



HIV and Aging: Exploring Brain Health and Cognition

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Disclosures

- I have no potential conflicts of interest to disclose.
- I currently receive grant funding from the National Institutes of Health.
- Some of the slides are derivative of the work I did with the Association of Nurses in AIDS Care (ANAC) on Aging with HIV series. We were given permission to use these slides and share their information.



Objectives

- Examine the intersection between aging and HIV and how it increases the risk for poorer brain health and cognitive functioning.
- Review the literature on cognitive aging with HIV.
- Explore methods and interventions to promote brain health and prevent cognitive decline as people age with HIV.
- Review general patient assessment and management tools for adults living with HIV.



Scope

- Brain health and cognition in adults aging with HIV is a huge topic and the knowledge base is growing fast.
- This presentation is:
 - Based on the most current, available evidence
 - Focused on preventing cognitive decline and reducing the effects of cognitive aging
 - Designed to introduce medical professionals to these issues. All learners are encouraged to review the references and reach out to psychologists, neurologists, and others in order to learn more about these issues.
 - Cognitive aging with HIV is heterogenous.



Abbreviations

ART: Anti-Retroviral Therapy

HIV: Human Immunodeficiency Virus

HAD: HIV-Associated Dementia

HAND: HIV-Associated Neurocognitive Disorder

MND: Mild Neurocognitive Disorder

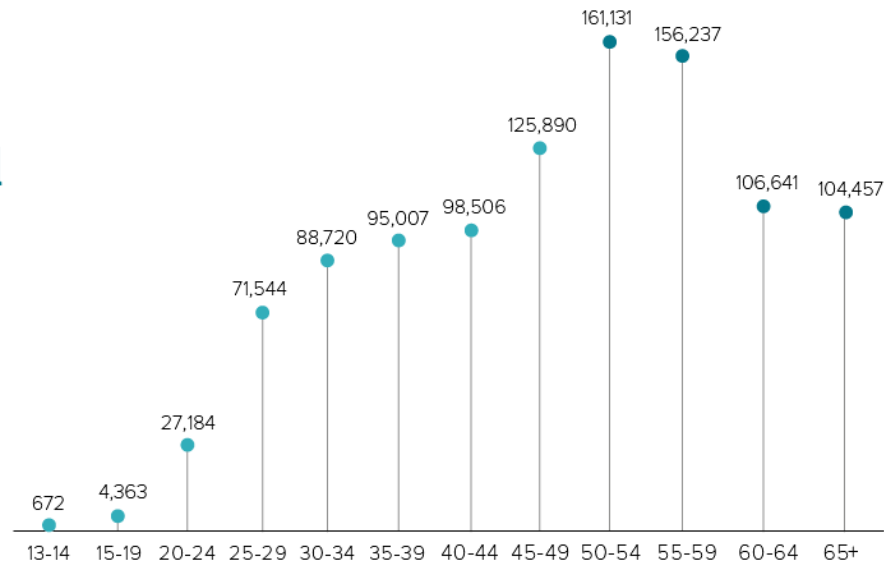
PLWH: People Living with HIV

Aging with HIV: Context

1. Multi-morbidity in People Living with HIV
2. Such multi-morbidity can also impact brain health and cognition.
3. By 2030, 70% of People Living with HIV will be 50 and older in the U.S. (Winger, 2016)

Adults and Adolescents with Diagnosed HIV in the US and Dependent Areas by Age, 2018

Over half of people with diagnosed HIV were aged 50 and older.



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2018 (updated). *HIV Surveillance Report* 2020;31.

Aging with HIV: Context

Brain health and optimal cognitive functioning is essential for successful aging with HIV.

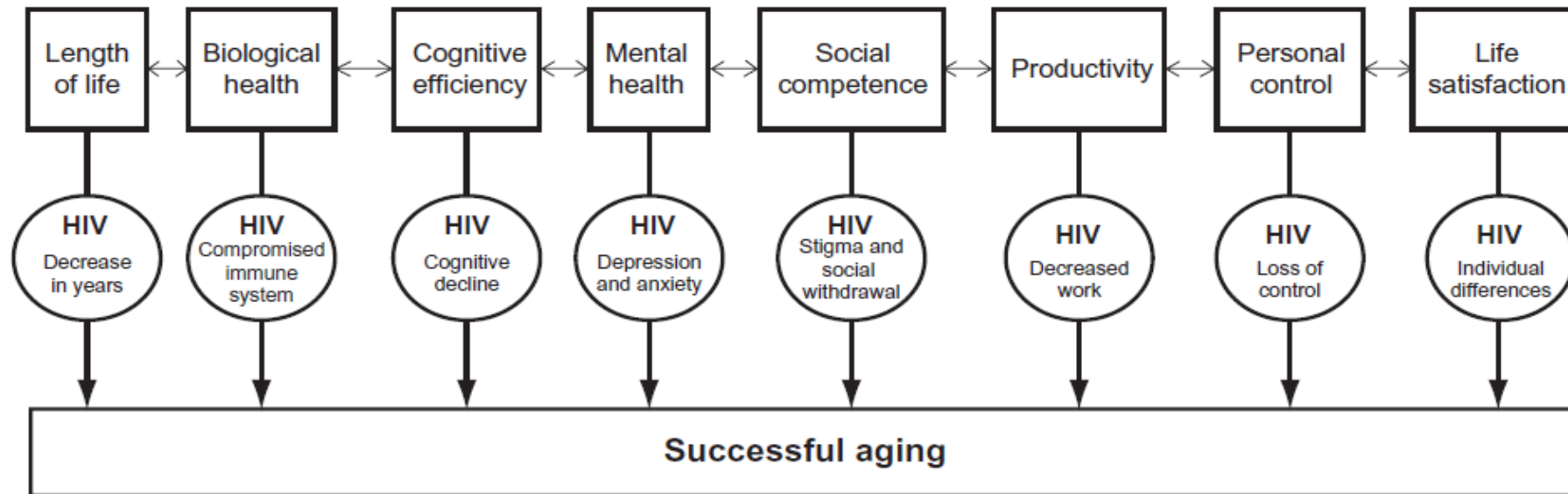
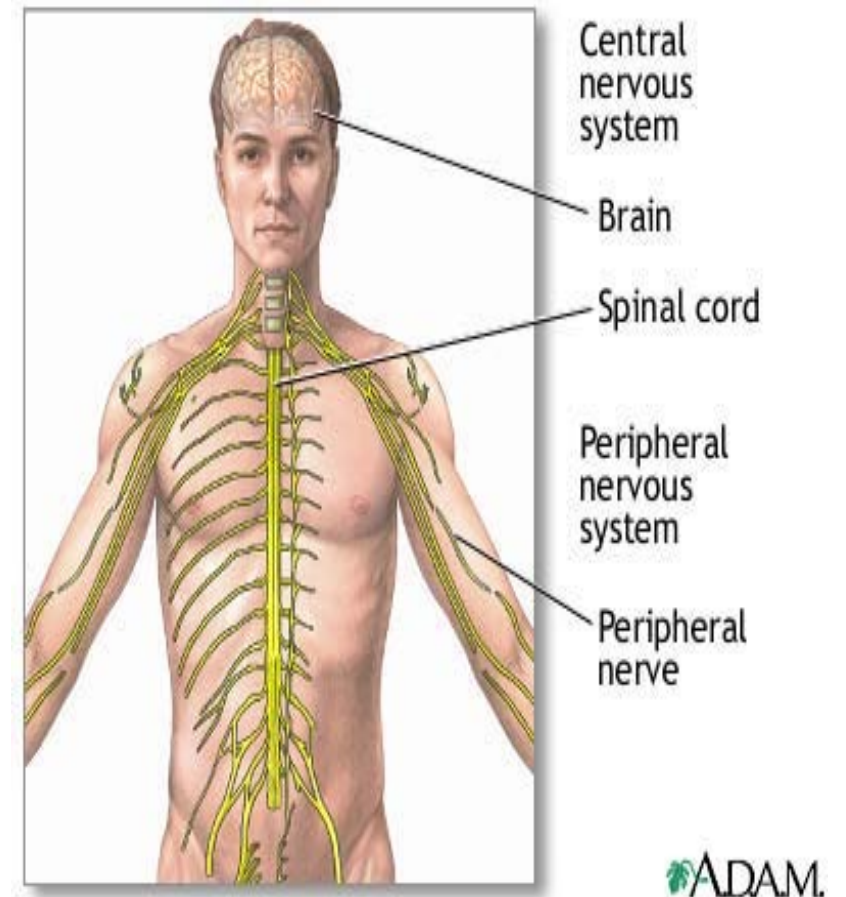


Figure 1 Factors of and obstacles to successful aging with HIV.

