

Sleep and Brain Health



AZ Sleep Society Meeting
Saturday, September 26, 2026
9-10 am PT

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Medicine Phoenix
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(AAN)
Director, AASM Board of Directors, AASM Foundation
Board of Directors

BEFORE WE BEGIN...



REALITY...



Conflict of Interest Disclosures for Speakers

Joyce K. Lee-Iannotti, MD, FAAN, FAASM has no relevant financial relationships with ineligible companies to disclose.

Learning Objectives

- To provide an update on the growing body of evidence on the bidirectional relationships between sleep and brain health.
- To show how sleep can affect neurological disease state outcomes in DEMENTIA and COGNITION.
- Discuss evidence on what works and what doesn't in preserving brain health.

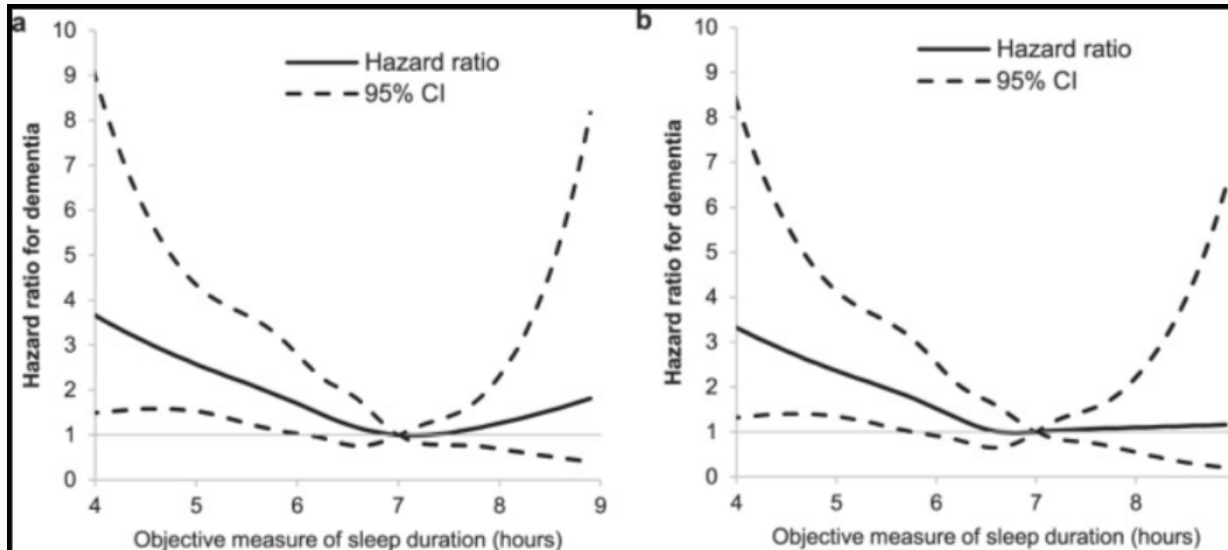
Sleep and Dementia Syndromes



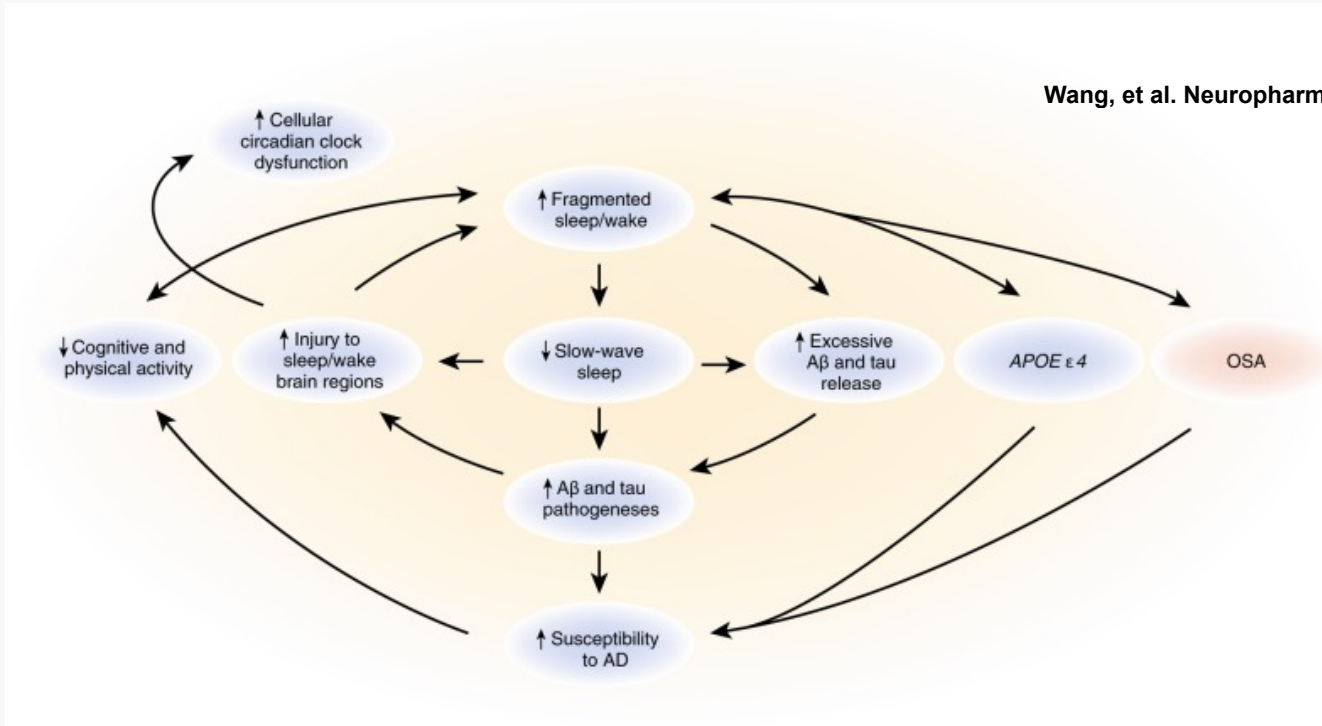
Sleep Duration Affects Risk of Dementia

- Whitehall II study, Sabia et al.
7959 participants, f/u 6.4 +/-1 year
Age 50-60 years
Average total Sleep Time
<6h vs >7h → 30% increased risk of dementia

Sabia, et al. Nat Commun. 2021;12(1) 2289.



