

# Mind Matters

Alzheimer's Disease Research Center (ADRC)  
 Silberstein Alzheimer's Institute  
 Center for Cognitive Neurology

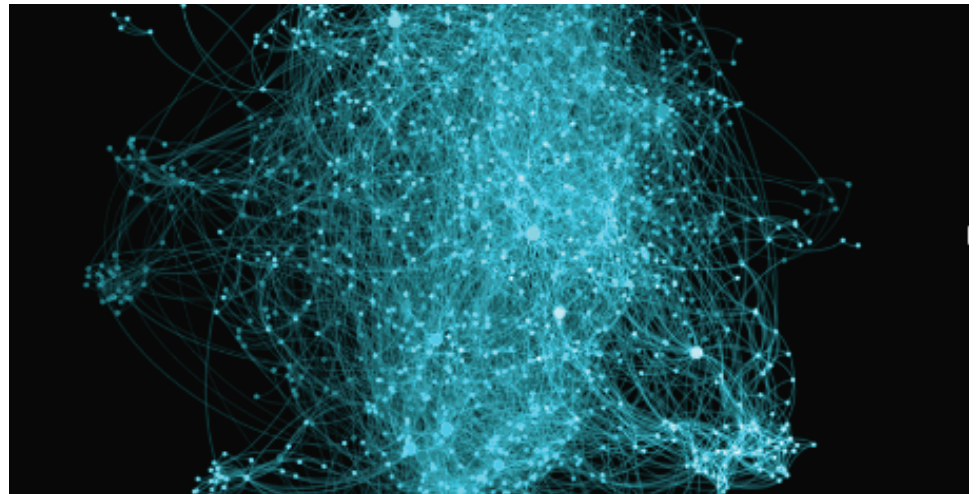
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### Section 1:

#### Artificial Intelligence for Early Detection of Alzheimer's Disease

*By: Narges Razavian, PhD*



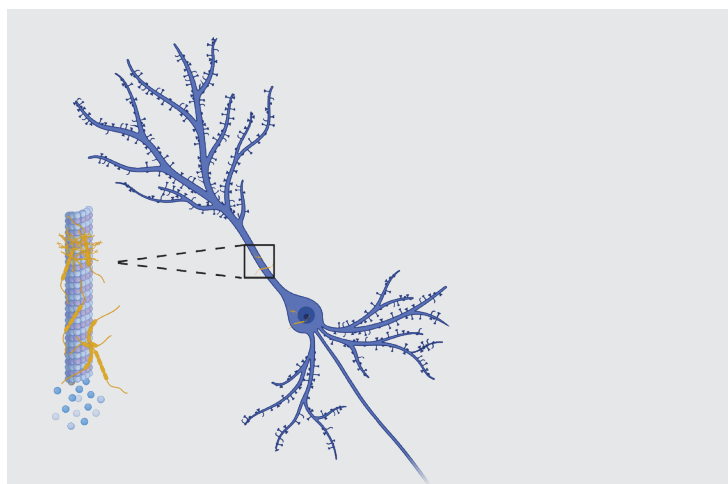
This image shows the links between patient health variables and cognitive impairment. Each point represents a piece of health information, such as blood pressure, glucose levels, kidney health markers, sleep, mobility, measured in almost 1423,000 subjects. The connections between points indicate the relationships these millions of points have with each other. Artificial intelligence automatically learns about these variables and their relationships and uses them to calculate each subject's individual risk of cognitive impairment, providing an opportunity for early, personalized intervention. Image courtesy of Narges Razavian, PhD, and Weicheng Zhu.

Currently, FDA-approved therapies for Alzheimer's disease are most effective at early stages of cognitive impairment, and the majority of the clinical trials focus on early stages of the disease. This highlights the importance of cognitive screening and early detection. However, early detection is still not accessible to most high-risk individuals. According to the Alzheimer's Association's annual report, only 16% of older adults are regularly screened by their primary care providers. Risk factors, such as education level and cardiovascular conditions, correlate with gender, race, and socio-economics status. Existing health disparities prevent a substantial portion of the population from obtaining access to therapies that are only effective at early stages of the impairment.