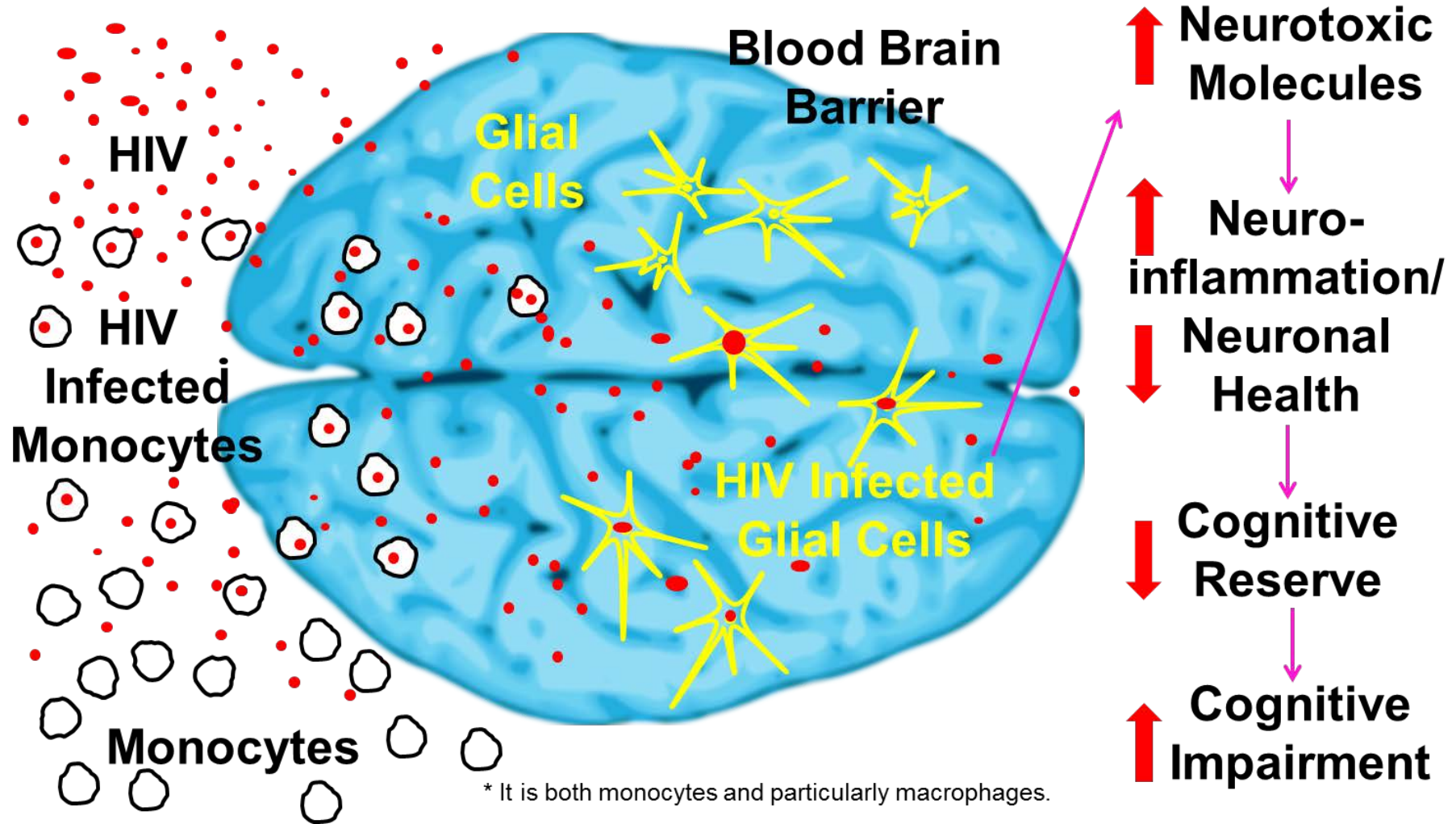
HIV Impacts the Nervous System

Primary HIV-Neurological Problems

- **HIV-associated dementia and cognitive motor disorders**
- Myelopathy (inflammation of the spinal cord)
- Peripheral neuropathy (damage to the nerves of the peripheral nervous system)
- Myopathy (muscular weakness)



HIV Crosses the Blood Brain Barrier

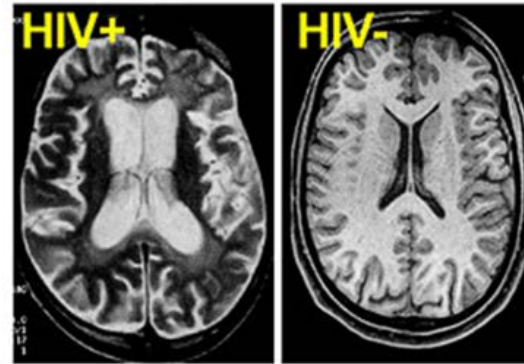


HIV and the Brain

- The human immunodeficiency virus (HIV) crosses the blood-brain barrier and leads to neuropathological changes.
- The virus has a preference for the frontal-striato-thalamocortical loops.
- In the post-cART era classical HIV-associated brain pathology is less prevalent, but ongoing neural injury may be caused by low-level viral replication in the CNS and chronic inflammation.

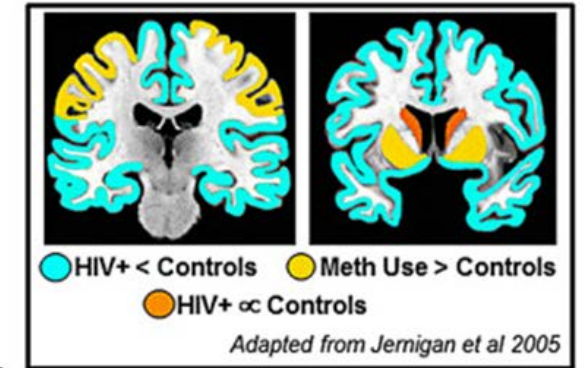
Neuroimaging Studies Showing Brain Injury in HIV+ Participants