Bidirectional Relationship of A β and tau and the Sleep Wake Cycle

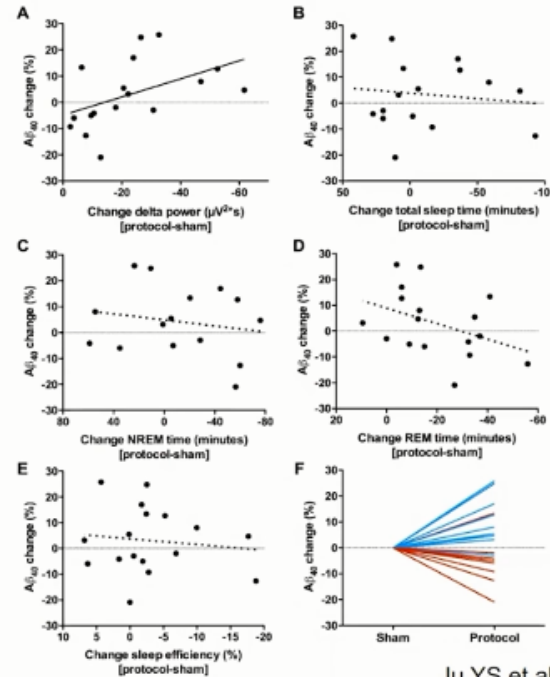


- Sleep dysfunction associated with accumulation of amyloid- β and tau proteins in both animal and human models.
- Abnormal sleep likely predates cognitive changes by 15-20 years, suggesting sleep disruption as a prodromal state.

Ju et al (2017)

- 17 healthy adults (age 35-65 years)
- 14-15 days of actigraphy, PSG with SWS disruption
- CSF collected for amyloid- β , tau, total protein, YKL-40, and hypocretin
- SWS disruption $\rightarrow$ increase in amyloid- β 40 ($r=0.610$, $p=0.009$) acutely and over several days (based on actigraphy data), increases tau.

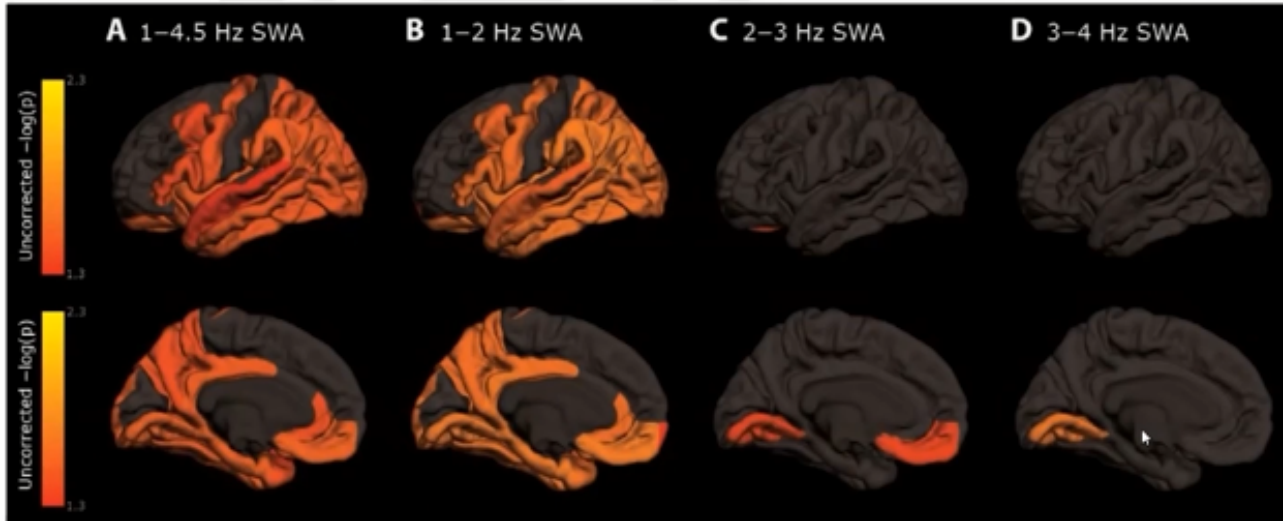
Decreased slow wave activity is associated with increased CSF A β



Yo-Ei Ju, MD

Ju YS et al. Brain, 2017. Aug 1;140(8):2104-2111.

Regional significant associations between tau deposition as measured by AV-1451 binding and slow wave activity



Brain imaging studies showed an increase in tau deposition inversely proportion to amounts of NREM SWA, most evident at the lowest frequencies of NREM SWA

Suvorexant Acutely Decreases Tau Phosphorylation and A β in the Human CNS

Brendan P. Lucey, MD, MSCI ^{1,2,3} Haiyan Liu, MD,¹ Cristina D. Toedebusch, BS,¹ David Freund,¹ Tiara Redrick, MS,¹ Samir L. Chahin, MS,^{1,2} Kwasi G. Mawuenyega, PhD,⁴ James G. Bollinger, PhD,^{1,2} Vitaliy Ovod, MS ^{1,2} Nicolas R. Barthélemy, PhD,^{1,2} and Randall J. Bateman, MD^{1,2}

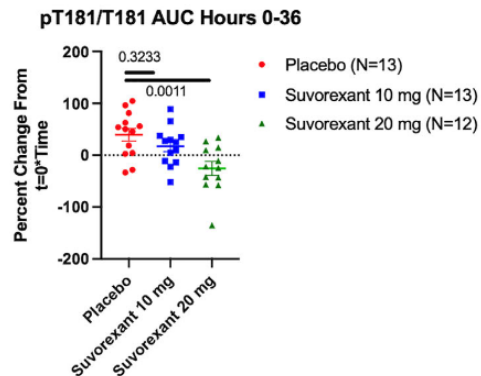
Objective: In Alzheimer's disease, hyperphosphorylated tau is associated with formation of insoluble paired helical filaments that aggregate as neurofibrillary tau tangles and are associated with neuronal loss and cognitive symptoms. Dual orexin receptor antagonists decrease soluble amyloid- β levels and amyloid plaques in mouse models overexpressing amyloid- β , but have not been reported to affect tau phosphorylation. In this randomized controlled trial, we tested the acute effect of suvorexant, a dual orexin receptor antagonist, on amyloid- β , tau, and phospho-tau.

Methods: Thirty-eight cognitively unimpaired participants aged 45 to 65 years were randomized to placebo (N = 13), suvorexant 10 mg (N = 13), and suvorexant 20 mg (N = 12). Six milliliters of cerebrospinal fluid were collected via an indwelling lumbar catheter every 2 hours for 36 hours starting at 20:00. Participants received placebo or suvorexant at 21:00. All samples were processed and measured for multiple forms of amyloid- β , tau, and phospho-tau via immunoprecipitation and liquid chromatography-mass spectrometry.

