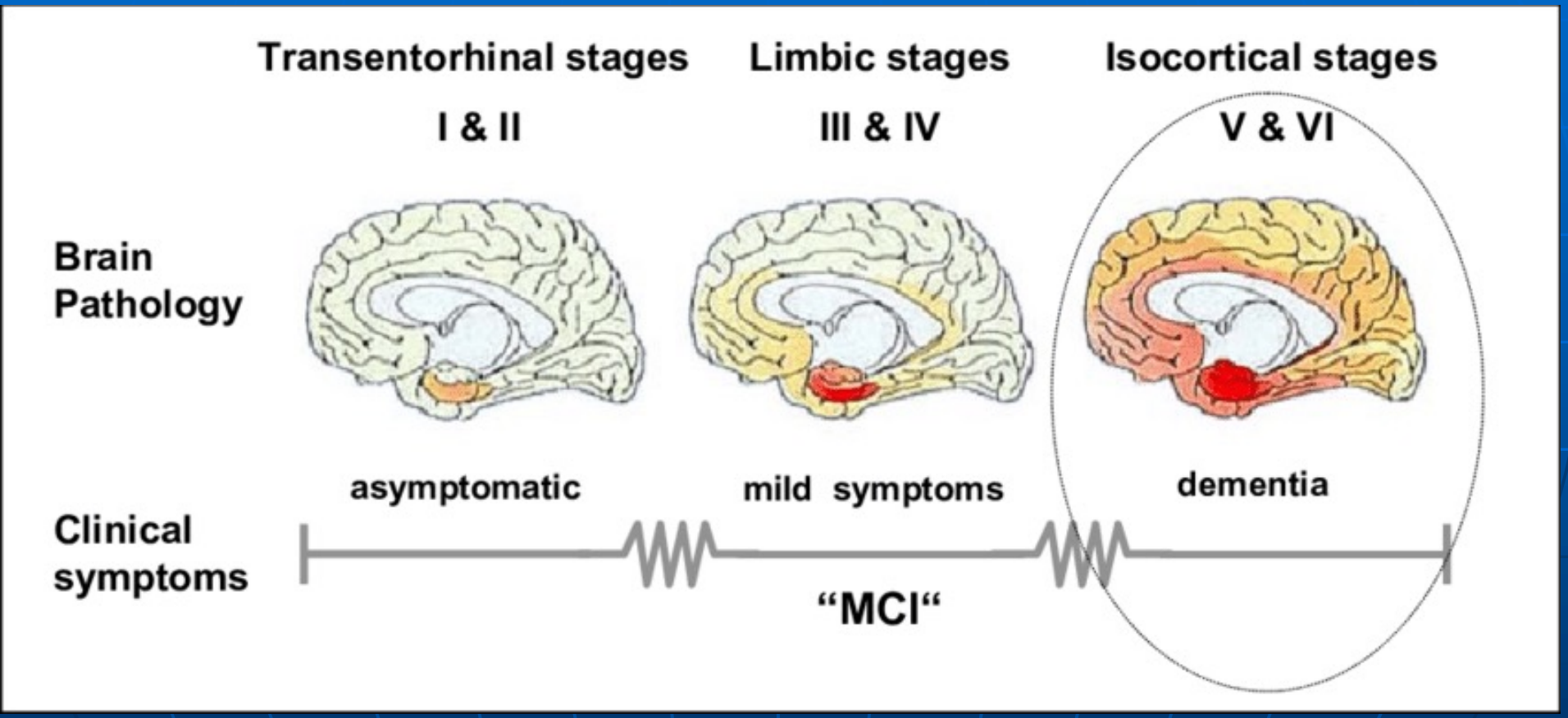
Keith Johnson, MD
Resia Sperling, MD



AMYLOID and TAU cascade




A. Braak stages (post mortem)
Transentorhinal (I/II)
Limbic (III/IV)
Neocortical (V/VI)
B. Tau tracer uptake (PET)
Stage$_{I/II}$ > Stage$_{0}$
Stage$_{III/IV}$ > Stage$_{I/II}$
Stage$_{V/VI}$ > Stage$_{III/IV}$


Transentorhinal stages
I & II
Limbic stages
III & IV
Isocortical stages
V & VI
Brain Pathology
asymptomatic
mild symptoms
dementia
Clinical symptoms
"MCI"

Thank you!

Craig Curtis, MD

K2 Summit Research
The Villages, FL

THE VILLAGES, FL