Brain Atrophy in an HIV Patient



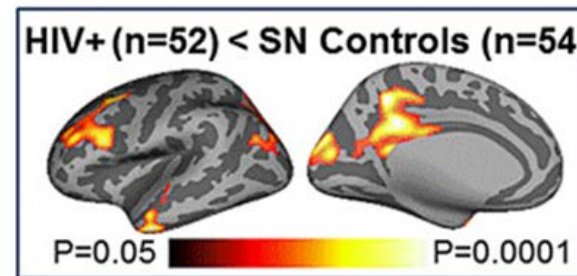
A

HIV+ & Meth Use on Volumes



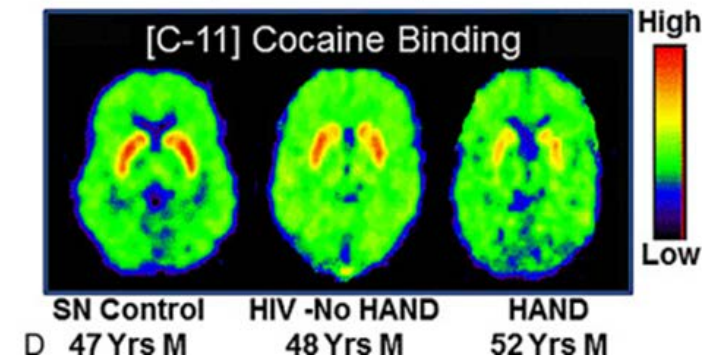
B

Smaller Cortical Volumes in HIV



C

Lower Dopamine Transporters with HAND



D

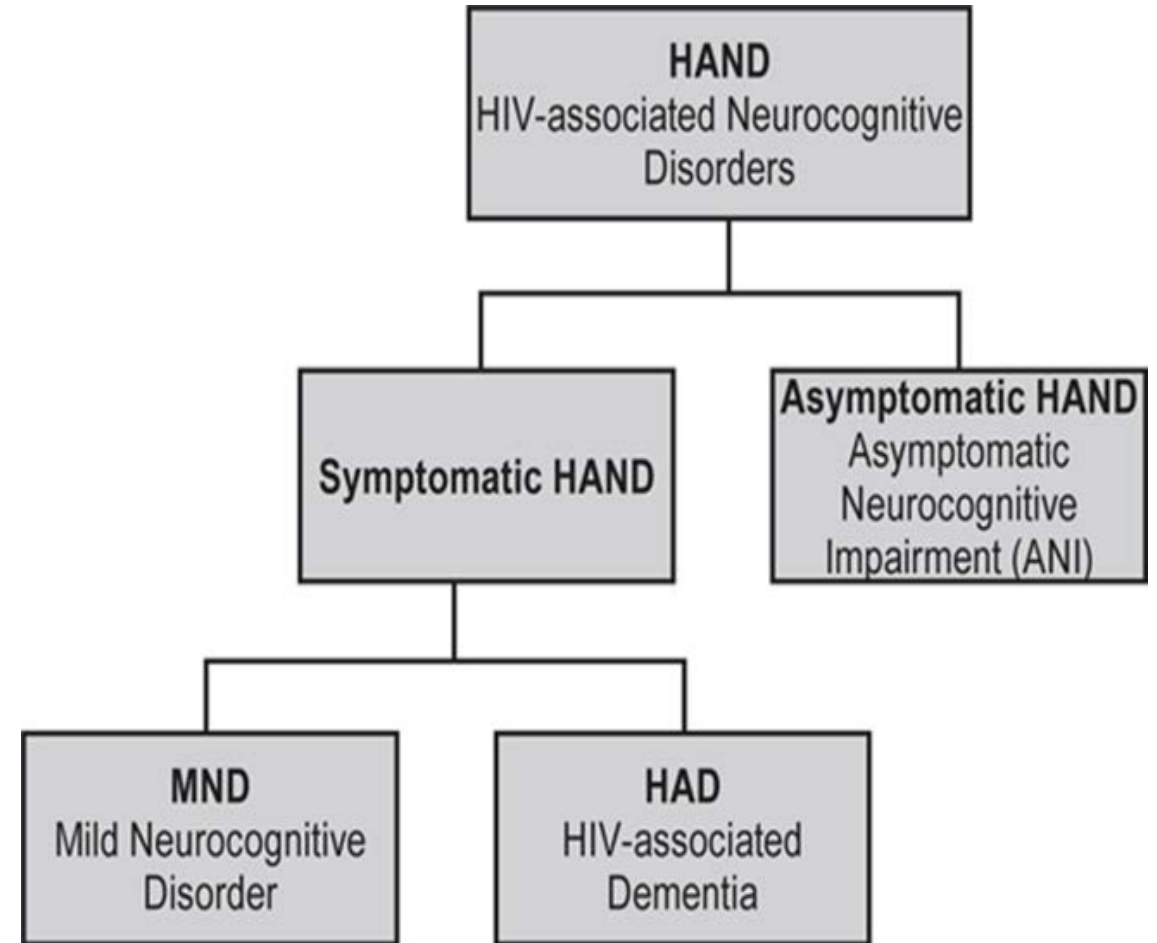
Agenda

- 1. Intersection of Cognitive Aging with HIV**
- 2. Risk Factors of Cognitive Decline**
- 3. Assessment of Cognition and Everyday Function**
- 4. Prevention and Treatment Strategies**



1. Intersection of Cognitive Aging with HIV

- Some cognitive decline and cognitive complaints are a part of normal aging.
- PLWH are at an increased risk for cognitive and functional impairment as they age.
- Approximately 30-50% of PWH have some form of HIV-Associated Neurocognitive Disorder (HAND)



Everyday Functioning Compromised by Poor Cognition

Instrumental Activities of Daily Living

- (Heaton et al., 2004).

Financial and medical management

- (Heaton et al., 2004).

Medication adherence

- (Woods et al., 2009).

Employment

- (Woods, Weber et al., 2011).

Prone to risky decision-making

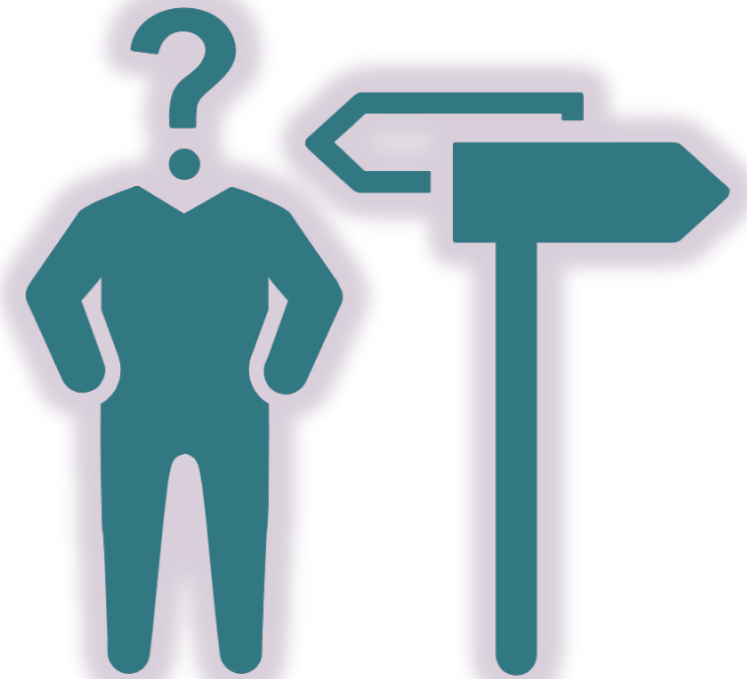
- (Hardy, Hinkin et al., 2006)
- (Martin et al., 2004).

Lower health-related quality of life

- (Doyle et al., 2012).

Higher risk of mortality

- (Ellis et al., 1997; Wilkie et al., 1998).

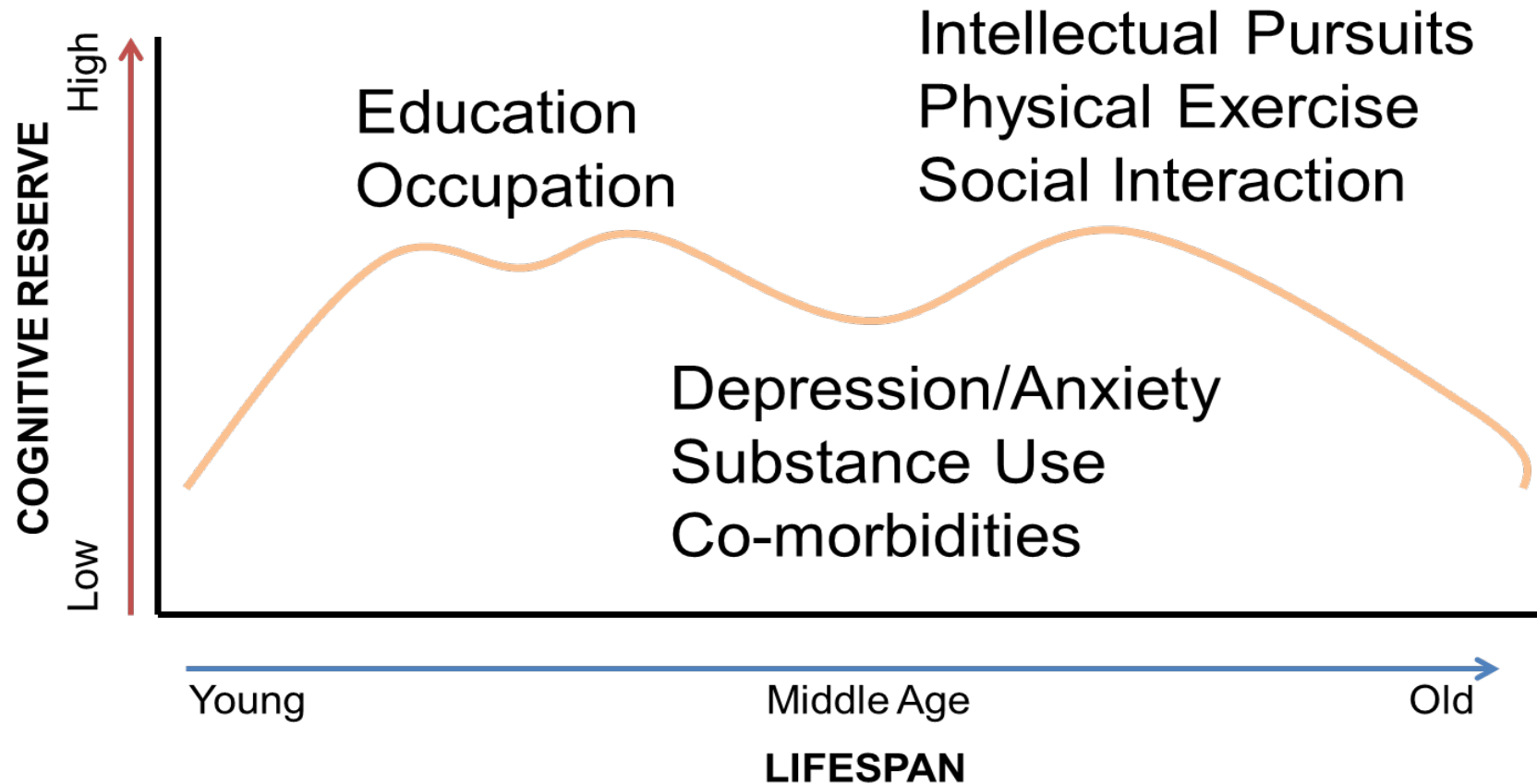


2. Risk Factors of Cognitive Decline

- Not all PLWH experience cognitive decline.
- It is important to be mindful of the role of cognitive reserve.
- Cognitive reserve is the ability of the brain to absorb insults and yet keep working.
- There are many factors involved in promoting or diminishing cognitive reserve, which can impact cognitive aging.