Results: The ratio of phosphorylated-tau-threonine-181 to unphosphorylated-tau-threonine-181, a measure of phosphorylation at this tau phosphosite, decreased ~10% to 15% in participants treated with suvorexant 20 mg compared to placebo. However, phosphorylation at tau-serine-202 and tau-threonine-217 were not decreased by suvorexant. Suvorexant decreased amyloid- β ~10% to 20% compared to placebo starting 5 hours after drug administration.

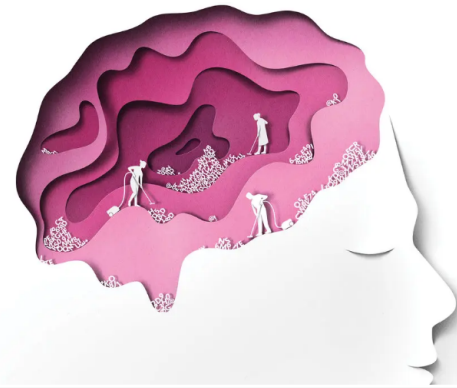
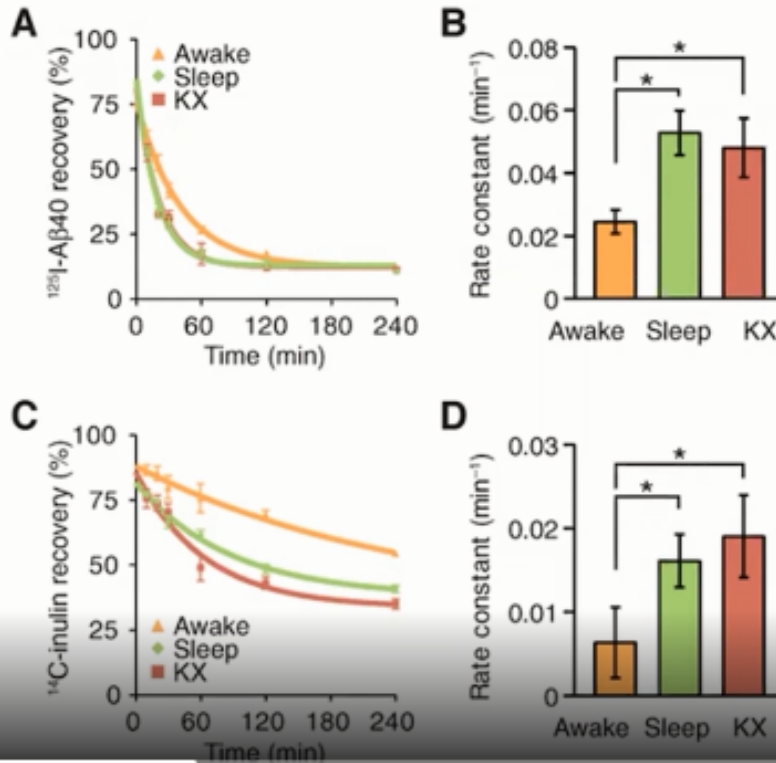
Interpretation: In this study, suvorexant acutely decreased tau phosphorylation and amyloid- β concentrations in the central nervous system. Suvorexant is approved by the US Food and Drug Administration to treatment insomnia and may have potential as a repurposed drug for the prevention of Alzheimer's disease, however, future studies with chronic treatment are needed.

ANN NEUROL 2023;94:27–40



Sleep drives metabolite clearance from the adult brain.

Xie L, Kang H, Xu Q, Chen MJ, Liao Y, Thiyagarajan M, O'Donnell J, Christensen DJ, Nicholson C, Iliff JJ, Takano T, Deane R, Nedergaard M. Science. 2013 Oct 18;342(6156):373-7. doi: 10.1126/science.1241224.



Sleep and anesthesia (using a tetramethylammonium diffusion) was associated with a 60% increase in β -amyloid clearance via increased exchange of CSF with interstitial fluid in live mice.

Report

Sleep Disturbance Forecasts β -Amyloid Accumulation across Subsequent Years

Joseph R. Winer,¹ Bryce A. Mander,² Samika Kumar,¹ Mark Reed,¹ Suzanne L. Baker,³ William J. Jagust,³ and Matthew P. Walker^{1,4,5,*}

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⁴Helen Wills Neuroscience Institute, University of California, Berkeley, 132 Barker Hall, Berkeley, CA 94720, USA

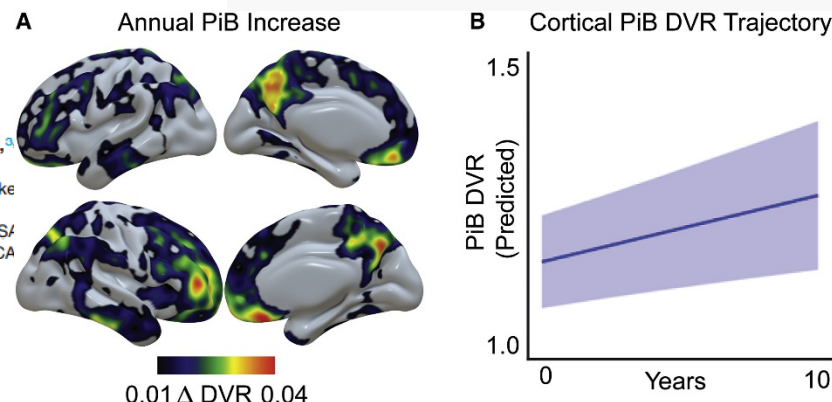
⁵Lead Contact

*Correspondence: mpwalker@berkeley.edu

<https://doi.org/10.1016/j.cub.2020.08.017>

SUMMARY

Experimental sleep-wake disruption in rodents and humans causally modulates β -amyloid ($A\beta$) dynamics (e.g., [1–3]). This leads to the hypothesis that, beyond cross-sectional associations, impaired sleep structure and physiology could represent prospective biomarkers of the speed with which $A\beta$ accumulates over time. Here, we test the hypothesis that initial baseline measures of non-rapid eye movement (NREM) sleep slow-wave activity (SWA) and sleep quality (efficiency) provide future forecasting sensitivity to the rate of $A\beta$ accumulation over subsequent years. A cohort of clinically normal older adults was assessed using objective sleep polysomnography in combination with longitudinal tracking of $A\beta$ accumulation with [11 C]PiB positron emission tomography (PET) imaging. Both the proportion of NREM SWA below 1 Hz and the measure of sleep efficiency predicted the speed (slope) of subsequent $A\beta$ deposition over time, and these associations remained robust when taking into account additional cofactors of interest (e.g., age, sex, sleep apnea). Moreover, these measures were specific, such that no other macro- and microphysiological architecture metrics of sleep demonstrated such sensitivity. Our data support the proposal that objective sleep markers could be part of a set of biomarkers that statistically forecast the longitudinal trajectory of cortical $A\beta$ deposition in the human brain. Sleep may therefore represent a potentially affordable, scalable, repeatable, and non-invasive tool for quantifying of $A\beta$ pathological progression, prior to cognitive symptoms of Alzheimer's disease (AD).