Artificial Intelligence (AI) has made tremendous achievements in many aspects of daily life. The same methods that run models like ChatGPT, Siri, or Alexa, can also be applied to health data, brain images like MRIs, or health records residing in hospital systems, to help identify patients who likely have Alzheimer's disease at different stages. In one of our studies published in Nature Scientific Reports (2022), we have shown that only looking at a simple brain MRI, an AI model can be close to 90% accurate in distinguishing cognitively normal vs. cognitively impaired stages of the disease. Moreover, our models can also

identify these conditions at presymptomatic stages of cognitive decline. In another study, we showed that even without MRI data, we can assess the risk of the future onset of the disease using information in health records. These findings are immediately applicable to clinical settings and may aid clinicians in offering better preventative care and better FDA-approved therapies at a much more accessible scale. AI also helps identify new risk factors and regions of the brain involved in early disease stages, which can pave the way for the design of better therapies. Early applications of AI in Alzheimer's disease and dementia have been highly promising, and future advances will undoubtedly lead to more breakthroughs.

**Section 2:**  
**Tau in Alzheimer's Disease:  
Another Avenue for Treatment?**  
**By: Isabel Reyes and Arjun Masurkar, MD, PhD**



Tau toxicity within a neuron (brain cell).

Amyloid and tau are the two main abnormal proteins that define Alzheimer's disease. Amyloid is deposited as plaque outside brain cells, whereas tau develops "tangles" within the brain cells. Research has suggested that amyloid develops first, and then triggers tau abnormalities. Although amyloid has garnered the most attention, studies on tau have been steadily gaining traction over the past two decades.

Under normal conditions, tau is an essential scaffolding protein for transporting nutrients and vital signaling molecules within brain cells. In Alzheimer's disease, tau undergoes chemical changes and forms tangles, leading to dysfunction and destruction of brain cells. This tau pathology evolves during Alzheimer's disease in manner distinct from amyloid, appearing early on in memory areas and later in other brain areas to impact different forms of thinking and function.

In recent years, clinical trials have also been focusing on reducing tau pathology or protecting the brain from its effects through a variety of molecular and immune-based methods. These clinical trials have not been successful, suggesting that our knowledge about tau needs improvement. Researchers at the NYU Alzheimer's Disease Research Center (ADRC) are working to figure out how tau becomes abnormal and what drives its spread across the brain, in the hopes of discovering new treatments. A key advance for this work has been the development of tau PET brain scans. While not used clinically just yet, such tau scans are used in the NYU ADRC aging study. With this tool, we can image the location and extent of tau in the brains of living persons, and track its evolution and impact on thinking and function in time.

In the coming years, we expect more studies and trials centered on tau that will improve our overall understanding of Alzheimer's disease. Unraveling the mysteries of tau offers a glimmer of hope to improve the treatment options for patients with Alzheimer's disease.

**Section 3:**  
**Positive Psychosocial Factors and Health Outcomes**  
**By: Brianna Morgan, PhD, CRNP, ACHPN**

Have you ever heard of the power of positivity? Research shows that certain positive psychosocial factors may be protective against cognitive decline and dementia. The strongest evidence points to three positive factors as being most protective: well-being, stress management, and social support.



**Well-Being**

Well-being is a complex concept with many different parts. The simple definition is living life in a way that is consistent with your goals, values, and potential. A recent research study from Willroth and colleagues (2023) followed 348 older adults over time and showed that those who had better well-being at baseline had better cognition later on, relative to their brain status on imaging. This was true even when the researchers took other factors into account, like education,

finances, and depression. Given the link between well-being and better cognition, there are things that you can do now to focus on supporting your well-being. An essential part of well-being is understanding and focusing on the things that give your life meaning. Take a moment and write down what gives your life meaning. For example, some people may say they find meaning through spending time with their loved ones, giving back to their community through volunteering, or attending religious services. Then try to do at least one activity each day that gives you meaning.