Cognitive Reserve over the Lifespan

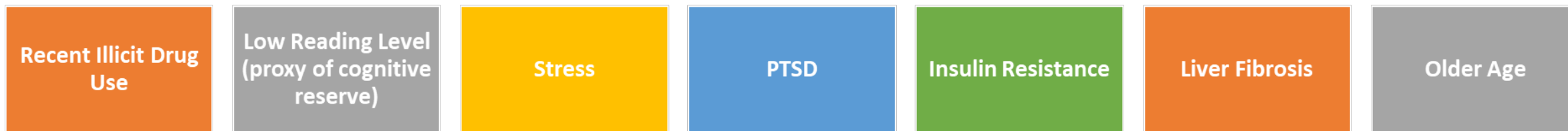


Cognitive reserve over the lifespan: Neurocognitive implications for aging with HIV. Vance, D. E., Lee, L., Muñoz-Moreno, J., Morrison, S., Overton, T., Willig, A., & Fazeli, P. L. (2019). *Journal of the Association of Nurses in AIDS Care*, 30(5): e109-e121. DOI: 10.1097/JNC.0000000000000071

Women's Interagency HIV Study

- 12 studies on cognition from 2013-2016 summarized
- HIV-infected women are more vulnerable to developing cognitive impairments than uninfected women.

Predictors of Cognitive Impairment:



Surprisingly, age X HIV interactions were not observed to impact neurocognitive performance, findings largely supported by the literature.

- Such interactions may be observed as the population ages.
- Age accentuates many of the factors associated with cognitive impairment (i.e., insulin resistance).



Ageing and neurocognitive functioning in HIV-infected women: A review of the literature involving the Women's Interagency HIV Study. Vance, D. E., Rubin, L. H., Valcour, V., Waldrop-Valverde, D., & Maki, P. M. (2016). *Current Trends in HIV/AIDS*, 13(6), 399-411. DOI: 10.1007/s11904-016-0340-x

Other Risk Factors in the HIV Literature

Stress, Depression,
Anxiety, Post-
traumatic Stress

Age

Income

Educational
Level/Attainment

Reading/Reading
Quality

Insulin Resistance

Hepatitis C/Liver
Fibrosis

Cognitive Activity
& Employment

Treatment Status
(viral load, CD4
count)

Substance Use

Head Injury

APOE-4



The intersection of cognitive ability and HIV: State of the nursing science. Waldrop, D., Irwin, C. Nicholson, W. C., Lee, C. A., Webel, A., Fazeli, P. L., & Vance, D. E. (2021). *Journal of the Association of Nurses in AIDS Care*, 32(3), 306-321. DOI: 10.1097/JNC.0000000000000232

3. Assessment of Cognition & Everyday Function

- **Brief Screeners**
 - MOCA
 - MMSE

- **Formal Cognitive Assessment with Normed (Age/Education)**

- **More automated approaches**
 - BRACE+ (L. Rubin)
 - NIH Toolkit
 -

Cognitive Domain	Assessment
Processing Speed	WAIS-III Digit Symbol
	WAIS-III Symbol Search
	Trail Making Test-A
Attention /Working Memory	Paced Auditory Serial Addition Test
	WAIS-III Letter-Number Sequencing
Learning and Recall	Hopkins Verbal Learning Test
	Benton Visuospatial Memory Test
Executive Function	Wisconsin Card Sorting test
	Trail Making Test-B
Verbal Fluency	Controlled Oral Word Association
Motor Skills	Grooved Pegboard



Frascati Criteria – HIV-Associated Neurocognitive Disorder (HAND)

Frascati Criteria for HAND	
HAND Type	Diagnostic Criteria
Asymptomatic Cognitive Impairment (ANI) (~21%-30%)	<ul style="list-style-type: none"> • > 1 SD below the normative mean in at least 2 cognitive domains • No impairment in daily functioning
Mild Neurocognitive Disorder (MND) (~5%-20%)	<ul style="list-style-type: none"> • >1 SD below the normative mean in at least 2 cognitive domains • Mild to moderate interference in activities of daily living
HIV-associated Dementia (HAD) (~2%)	<ul style="list-style-type: none"> • >2 SD below the normative mean in at least 2 cognitive domains • Marked interference in activities of daily living



Cognitive Composite Score

- Raw scores → *T*-scores (demographically adjusted for age, education, gender, and race/ethnicity when possible)
- *T*-scores → Clinical Rating Scores
 - Clinical Rating scores range from 1 – 9
- Clinical rating scores 5 or greater indicate impairment
- Higher scores represent worse cognitive functioning.

Clinical Ratings from <i>T</i> -scores		
<i>T</i> -scores	Clinical Rating	Descriptor
≥55	1	Above Average
45-54	2	Average
40-44	3	Low Average
--	4	Borderline
35-39	5	Definite Mild Impairment
30-34	6	Mild to Moderate Impairment
25-29	7	Moderate Impairment
20-24	8	Moderate to Severe Impairment
≤19	9	Severe Impairment



Everyday Functioning in People Living with HIV

- About 50% of older PWH experience difficulty with some aspect of everyday functioning.
 - Most often occurs in higher order instrumental activities of daily living (IADLs.)
- Deficits in IADLS can have important consequences:
 - Suboptimal medication adherence can lead to increased viral load/treatment resistance
 - Decreased functional capacity is associated with higher morbidity and mortality



Housework



Grocery Shopping



Money Management



Laundry



Getting Around Outside



Medicine



Preparing Meals



Telephone Use



Going Places Outside of Walking Distance

Assessment of Everyday Functioning

- Assessment of everyday functioning is difficult.
 - Self-report measures
 - Performance-based measures
 - Informant report

Factors That Affect Everyday Functioning

- Neurocognitive impairment
- Older age
- Depression
- Substance use
- Immunosuppression
- Hepatitis C coinfection