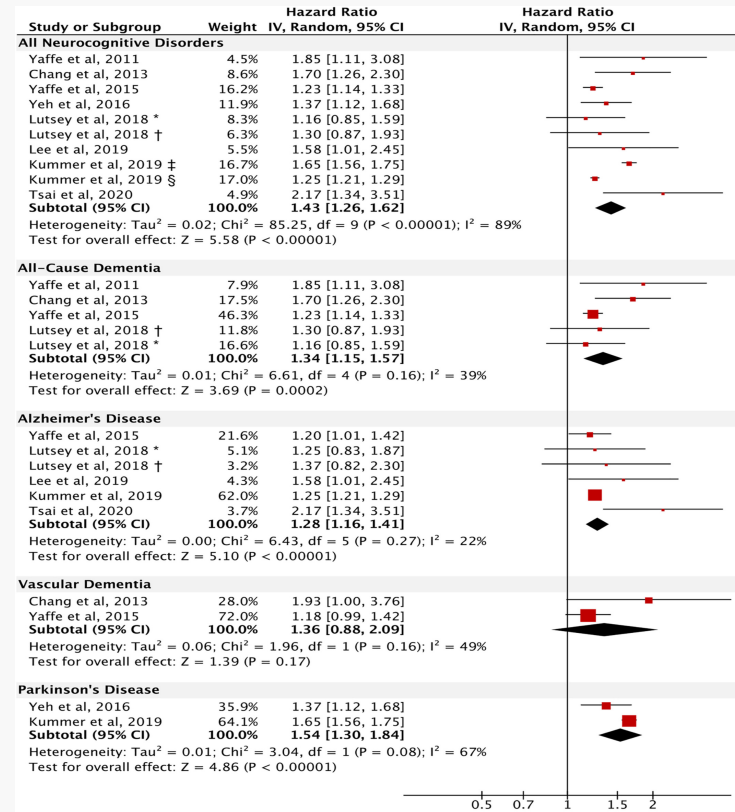


OSA and Risk of Dementia

Guay-Gagnon et al

OSA was associated with a significantly increased risk for dementia except for Vascular dementia

- **Alzheimer's Disease**
[HR 1.28, 95% CI, 1.16-1.41]
- **Parkinson's Disease with MCI**
[HR 1.54, 95% CI, 1.30-1.84]
- **Dementia with Lewy Body**
[HR 2.06, 95% CI, 1.45-2.91]



Footnotes

* AHI 15 to <30

† AHI ≥30

‡ Risk for Parkinson's Disease

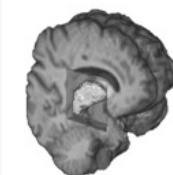
§ Risk for Alzheimer's Disease

Effect of CPAP therapy on MCI/AD incidence

- To examine associations between CPAP adherence and incident diagnoses of Alzheimer's disease (AD), mild cognitive impairment (MCI), and dementia not otherwise specified (DNOS) in older adults.
- Retrospective, 53,321 beneficiaries, aged 65 and older, with OSA diagnosis
- PAP treatment was associated with lower odds of incident diagnoses of AD and DNOS
 - OR= 0.78, 95% C: 0.69 to 0.89
 - OR = 0.69, 95% CI: 0.55 to 0.85
- Lower odds of MCI, approaching statistical significance, were also observed among PAP users
 - OR = 0.82, 95% CI: 0.66 to 1.02
- PAP treatment and adherence are independently associated with lower odds of incident AD diagnoses in older adults. Results suggest that treatment of OSA may reduce the risk of subsequent dementia.

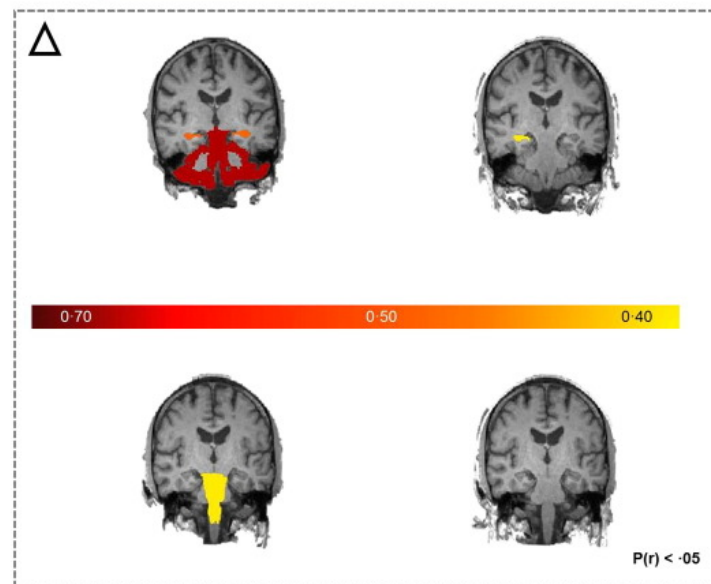
1 month of CPAP treatment vs BSC (Best Supportive Care)

- Improved verbal episodic memory
- Increased connectivity between the thalamus and hippocampus and cerebellar cortex
- Decreases in ESS correlated with changes in the BS



Right thalamus

ESS



Changes in Neurocognitive Architecture in Patients with Obstructive Sleep Apnea Treated with Continuous Positive Airway Pressure



Ivana Rosenzweig^{a,b,c,*}, Martin Glasser^{d,e,1}, William R. Crum^{a,h}, Matthew J. Kempton^{a,h}, Milan Milosevicⁱ, Alison McMillan^{d,e}, Guy D. Leschziner^{a,c,g}, Veena Kumari^f, Peter Goadsby^{g,h}, Anita K. Simonds^{d,e}, Steve C.R. Williams^{a,h}, Mary J. Morrell^{a,d,e}

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ⁱ Department for Environmental and Occupational Health, University of Zagreb, School of Medicine, Andrija Stampar School of Public Health, Zagreb, Croatia