**Stress Management**

Stress management is another positive factor that can influence cognition. Zahodne and colleagues (2014) studied many positive factors in 482 older adults to identify which factors were most predictive of preserved cognition. The authors found that stress management was one of the positive factors most linked to preserved cognition. Specifically, the authors pointed out that self-efficacy, which is a belief in your ability to successfully carry out a task, was most important. You can do small things to support self-efficacy, including setting achievable goals, breaking tasks into smaller steps, celebrating your victories, and seeking support when things don't go so well.

**Social Support**

In the same study, Zahodne and colleagues (2014) found that social support was also an important positive factor associated with improved cognition. Social support has many components and includes not just the number but also the quality of relationships. Researchers are focused on identifying the specific protective components of social support that influence cognition. One study of 578 older adults demonstrated that friendships, specifically, were the most influential component of social support on cognition across White, Black, and Hispanic older adults. Therefore, continuing to engage with friends and social networks is an important factor in supporting your brain health.

**Section 4:**  
**Feed your Gut, Feed your Brain**  
**By: Emily Johnston, PhD, MPH, RDN, CDCES**



The health of the gut and the health of the brain are intricately linked. What you eat, where you live, how you spend your time, medications you take, whether you smoke or consume alcohol, and other lifestyle factors have an impact on the health of your gut microbiome. The microbiome is the community of organisms that live in our intestines, break down food, and produce important compounds that the body needs. The balance in the gut microbiome is related to more than just dietary choices, but what you eat can help keep your gut microbiome healthy, which can keep your brain healthy.

High fiber foods are great for the gut – fiber is an indigestible carbohydrate that can help keep you regular, help keep you full between meals, and provide food for the healthy bacteria that live in your gut. Try some fermented foods, too, like kimchi, sauerkraut, miso and tempeh, yogurt and kefir (just opt for plain, unsweetened versions when you can and add in your own fruit). A diet high in added sugar, saturated (animal) fat and sodium and low in fiber, provides fewer nutrients for those good gut microbes. Feed your gut with fresh fruits and vegetables, whole grains, nuts and seeds. These foods are the foundation of the Mediterranean DASH Intervention for Neurodegenerative Delay (MIND) diet and are also good for the brain!

There is still much that is unknown about the human gut microbiome and limited evidence for taking supplements, but you can reduce your risk of disease and improve the health of your gut environment by making a few changes to your diet. Start with small swaps like adding beans to your tacos, soups or a stir fry where you might usually consume meat, choosing whole grain breads and cereals where you might usually have refined grains, and snacking on fresh fruits and veggies instead of processed snack foods. Don't forget to add in some fermented foods, too! Read more about the gut-brain connection and Alzheimer's Disease

here: <https://www.nia.nih.gov/news/beyond-brain-gut-microbiome-and-alzheimers-disease>.

**Section 5:**  
**Support for Family Caregivers of People with Dementia is Proven to be Essential**  
**By: Cynthia Epstein, LCSW; Thea Micoli; and Mary Mittelman, DrPH**



*A Place For Us* participants' collaborative collage of the Manhattan skyline. *A Place for Us* is a part of the **Alzheimer's Disease & Related Dementias Family Support Program**, funded by the State of New York.

The NYU Alzheimer's Disease and Related Dementias Family Support Program, recently re-funded with a second five-year multimillion dollar grant by the NYS DOH, provides free services and resources for families who are adjusting to the changes and challenges in thinking and behavior that dementia can present.

The name of our program is abbreviated to FSP. Is this an acronym you may have missed, as we are confronted by so many these days? Then you may have missed out on all the resources and programs provided by the Family Support Program (FSP) for people with memory problems and their friends and family caregivers. The FSP is here for you at whatever point you and your family member find yourselves in the caregiving journey. Support is available for those who have recently been diagnosed with memory issues and for the family members and friends who are touched by the changes in behavior and thinking that people with memory problems may experience. We are also available to support you if you are caring for those whose illness has progressed to the middle or late stages. Most of our offerings are provided online, making it easy for busy caregivers to participate.