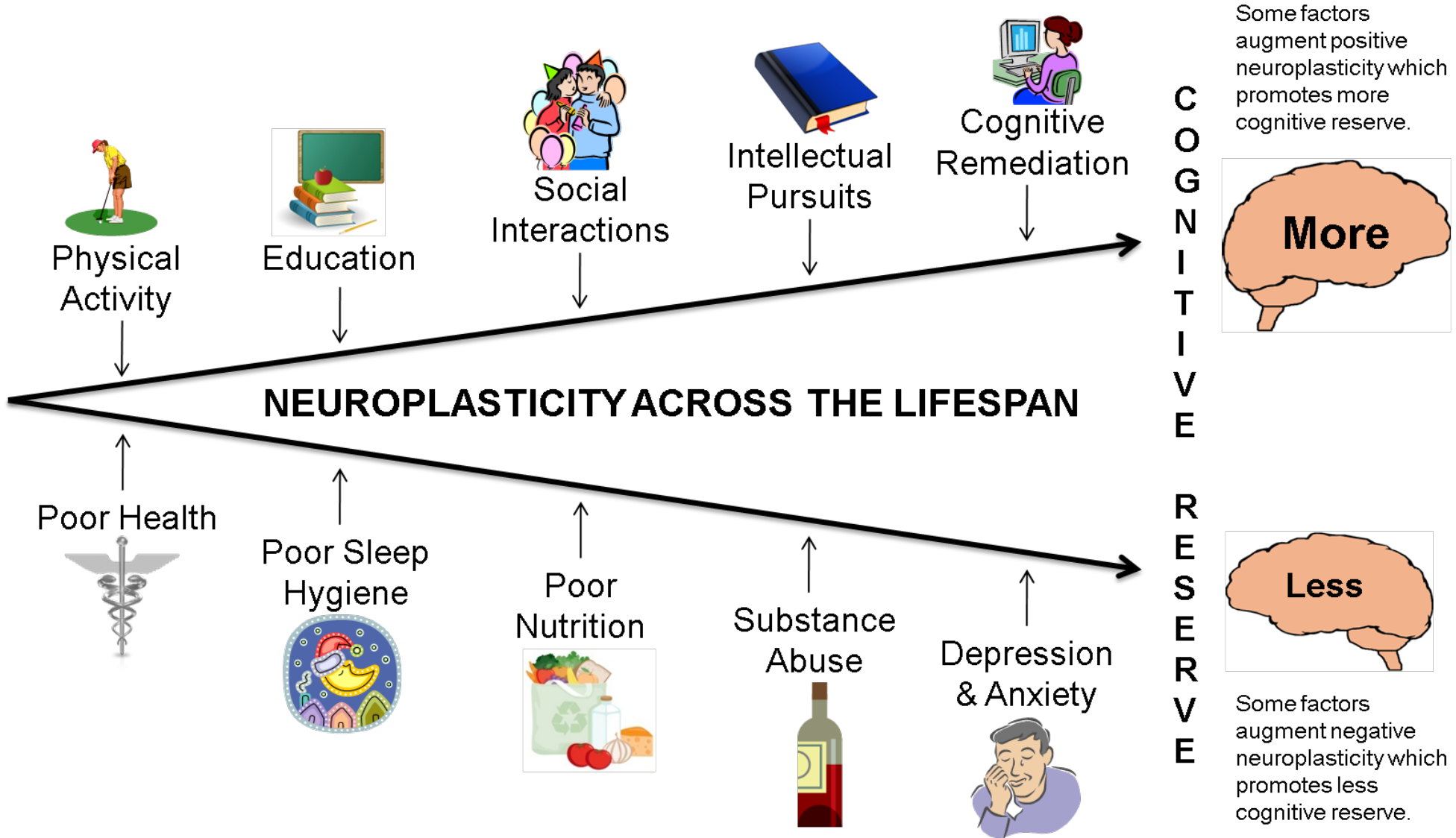


Awareness of Functional Capacity

- IADL performance relies on cognitive functioning, especially executive functioning and memory.
- Cognitive function has implications on an individual's awareness of their functional capacity.
- In seronegative and seropositive populations, cognitive impairments are associated with worse performance of IADLs and poor awareness/underreporting of IADL impairments.
- Lack of awareness of IADL impairments is related to worse health outcomes.



4. Prevention and Treatment Strategies



Do you ask your patients about what they do to help their brain to age?

If you do, do you know what to tell them?

4 FOCUS GROUPS → 30 OLDER (50+) ADULTS WITH HIV

- Expressed a variety of cognitive complaints that interfered with daily life
- Little knowledge of how of how to protect brain function with age
- Gross understanding that keeping active is important for brain health
- Passive acceptance of decreased brain function
 - *Nothing we can do!*



Perceptions of brain health and cognition in older African Americans and Caucasians with HIV: A focus group study. Vance, D. E., Gakumo, C. A., Childs, G. D., Enah, C., & Fazeli, P. L. (2017). Journal of the Association of Nurses in AIDS Care, 28(6), 862-876. DOI: 10.1016/j.jana.2017.07.006

Cognitive Training Programs

Cognitive Training/Brain Training computerized programs target to improve a variety of cognitive domains.

Meta-Analysis of 52 Computerized Cognitive Training Studies (Lampit et al., 2014)

Treatment/effects sizes varied widely by domain and by amount of training/dosage.

- Verbal memory ($g = .08$)
- Working memory ($g = .22$)
- Nonverbal memory ($g = .24$)
- Visuospatial skills ($g = .30$)
- Speed of processing ($g = .31$)
- Attention ($g = \text{non-significant}$)
- Executive functioning ($g = \text{non-significant}$)



Cognitive Intra-Individual Variability in HIV

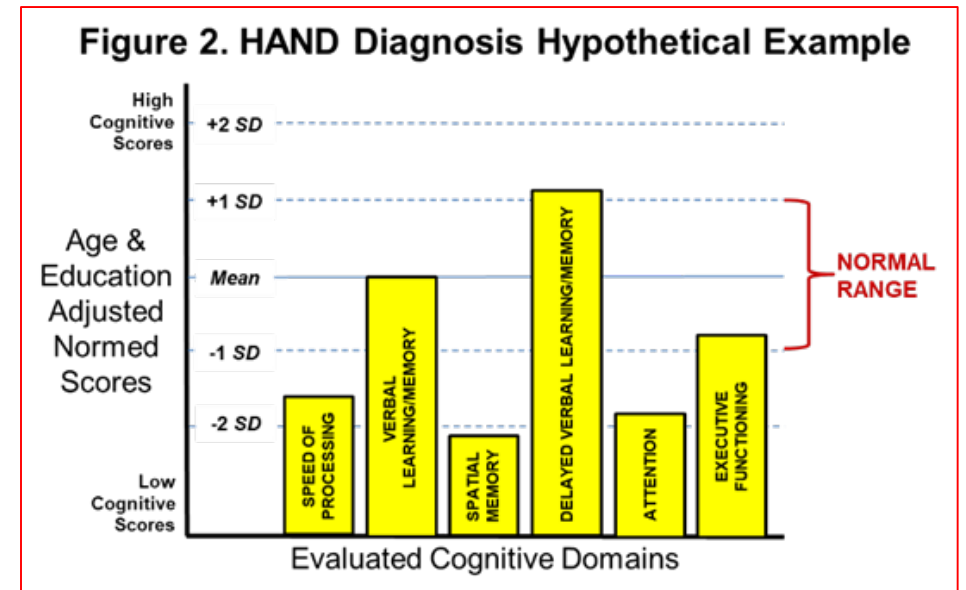
- This integrative review of 13 articles examined two types of cognitive IIV in PLWH, inconsistency and dispersion.
- Cognitive IIV appears to be a promising approach to detect subtle cognitive impairments that are not captured by traditional mean-based neuropsychological testing.
- Greater IIV in PLWH has been associated with:
 - 1) poorer cognitive performance and cognitive decline,
 - 2) cortical atrophy, both gray and white matter volume,
 - 3) poorer everyday functioning (i.e., driving simulation performance), specifically medication adherence,
 - 4) even mortality.
- First, greater cognitive IIV may reflect a greater task demand on executive control to harness and regulate cognitive control over time.



Cognitive intra-individual variability in HIV: An integrative review. (2022) Vance, D. E., Del Bene, V., Frank, J. S., Billings, R., Triebel, K., Buchholz, A., Rubin, L. H., Woods, S. P., Wei, L., & Fazeli, P. L. Neuropsychology Reviews, 32(4), 855-876. DOI: 10.1007/s11065-021-09527-x