ARTICLE INFO

ABSTRACT

CPAP

BSC

rm disorder that has a bidirectional relationship mentia. Treatment with Continuous Positive Air-
a, although it is still unclear which populations
are on different organ systems. We investigated
month into CPAP treatment in patients with OSA.
wly diagnosed moderate-severe OSA (Oxygen
core (ESS): 12.8 (4.9)) and 35 matched healthy
e testing, neuroimaging and polysomnography.
t supportive care (BSC), or BSC alone for one

end in the right thalamus [mean difference (%):
9, 95% CI: -4.34 to -0.24]. Significant improv-
ing treatment [mean difference (%): -27.97, 95%
correlated to neuroplastic changes in brainstem
ry scores [57.20, 95% CI: 42.94 to 71.46 vs 23.41,

iterations in the neurocognitive architecture that
mory in patients with OSA. We propose that par-
CPAP.

doi:10.1016/j.ebiom.2016.06.019

Case Presentation

69 yo RH M

PMH: HTN, HPL, intermittent bigeminy, PAC's

Established diagnosis of MCI due to Alzheimer's

Initial symptoms of "short term memory loss"

+ PET scan for amyloid

Donepezil 10 mg qhs

Enrolled into the aducanumab infusion study → stopped due to development of ARIA-H (despite clinical improvement)

First seen 11/2018 in Sleep Clinic for snoring, excessive daytime sleepiness (EDS) and disrupted sleep

Known history of OSA diagnosed 5 years ago

Using his CPAP only 50% of the time, discomfort

Exam

HT: 182 cm **WT:** 75.9 kg **BMI:** 22.91
NC 39 cm Friedman III

Apnea Hypopnea Index (AHI) of 27.3/hr, Medicare AHI of 18.5/hr, mostly hypopneas
 Oxygenation nadir 87%
 Optimal pressure of 10 cm H2O

How likely are you to doze off or fall asleep in the following situations? Which ones are likely to just make you drowsy? The following situations refer to our everyday way of. Even if you have not done any of these things recently, try to figure out how they would have affected you.

Use the following scale to choose the **MOST APPROPRIATE NUMBER** for each situation. Then, please **CIRCLE** the number that coincides with the situation.

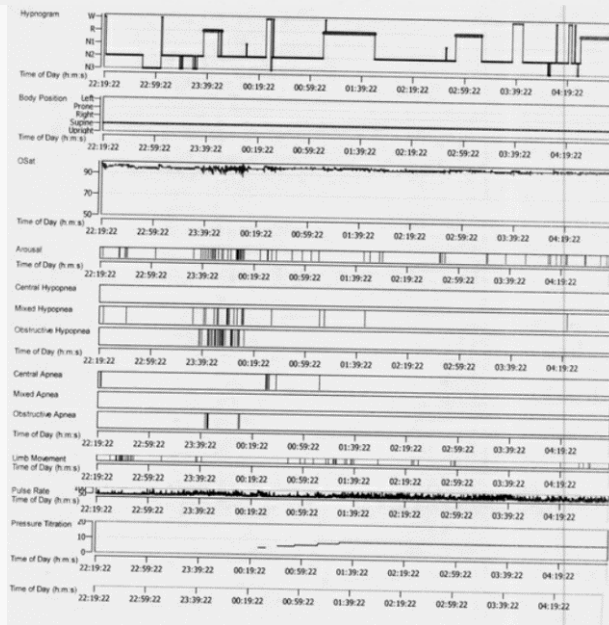
- 0 = Would *never* doze
 1 = *Slight* chance of dozing
 2 = *Moderate* chance of dozing
 3 = *High* chance of dozing

Situation	Chance of dozing
Sitting and reading	0 1 2 3
Watching TV	0 1 2 3
Sitting, inactive, in a public place (e.g., a theater or a meeting)	0 1 2 3
As a passenger in a car for an hour without a break	0 1 2 3
Lying down to rest in the afternoon when circumstances permit	0 1 2 3
Sitting and talking to someone	0 1 2 3
Sitting quietly after lunch without alcohol	0 1 2 3
In a car while stopped for a few minutes in traffic	0 1 2 3

Total Score:

9

	STAGE N1	STAGE N2	STAGE N3	STAGE REM	WAKE TIME	TST SUPINE
MINUTES	0.5	92.5	18.0	12.0	3.5	123.0
% OF TST	0.4%	75.2%	14.6%	9.8%	N/A	100%



Compliance Data

3 months post-initiation

Compliance Information

7/7/2019 - 8/5/2019

Compliance Summary

Date Range	7/7/2019 - 8/5/2019 (30 days)
Days with Device Usage	17 days
Days without Device Usage	13 days
Percent Days with Device Usage	56.7%
Cumulative Usage	2 days 18 hrs. 59 mins. 23 secs.
Maximum Usage (1 Day)	7 hrs. 13 mins. 15 secs.
Average Usage (All Days)	2 hrs. 13 mins. 58 secs.
Average Usage (Days Used)	3 hrs. 56 mins. 26 secs.
Minimum Usage (1 Day)	37 mins.
Percent of Days with Usage >= 4 Hours	26.7%
Percent of Days with Usage < 4 Hours	73.3%
Total Blower Time	2 days 19 hrs. 13 secs.

CPAP Summary

Average Time in Large Leak Per Day	3 mins. 42 secs.
Average AHI	1.4

Case Presentation (cont'd)

INSPIRE hypoglossal nerve stimulator

Prohibits some MRI imaging depending on model

Better QOL

MoCA 18 → 22/30



UTILIZATION SUMMARY (13 Oct 2021 12:00 to 11 Nov 2021 12:00 - 29 nights)

NIGHTS USED
29 of 29 (100%)

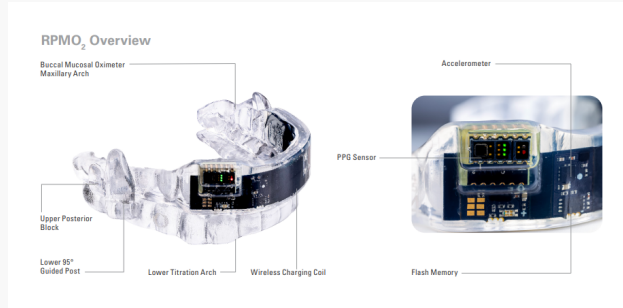
HOURS PER NIGHT USED
8.1 hours

THERAPY PAUSES
0.2 per night

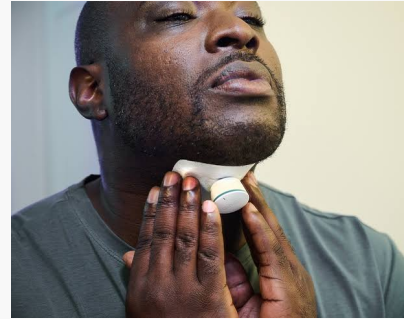
NIGHTS USED ≥ 4 HOURS
29 of 29 (100%)

NIGHTLY UTILIZATION (last 3 weeks)





Long term effects of non-CPAP alternative therapies?