The staff of the FSP is comprised of varied disciplines. When you first call us, you will speak with a community health representative who will complete a short intake interview which will initiate your enrollment in the program. The community health representative can also answer

your questions about our programs. If you choose, you can be connected with one of our four experienced social workers trained in caregiver support, who will get to know you, discuss your caregiving experiences and needs and guide you in accessing the FSP programs as well as others relevant to your interests and concerns.

Our multifaceted program offerings include:

Individual and family meetings with licensed clinical social workers.

Specially designed educational opportunities:

- A daily arts-based program, led by a recreational therapist, in person or on Zoom, for people with memory issues.
- Community arts activities for people with dementia together with their family caregivers include specially curated visits to museums, gardens and cultural events, in person and online.
- A Buddy Program, in which a person with memory loss is matched with an NYU student, to share activities at home and in the community.
- Groups for caregivers, including support groups and regular informal drop-in groups, which we call Kaffeeklatsches.

If you or someone you know is providing care for a person with memory problems, the FSP can help navigate this journey with innovative programs and professional guidance. For more information or to enroll, call 646-754-2277 or email [family.support@nyulangone.org](mailto:family.support@nyulangone.org).

**Section 6:**  
**What's New at the Alzheimer's Disease Research Center (ADRC)**

**MEET THE NEW STAFF!**



**Alison Pietras, PA-C** joins the Center for Cognitive Neurology as a Physician Assistant (PA) working with the Alzheimer's Disease Research Center (ADRC) and the Pearl I. Barlow Center for Memory Evaluation and Treatment. She has passionately worked in the field of cognitive neurology at Brigham and Women's Hospital for over a decade, initially as a neuropsychology technician, followed by a research coordinator of Alzheimer's disease clinical trials and most recently as a PA. Her experience as a PA includes providing exceptional longitudinal care for patients and families, building and growing a lumbar puncture clinic, and being a sub-investigator and principal investigator of Alzheimer's disease clinical trials. In her spare time, you will find Alison in spinning or yoga class, cooking, with friends, and slalom water skiing on a lake.



**Abena Dinizulu** joins the ADRC as an Outreach Program Coordinator. Abena holds a BS degree in health and nutrition science with a concentration in public health from Brooklyn College, CUNY. She has spent over two years as a Research Coordinator at Brooklyn College's Immigrant Health Lab, collaborating closely with Dr. Margrethe Horlyck-Romanovsky on various initiatives aimed at improving the health outcomes of immigrant populations, particularly those of African descent. Notably, Abena facilitated a Diabetes Prevention Program tailored specifically for Black Caribbean individuals at risk of type 2 diabetes. Currently, Abena is actively involved in an NIH-funded Community-Based Participatory Research Program study, where she works closely with the Ghanaian immigrant community in New York City to address mental health and well-being. Abena also served as a research fellow through the Pathways into Quantitative Aging Research Summer Program at NYU School of Global Public Health. It was during this time that she was introduced to the ADRC team and began her journey towards her current role as an Outreach Program Coordinator. In her free time, Abena enjoys cooking homemade meals, brewing kombucha, and spending time outdoors.



**Jennifer Liu** has been volunteering with the ADRC since September 2023, taking on responsibilities such as recruiting and facilitating psychosocial interviews.

With a background spanning twenty years in retail marketing and talent development within the international retail business, Jennifer's recent consulting work involved outreach program planning and marketing for a pharmaceutical company targeting Asian and Latino older Americans with osteoporosis, igniting her passion for aging care. Motivated also by a family member's Alzheimer's diagnosis, she is now enrolled in a Master of Science in Aging program with Arizona State University. Jennifer aims to bridge resources for underserved older populations, particularly immigrants coping with dementia. She is committed to contributing to Alzheimer's disease research and addressing the needs of our aging community.