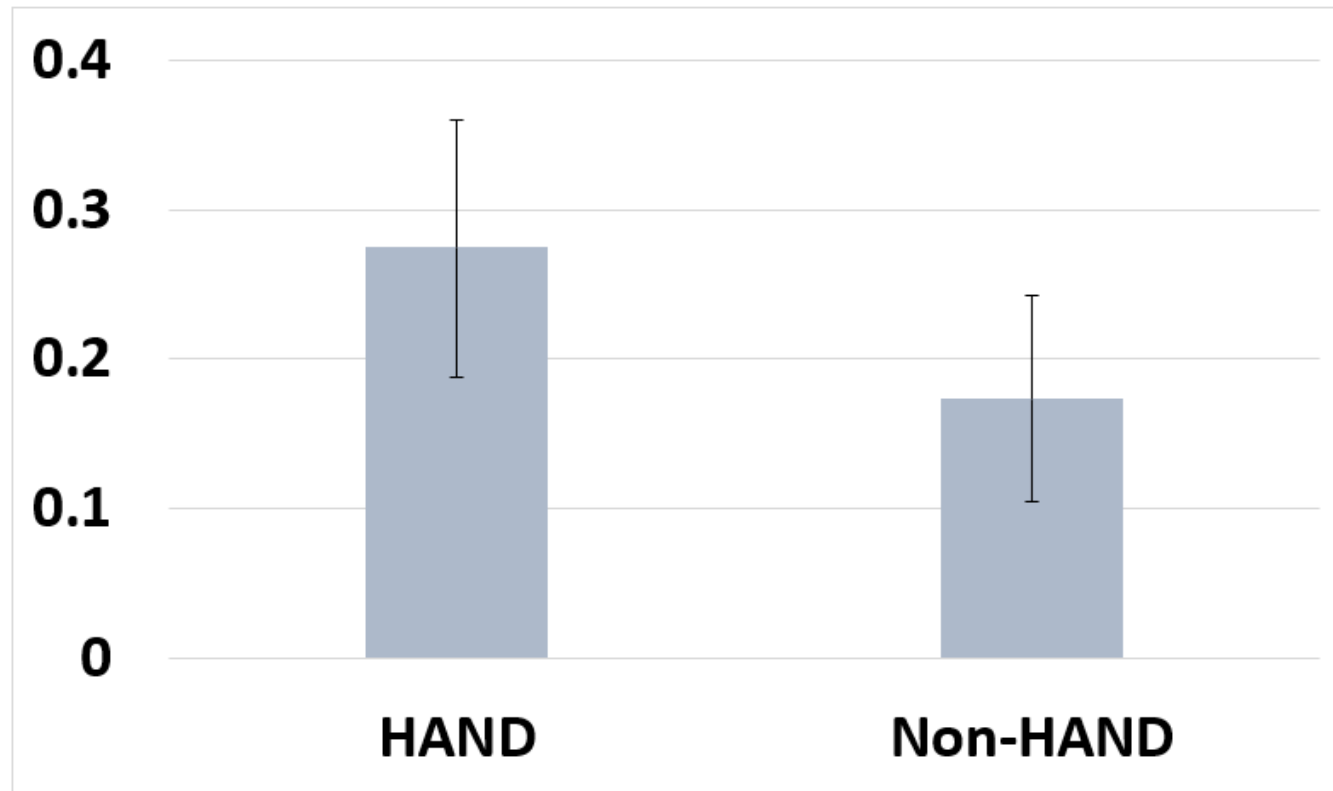
Individualized-Target Cognitive Training Does Not Reduce Cognitive IIV in Adults with HIV – Secondary Data Analysis

- **Objective:** Our study examined whether individualized-targeted cognitive training could reduce cognitive IIV in those with HAND.
- **Methods:**
 - HAND ($n = 108$) and Non-HAND ($n = 23$) participants completed a baseline neuropsychological assessment. Based on 6 neuropsychological tests scores, the coefficient of variation (CoV) served as the cognitive IIV coefficient.
 - HAND participants were randomized to either the Training ($n = 63$) or the No-Contact Control Group ($n = 45$). After completing a 12-week, 20-hour individualized targeted cognitive training protocol focused on two cognitive domains.



IIV Is Greater in HAND

Figure 1. Group CoV Differences at Baseline

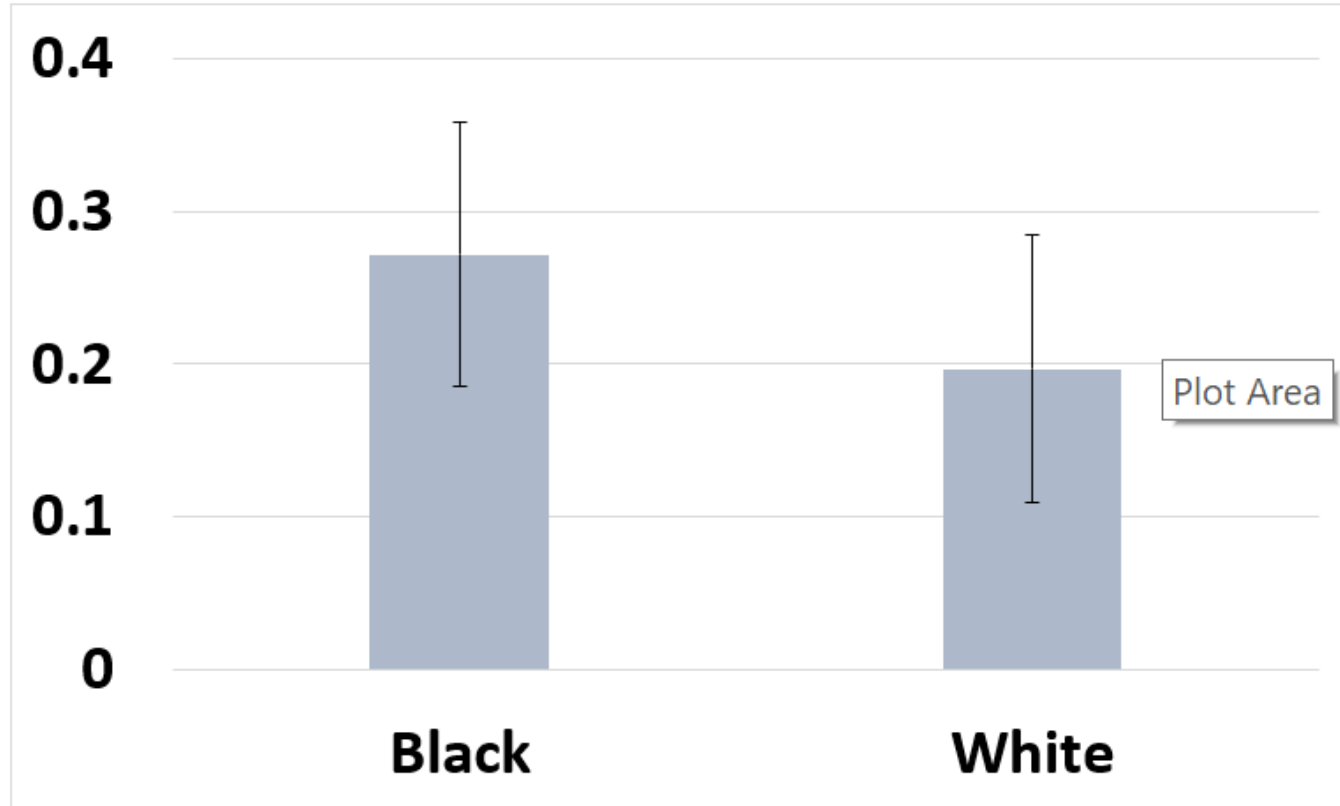


Notes. Errors bars are standard deviations CoV = Coefficient of Variation. HAND = HIV-Associated Neurocognitive Disorder.



Cognitive IIV Is Greater in Blacks with HAND

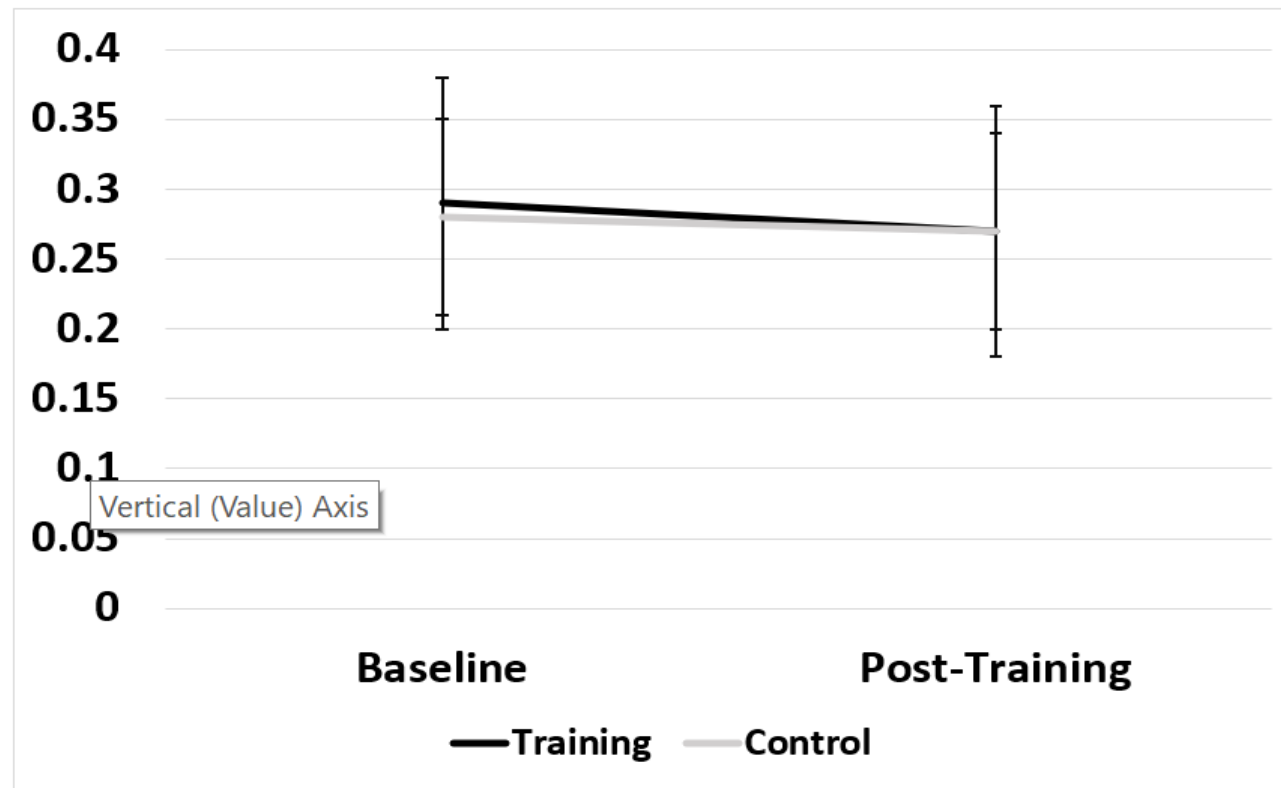
Figure 2. CoV Differences Between Black and White Participants with HAND