Brain Health Supplements and Lifestyle Modifications – What Works and What Doesn't

Congress 2026

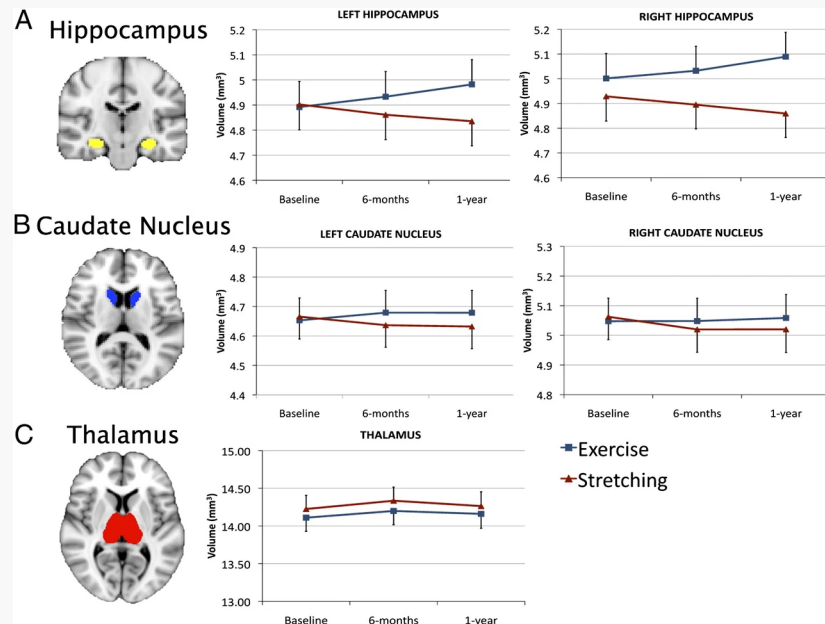




Exercise Works (Most Evidence)

Congress 2026

- Exercise is one of the most powerful non-pharmacologic interventions for healthy brain aging.
- Both aerobic and resistance training influence sleep quality, vascular health, metabolism, and cognitive resilience.
- Aerobic exercise can lead to positive brain MRI changes.
- Sleep and exercise reinforce one another.



Increase in hippocampus volume for the aerobic exercise group versus stretching group

Erickson KI, et al. *PNAS*. 2011;108:3017-3022.

Ahlskog JE, et al. *Mayo Clin Proc*. 2011;86:876-884.

Kredlow MA, et al. *J Behav Med*. 2015;38:427-449.

Falck RS, et al. *Br J Sports Med*. 2019;53:504-510.

Liu-Ambrose T, et al. *Arch Intern Med*. 2010;170:170-178. Chennaoui M, et al. *Sports Med*. 2015;45:161-186.

Voss MW, et al. *J Appl Physiol*. 2013;115:1505-1513.

Xue Y, et al. *Sleep Med Rev*. 2022;62:101595.



DIET Matters – Nutrients for Brain Health

Congress 2026

DAILY FLUID INTAKE GUIDANCE		
GENDER	AGE	AMOUNT OF FLUID FROM DRINKS AND FOOD (LITRES/DAY)
BOYS AND GIRLS	4-8 YEARS	1.6 LITRES 
GIRLS	9-13 YEARS	1.9 LITRES 
BOYS	9-13 YEARS	2.1 LITRES 
WOMEN	14+ YEARS	2 LITRES 
MEN	14+ YEARS	2.5 LITRES 

- Focus on fiber, plants, fish, antioxidants, and phytonutrients.
- Avoid ultra-processed foods and excess sugar.
- Hydration matters: water supports cognition and sleep quality.
- Eat your Greens
 - Leafy greens provide folate, vitamin K, antioxidants, and nitrates.
 - One serving daily has been associated with slower cognitive aging.
- Omega 3 Fatty Acids
 - Support cardiovascular and brain health.
 - Fish sources are preferred or supplements (1–2 g/day)

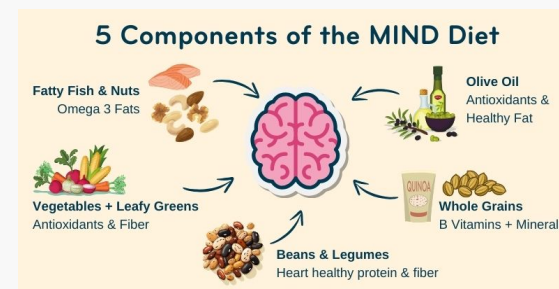
2 liters ÷ 1.18
liters = ~1.7
Stanley cups





Diet Matters – the MIND Diet

Congress 2026



- The **MIND diet** (“Mediterranean-DASH Intervention for Neurodegenerative Delay”) combines principles from the Mediterranean and DASH diets and was specifically designed to support cognitive health and healthy brain aging.

- It emphasizes foods rich in:

Antioxidants

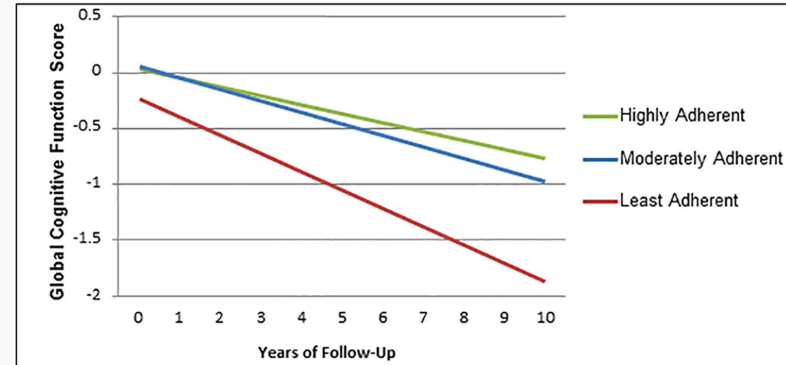
Polyphenols

Omega-3 fatty acids

Anti-inflammatory nutrients

- Limits:

Butter/margarine, fried foods, processed foods, red meat, pastries and sweets





Key Brain Healthy Foods

Congress 2026

- ✓ Berries: polyphenols and antioxidants
- ✓ Beans/lentils: protein and fiber
- ✓ Salmon: omega-3 fatty acids
- ✓ Pumpkin seeds: magnesium and fiber
- ✓ Olive oil: anti-inflammatory support

BRAIN-HEALTHY GROCERY LIST

Eat well. Support your brain and body.