Jennifer has lived in various cities such as Vancouver, Taipei, Hong Kong, and now New York, nurturing a love for travel, cultural exploration, and sampling local cuisines. She maintains an interest in the arts, including film, theater, and museums, occasionally experiments with oil painting herself.

**NOTEWORTHY EVENTS**



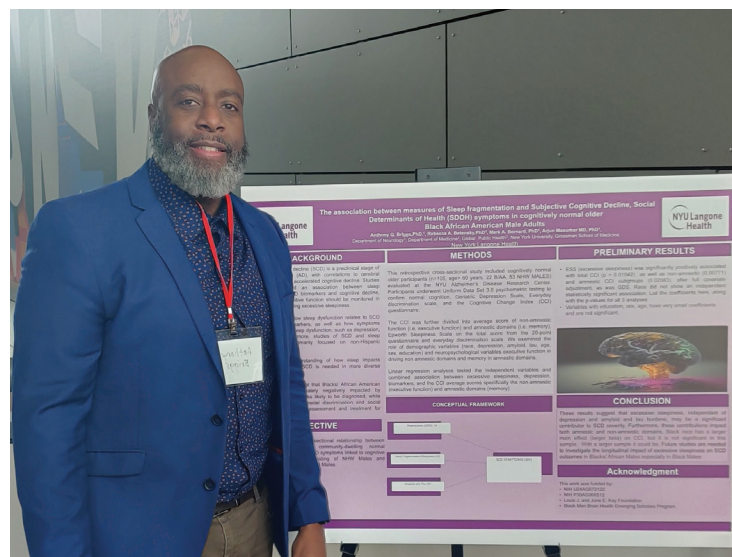
Panel discussion following the film viewing featured Cynthia Stone - Director/Producer (on screen). From right to left: Joshua Chodosh, MD - Director of the ADRC Outreach Recruitment and Engagement Core; Magda Kaczmarek, MFA - Atlantic Fellow for Equity in Brain Health; Rebecca Salant - NYU Alzheimer's Disease and Related Dementias Family Support Program; Julie Gayer-Kris, LMSW - Senior Director of Adult and Wellness Programs 14Y and Sirovich (panel moderator).

*Film Screening and Panel Discussion*  
*Keys Bags Names Words: Hope in Aging and Dementia*

The ADRC collaborated with DanceStream Projects, the 14th Street Y, Sirovich Center for Balanced Living, and the NYU Alzheimer's Disease and Related Dementias Family Support Program to screen the documentary *Keys Bags Names Words: Hope in Aging and Dementia*, produced and directed by Cynthia Stone, an award-winning filmmaker based in San Francisco Bay Area.

The film is a quirky and inspiring lens portraying stories of both the personal and global impacts of Alzheimer's disease and other forms of dementia, while following a cohort of young scientists and artists from around the world as they harness every aspect of creativity, humor and compassion to lead the way towards hope and resilience. Events were held in person at the 14th St Y (December 2, 2023) and virtually (March 12, 2024). Learn more: [www.keysbagsnameswords.com](http://www.keysbagsnameswords.com).

## AWARDS



Anthony Q. Briggs, PhD, faculty and researcher in the Department of Neurology and the ADRC, was awarded the Alzheimer's Association Research Fellowship (AARF-D) in January 2024. The AARF grant program is intended to support exceptional researchers who are engaged in their post-graduate work and working in diverse areas of research. Dr. Briggs will be funded for the next 3 years in his ongoing research that examines the association of sleep duration, cerebral blood flow, and subjective cognitive decline in Black/African Americans. With this funding, Dr. Briggs is to determine how alterations in cerebral blood flow relate to Alzheimer's disease pathologies and cognitive decline and to create critical medical culturally sensitive strategies that may be developed to promote overall brain health and aging. Ideally, the goal is to reduce the risk, prevent, and slow down the progression of Alzheimer's disease.