Notes. Errors bars are standard deviations CoV = Coefficient of Variation. HAND = HIV-Associated Neurocognitive Disorder.

Individualized-Targeted Cognitive Training Does Not Reduce Cognitive IIV in Adults with HAND: Secondary Data Analysis from R21

Figure 3. CoV in HAND Participants at Baseline and Post-Training



Notes. Errors bars are standard deviations. CoV = Coefficient of Variation. HAND = HIV-Associated Neurocognitive Disorder.



R21 – Executive Function Training to Reduce Cognitive Intra-Individual Variability in Adults with HIV

Aim 1 – Feasibility: To determine feasibility and acceptability of the intervention (i.e., attrition, feedback).

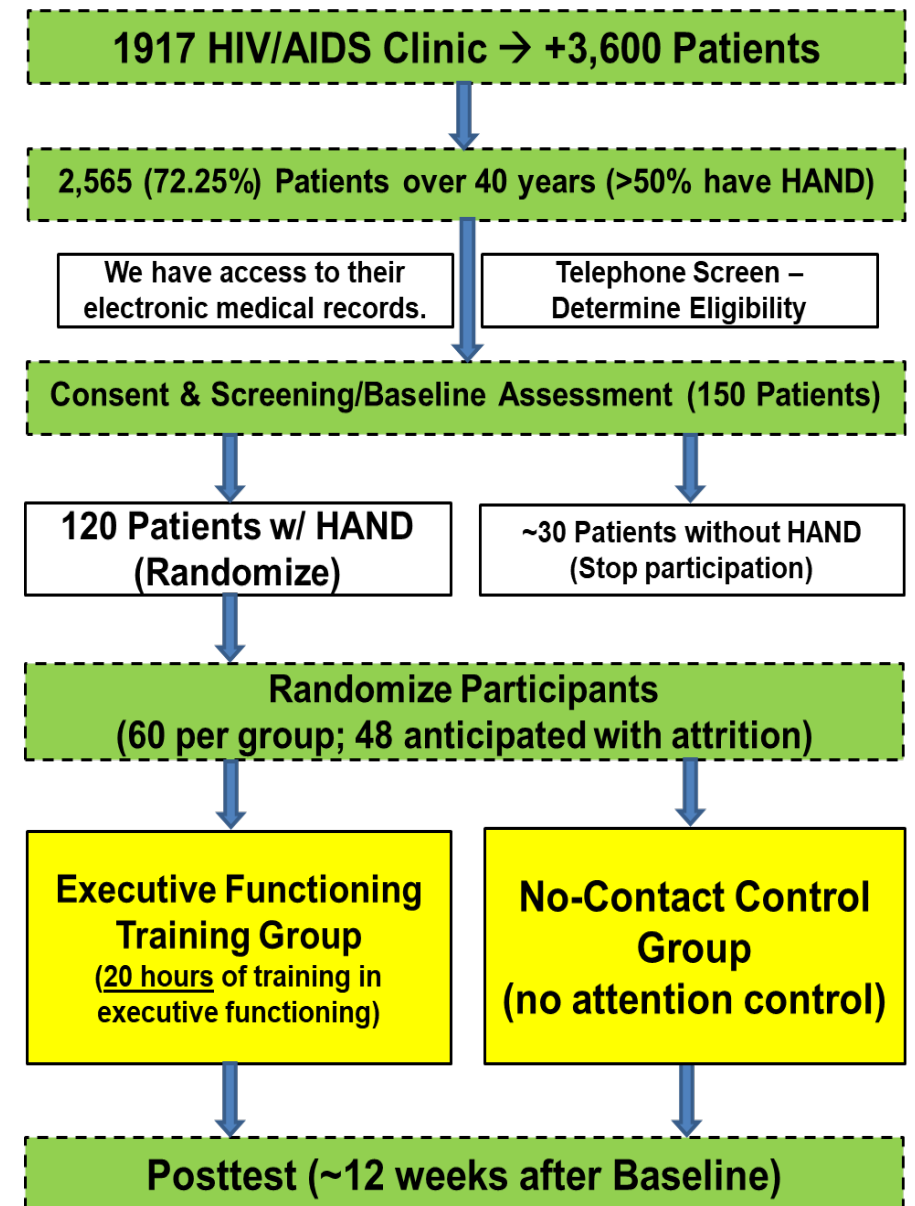
Exploratory Aim 1 – Cognition: Compare adults who receive Executive Functioning Training to those who receive no training to determine whether they improve in global cognitive ability and overall cognitive IIV.

Hypothesis 1: Executive functioning training will improve executive functioning.

Hypothesis 2: Executive functioning training will reduce the prevalence/severity of HAND.

Hypothesis 3: Executive functioning training will reduce cognitive IIV (dispersion & inconsistency).

Figure 3. Study Design



Ketogenic Diet in Older Adults with HAND

GOAL: Examine effects of a ketogenic diet on cognition in older PLHW with HAND

- 14 community-dwelling older adults with HIV (≥ 50 years)
- **Two Groups** (*random assignment*)
 1. Ketogenic diet group (**KGD**): ($n = 7$)
 2. Patient choice diet (**PCD**) ($n = 7$)

INTERVENTION

- **12-week diet intervention**
 - Eucaloric (*i.e.*, *weight maintaining*)
 - Energy requirements: *Harris-Benedict formula* (*activity factor of 1.35 x10%**)
 - Carb 43%; protein 20-25%; and fat 30-35%
 - Food selected from menu/weekly courier delivery
- **KGD:** Cognitive gains in the domains of executive function, speed of processing, attention, and visuospatial tracking
- **PCD:** Remained same or worsened
 - Anecdotal: TNF-a decreased in the KDG only
 - Tolerated well, no changes in cardiometabolic indicators

Ketogenic diet		Daily Nutrients	
Breakfast		KCAL	1800
Eggs, boiled	2 large	CARB (g)	36.4
Bacon, regular	4 slices	FIBER (g)	15.9
Butter, regular	5 g	NET CARB (g)	20.4
Almond milk, unsweetened	11 fluid ounces	FAT (g)	140
Coffee	8 fluid ounces	PROTEIN (g)	108
Half and half	3 containers (3 T)	% CARB	7.3
		% FAT	68.2
		% PROTEIN	24.4
Lunch			
Canned tuna	5 ounces		
Mayonnaise, regular	3 packages		
Walden Farms Ranch dressing	50 grams		
Tomato	5 cherry tomatoes		
Iceburg lettuce	1/4 head wedge		
Macadamia nuts	40 g		
Dinner			
Chicken breast	120 grams		
Olive oil	2 tablespoons		
Spinach, canned	8 ounces		
Squash, frozen	1 cup		
Butter, regular	10 g		



The cognitive effects of a ketogenic diet on HIV-associated neurocognitive impairment in an aging population: A pilot study. Morrison, S. A., Fazeli, P. L., Gower, B., Willig, A., Younger, J., Sneed, N. M., & Vance, D. E. (2020). The cognitive effects of a ketogenic diet on HIV-associated neurocognitive impairment in an aging population: A pilot study. *Journal of the Association of Nurses in AIDS Care*, 31(3), 312-324..