BERRIES

Polyphenols
and antioxidants



BEANS/LENTILS

Protein and fiber



SALMON

Omega-3
fatty acids



PUMPKIN SEEDS

Magnesium
and fiber



OLIVE OIL

Anti-inflammatory
support

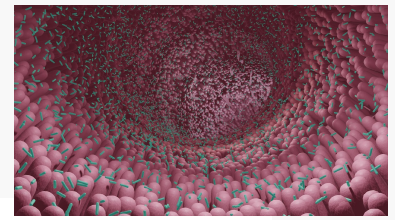




Gut Microbiome

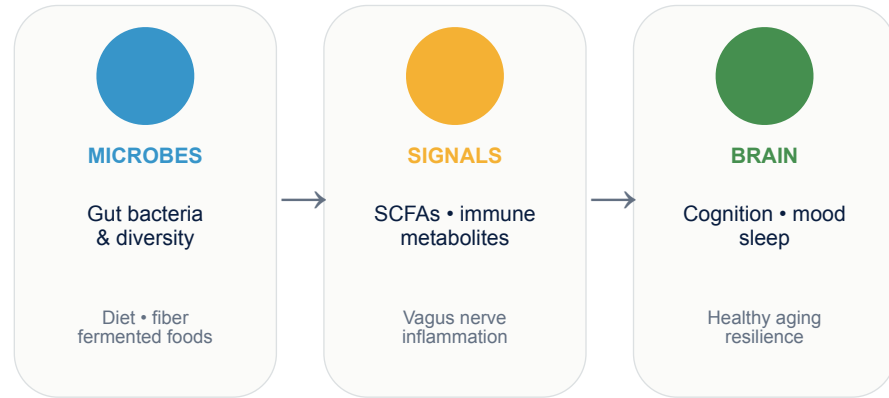
Brain Health 2026

- The gut–brain axis is bidirectional: microbial metabolites, immune signaling, and the vagus nerve connect gut and brain.
- Diversity matters more than a single “good” organism—diet is a major driver of microbial composition.
- Brain-health associations are promising but not yet proof of causation.
 - Dysbiosis has been linked with cognition, mood, and neurodegenerative disease.



THE GUT–BRAIN AXIS

How the microbiome may influence brain health



Practical tips:

- ✓ Fiber rich plants
- ✓ Fermented foods
- ✓ Probiotics
- ✓ Avoiding antibiotics unless necessary

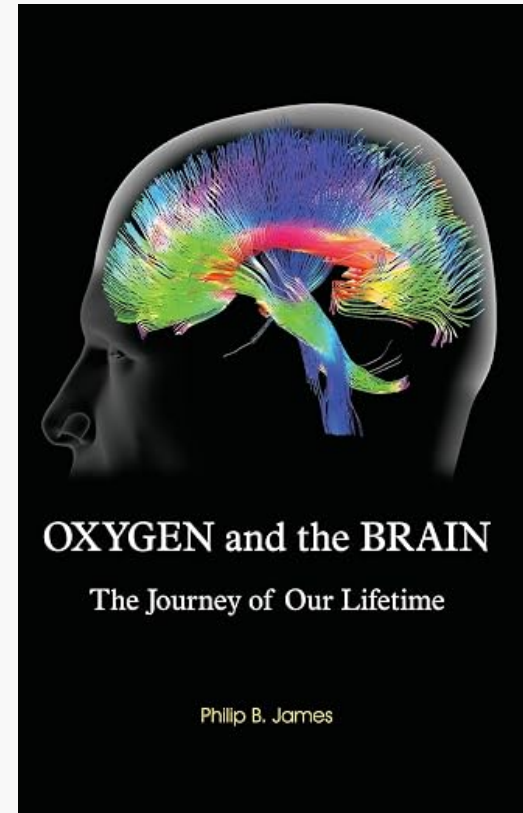




Women in Sleep
Congress 2026

Treating OSA Works

- OSA contributes to hypertension, stroke, atrial fibrillation, and cognitive dysfunction.
- Women often present atypically with fatigue, insomnia, and headaches.
- Treatment improves quality of life and cardiovascular risk.





Hormone Replacement Therapy (HRT/MRT)

Vancouver Congress 2026



- May improve vasomotor symptoms and sleep quality → improved cognition
 - Reducing nighttime awakenings, improving mood and anxiety symptoms, stabilizing circadian and thermoregulatory mechanisms
 - Strongest evidence in women with night sweats, vasomotor symptoms, and perimenopausal insomnia
- Potential vascular and cognitive implications depend on timing and patient selection.
 - Estrogen has biologic effects on:
 - Synaptic plasticity
 - Cerebral blood flow
 - Glucose metabolism
 - Neurotransmitter systems
 - Hippocampal function
- BUT RCT data is mixed, and HRT is not recommended for dementia prevention (NAMS Position Statement, 2022)
- Shared decision-making is essential.

The North American Menopause Society. *Menopause*. 2022;29:767-794.

Shifren JL, Gass MLS. *JAMA*. 2014;311:294-305.

Maki PM, et al. *Neurology*. 2011;76:S9-S17.

Brinton RD. *Dialogues Clin Neurosci*. 2009;11:311-321.

Kravitz HM, et al. *Sleep Med Clin*. 2018;13:443-456.

Henderson VW. *Climacteric*. 2014;17(suppl 2):29-35.

Saver JL, et al. *Stroke*. 2004;35:2644-2647.

WHI Memory Study. *JAMA*. 2003;289:2651-2662



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OTC Hodge Podge: Jury is Out

Congress 2026

- Melatonin
 - Strongest evidence in sleep regulation and circadian rhythm stabilization → improve sleep architecture and quality
 - Some hypothesis on Brain Health
 - Potent free-radical scavenger and may reduce oxidative stress in neurons and mitochondria
 - Modulates inflammatory signaling pathways that contribute to neurodegeneration and vascular aging
 - No high-quality human evidence proving melatonin extends lifespan or helps cognition directly
- Metformin
 - Improves peripheral insulin sensitivity and may improve cerebral glucose metabolism
 - Studies shows lower rates of dementia and cognitive decline but were mostly in DM2 patients
 - TAME Trial (Targeting Aging with Metformin) is recruiting with results pending
- Statins
 - Most evidence in prevention of vascular dementia/stroke

Dai J et al. J Alzheimers Dis Rep. 2022 Aug 3;6(1):443-459.