Additionally, Dr. Briggs' first-author publication exploring the drivers of memory loss in mild cognitive impairment due to Alzheimer's disease versus vascular disease will soon appear in *Alzheimer Disease & Associated Disorders*.

## Section 7: How Sleep Changes as We Age By: Oliver Cesar



Oliver Cesar, ADRC Research Education Component Scholar-Trainee

As we get older, it is common to experience changes in our sleep patterns. Even if we are healthy and not taking any medication, our sleep tends to shift naturally. In many cases, as we age, we might find ourselves sleeping less overall, having more difficulty falling asleep, and waking up more frequently during the night. These changes are not just about feeling tired or our body's internal clock working less well; they are part of the normal aging process.

One of the major contributors to changes in sleep with age is because of shifts in our body's internal clock, located in the part of the brain called the hypothalamus. This clock, comprised of thousands of cells forming the suprachiasmatic nucleus (SCN), governs our daily rhythms, dictating when we feel sleepy or alert. With age, the signals from the SCN can weaken, impacting these rhythms and causing us to feel tired or awake at different times.

Furthermore, hormonal changes that occur as we age can also influence our sleep patterns. For instance, melatonin, the hormone that regulates sleep by responding to darkness and following our daily rhythms, tends to decrease in production as we grow older. Studies have shown that nocturnal melatonin levels in older adults are notably lower compared to younger adults, potentially contributing to sleep disturbances among the older population. Another crucial hormone, growth hormone, which is closely linked to deep sleep, diminishes in secretion with age. This decline typically begins in adolescence, accelerates through young and middle age, and slows down in older age, mirroring the decrease in deep sleep observed with aging. The reduction in the growth hormone secretion during sleep may contribute to the decline in deep sleep seen in older adults.

Aging is also associated with an increased risk of medical comorbidities, which can indirectly affect sleep. Many adults turn to medication as a form of treatment for these medical comorbidities, and changes in sleep can also be attributed to medication side effects. Alarmingly, nearly 40% of adults over the age of 65 take five or more medications, with about 90% using prescription drugs to manage chronic medical conditions.



It is crucial to recognize that aging affects sleep differently for each individual. While some older adults may continue to enjoy restful sleep, others may struggle to achieve it. Between 40% and 70% of older adults grapple with sleep problems, and many may be simply unaware of their presence. These issues can significantly disrupt daily routines and diminish overall quality of life. Common sleep challenges faced by older adults include chronic pain, which can disrupt sleep, as well as increased nocturnal awakenings due to factors like bladder control issues. Sleep disorders such as insomnia, which is characterized by persistent difficulty falling or staying asleep, are also prevalent among older adults. Additionally, sleep apnea also becomes more common with age. Sleep apnea is characterized by pauses in breathing during sleep and leads to multiple awakenings and fragmented sleep.

In summary, aging is associated with a myriad of changes in sleep, including decreased sleep duration and efficiency, increased nocturnal awakenings, and a decline in deep sleep. However, it is essential to recognize that sleep issues in older adults are not solely attributed to aging; various factors, such as health conditions, lifestyle changes, and environmental influences, may also play significant roles.



### "Health Jeopardy"

The ADRC is making learning fun. We partner with older adults consultant, Lenore Glickhouse, to play "Health Jeopardy" at Older Adult Centers, and game topics include Alzheimer's disease research and clinical trials. ADRC staff help facilitate the game and host a resources table to talk about participation in research and other opportunities. We invite older adults to play "Health Jeopardy" by joining teams or participating as audience members, with prizes awarded to contestants and smaller giveaways provided to the audience. Participants have been overwhelmingly attentive, curious, and enthusiastic to play or watch.

The ADRC helped run three Jeopardy games in English and Spanish, between January – March 2024 in Manhattan at Henry Street Settlement (334 Madison Street) and Carter Burden (312 E. 109th St and 351 E. 74th Street) with more to come!



**Section 8:**

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