Olmastroni E, et al. Eur J Prev Cardiol. 2022 May 5;29(5):804-814.



VPeptides Sleep
Congress 2026



- Peptides (GLP-1's)
 - May improve metabolic and sleep health
 - EVOKE and EVOKE + Trials
 - Phase 3 RCTs, GLP-1 receptor agonist semaglutide (oral formulation, 14 mg) could slow cognitive decline in early Alzheimer's disease
 - ~3800 ppts (ages 55-85, MCI/mild AD, amyloid PET +)
 - 104-week primary treatment phase
 - Primary Endpoint: change in CDR-SB (Clinical Dementia Rating–Sum of Boxes)
 - Secondary Endpoint: functional outcomes, ADCS-ADL-MCI, biomarkers (MRI), safety/tolerability
 - Conclusion: did **not** show that semaglutide slowed Alzheimer's progression
 - Criticism: intervening too late, wrong biomarkers (no amyloid PET), too short of a trial period, wrong med (higher-dose injectable formulations)
 - Animal models in normal populations show promise in decreasing neuro-inflammation and slowing progression of cognitive decline
 - FDA approved for mod-severe OSA



Supplements p

Congress 2026

- Vitamin D, B12, iron, and folate should generally be replaced if deficient – check the labs!
- More is not always better.
- Evidence for longevity and role in brain health is controversial. Deficient states mostly linked to symptoms – fatigue, low energy, brain fog.

NORMAL BLOOD LEVELS

Vitamin D, B12, Iron, and Folate

 VITAMIN D		 VITAMIN B12		 IRON		 FOLATE	
Test	25-Hydroxy Vitamin D	Test	Vitamin B12	Test	Serum Iron	Test	Serum Folate
Normal Range	30–100 ng/mL	Normal Range	200–900 pg/mL	Normal Range	60–170 µg/dL	Normal Range	4.0–20.0 ng/mL
Optimal Range	40–60 ng/mL	Optimal Range	400–800 pg/mL	Optimal Range	70–150 µg/dL	Optimal Range	6.0–20.0 ng/mL
Insufficient (Below Normal)	20–29 ng/mL	Low (Below Normal)	< 200 pg/mL	Low (Below Normal)	< 60 µg/dL	Low (Below Normal)	< 4.0 ng/mL



Ranges may vary slightly between laboratories.
Always interpret results based on clinical context and symptoms.



Socialization and Avoidance of Loneliness

World Sleep Congress 2026



- Evidence linking social connection to brain health is actually quite strong and is one of the most consistent findings in aging and dementia research.
- **The Lancet Commission on Dementia Prevention**
 - One of the most influential reports in dementia prevention showed that social isolation is a modifiable dementia risk factor.
- Kuiper et al., 2015, Meta-Analysis of Social Isolation and Dementia Risk
 - Loneliness associated with approximately 40% increased dementia risk
 - Poor social networks associated with higher cognitive decline rates

Kuiper et al. Ageing Res Rev. 2015 Jul;22:39-57.



Sleep in the Blue Zone



The Opportunity

For over two decades, “**Blue Zones**” research has identified communities where people live longer, healthier lives due to shared environmental, lifestyle, and social factors—a **blue zone exposome**. Yet one essential pillar of longevity remains underexplored: **sleep**. Support for the **Barrow Sleep Zone Project** will enable a first-of-its-kind initiative to systematically study sleep and environment as modifiable drivers of healthy neurologic aging. Ultimately, this project aims to deliver evidence-based, **blue zone-inspired** sleep strategies to promote healthy aging for all people, everywhere. This initiative will generate the first real-world dataset linking the **exposome**, sleep quality, and healthy neurologic aging, with the potential to:

Reduce risk of stroke, dementia, and neurodegenerative disease



Improve cognitive performance and quality of life

Establish Barrow as a national leader in sleep-driven longevity science.



Create scalable programs for Arizona and beyond



The Science

This project moves beyond traditional sleep medicine by integrating **objective** measurement of the **blue zone-aligned exposome**, sleep quality, and healthy neurologic aging in a novel cohort from the Greater Phoenix area. We will use cutting edge methods to develop a validated **Barrow Sleep Zone Score** capturing beneficial and adverse environmental influences on sleep and healthy neurologic aging using:

Blue Zone-inspired Exposomics:

Chemical, Noise, and Light Exposures || Lifestyle || Diet || Social Behaviors || Exercise and Physical Activity

Non-invasive Multimodal Sleep Assessments:

Wearables || At-home Monitoring || Circadian Profiling

Clinical and Blood Biomarkers of Aging:

Neuroinflammation || Neurodegeneration || Resilience

Barrow, the Place for Neuro Innovation

Barrow's position as the largest neuroscience center in the U.S., its internationally recognized leadership in environmental determinants of neurologic health, and its long-standing record of scientific collaboration within and beyond the Phoenix metropolitan area uniquely qualify it to lead this project. Support from the Barrow Women's Board offers a rare opportunity to fund an initiative that is:

Innovative and first-in-class

Highly translatable to the community

Deeply aligned with extending healthy lifespan and brain vitality



Women in Sleep Congress 2026

What I do to preserve brain health?

- ✓ Sleep 7-9h/night (except on call)
- ✓ CPAP + Tirzepatide → OA
- ✓ ASA 81 mg
- ✓ Fish Oil (Krill Oil)





Key Takeaways

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- ✓ Prioritize sleep.
- ✓ Move daily and build strength.
- ✓ Protect vascular health.
- ✓ Eat plants and healthy fats.
- ✓ Focus on sustainable prevention.
- ✓ Get your labs checked.
- ✓ Stay connected to people.
- ✓ Put your money towards things that count.
- ✓ Practice what you preach!



Women in Sleep
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Helpful Audio and Social Media Resources:

Shelby Harris, PsyD (@sleepdocshelby)

Barbie Boules, RDN (@the_cognition_dietitian)

Practically Healthy Podcast by Dr. Melina

Sleep is my Waking Passion (Dr. Allison Kole)

Summary

- Sleep disturbance (decreased slow wave sleep and REM sleep) has been associated with abnormal accumulation of amyloid- β and tau proteins.
- Irregular sleep-wake rhythms and circadian rhythm misalignment may precede AD and cognitive decline by decades.
- Sleep and Brain health have a bidirectional association.
- Supplements and lifestyle modifications can improve neurologic longevity.
- Ongoing research is needed to understand how we can study sleep and its impacts brain health and neurologic longevity.

Thank you!



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