Engagement – Physical Exercise, Social, and Mental Activity

139 Adults with HIV ($M_{age} = 48.7$ years; 48% 50+)

Cross-sectional → Active Lifestyle & Neuropsychological Testing

- **Physical Exercise** – Any strenuous exercise in the past 72 hours? No (0)/Yes (1)
- **Social Engagement** – Lawton and Brody ADL Questionnaire
- “Frequently engage in or initiate social activity” No (0)/Yes (1)
- **Mental Activity** – Working full- or part-time? No (0)/Yes (1)
- **Active Lifestyle Factors (ALF)** ranged from 0 to 3
 - “Increasing number of ALFs was associated with a lower prevalence of HAND [$df = 1, \chi^2 = 5.1, p = .02$].”

ALF 0 – 63% HAND
(34% ANI, 18% MND,
11% HAD)

ALF 1 – 51% HAND
(35% ANI, 14% MND,
2% HAD)

ALF 2 – 33% HAND
(27% ANI, 3% MND, 3%
HAD)

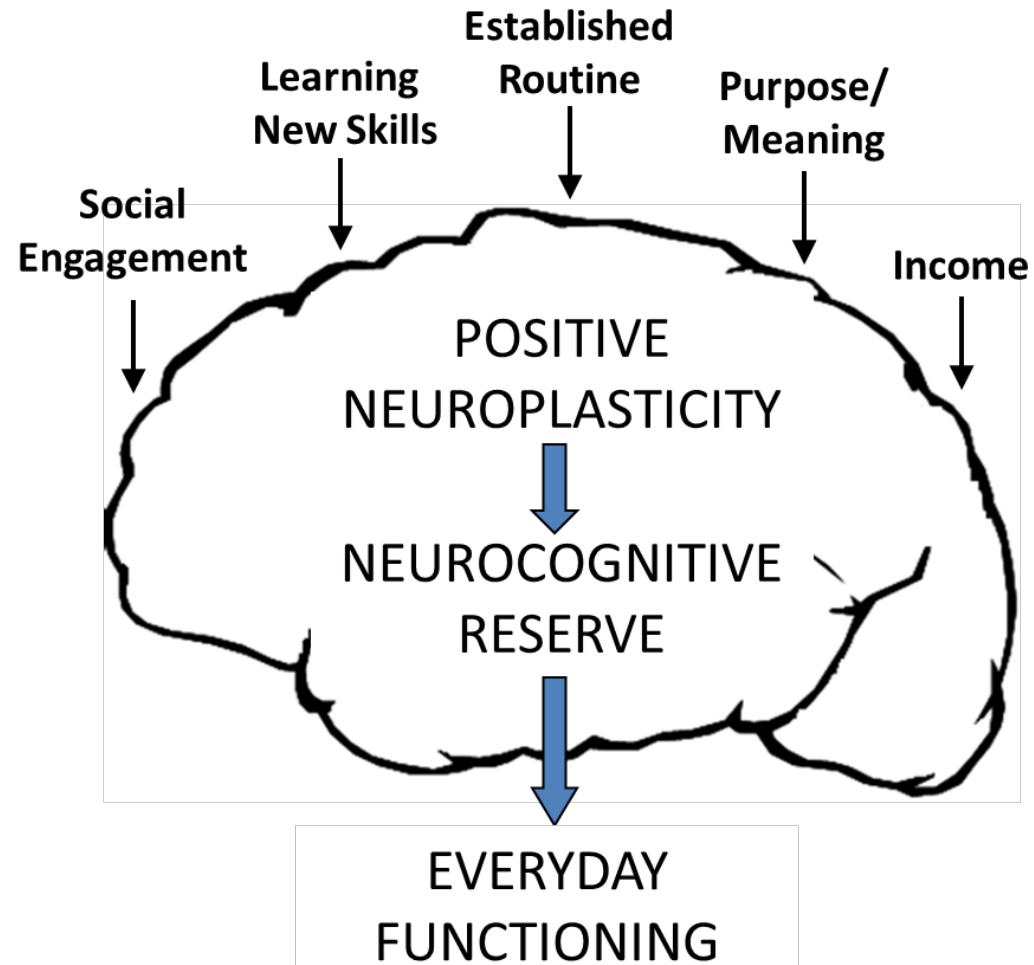
ALF 3 – 20% HAND
(15% ANI, 5% MND, 0%
HAD)



An active lifestyle is associated with better neurocognitive functioning in adults living with HIV infection. Fazeli, P. L., Woods, S. P., Heaton, R. K., Umlauf, A., Couaux, B., Rosario, D., ...The HNRP Group (2014). An active lifestyle is associated with better neurocognitive functioning in adults living with HIV infection. *Journal of Neurovirology*. DOI:10.1007/s13365-014-0240-z

Employment

According to one study, only **20%** of adults with HIV were continuously employed over a 30-month period (Rabkin et al., 2004)



The role of employment on neurocognitive reserve in adults with HIV: A review of the literature. Vance, D. E., Cody, S. L., Yoo-Jeong, M., Jones, G. D., & Nicholson, W. C. (2015). Journal of the Association of Nurses in AIDS Care, 26(4), 316-329. DOI: 10.1016/j.jana.2015.04.003

Engagement in Older Adults

Older adults ($N = 181$) were randomly assigned to control and experimental groups.

Experimental group: attended 20 weekly social meetings during which they worked in teams to develop creative solutions to problems

Control group: did not attend any social meetings

Compared to the control group, the experimental group who engaged in team problem-solving exhibited a positive change in neurocognitive ability from pretest to posttest.

Areas of improvement observed in the experimental group were processing speed, inductive reasoning, and divergent thinking.



Social Engagement



Neurocognition



The effects of an engaged lifestyle on cognitive vitality: A field experiment. Stine-Morrow, E. A., Parisi, J. M., Morrow, D. G., & Park, D. C. (2008). *Psychology and Aging*, 23(4), 778-786. doi:10.1037/a0014341

The Agewell Trails (Clare et al., 2015, BMC Psychiatry)

Goal: To change lifestyle factors to support successful cognitive aging and avoid dementia.

75 community-dwelling adults 50+ years old

3 Groups

Control (n = 27)

Goal Setting (n = 24)

Goal Setting with Mentoring (n = 24)








Goal setting focused on behavioral goals to improve health, nutrition, as well as cognitive, physical, and social activities to support neuroplasticity

Assessed over 12 months

Those in the goal setting groups improved on measures of executive functioning, memory, aerobic activity, cholesterol measures, balance, agility, flexibility, and grip strength.

Similar studies are being conducted as well to reduce the risk of Alzheimer's disease (Anstey et al., 2013, *Trials*).

Cognitive Prescriptions

Rx Cognitive Prescription 		
FACTORS	DO'S	DON'TS
Physical Exercise 	1. Go for a 30 minute walk every Tuesday and Thursday. 2. Stretch daily (e.g., arms, leg, neck, and back).	1. When you watch TV, don't sit on the couch during commercials; stretch instead.
Intellectual Exercise 	1. Read 1 book (>200 pages) a month. 2. Surf the World Wide Web everyday. 3. Start painting again; paint 1 picture a month.	1. Don't watch the same old TV shows over and over; watch something new occasionally (e.g., PBS, Discovery Channel, History Network).
Good Nutrition 	1. Eat more foods rich in antioxidants (e.g., blueberries, oranges, carrots); these are good for brain health. 2. Eat wild salmon and olive oil at least once a week; these are very good for brain health.	1. Avoid that second piece of cake (and that does not mean make the first piece bigger). 2. Avoid salt; this contributes to your hypertension. Hypertension is bad for brain health.
Sleep Hygiene 	1. Go to bed at a reasonable hour (between 10-11 pm). 2. Engaging in physical exercise will help you sleep better at night.	1. Avoid caffeine after dinner; it stays in your body for a long time and interferes with sleeping well. 2. Avoiding drinking more than 2 glasses of wine in the evening; this interfere with sleeping well.
Social Interaction 	1. Go out to dinner with friends at least twice a week. 2. Call your children every week.	1. Avoid being reclusive; socializing helps with not feeling lonely and depressed.
Good Mood 	1. Take your antidepressant as prescribed. 2. Watch funny shows to lighten your mood (e.g., I Love Lucy, M*A*S*H). 3. Use your positive words (e.g., I can do it; Anything is possible).	1. If you feel depressed, talk with a friend or go for a walk. 2. Don't dwell on what you can't do; focus on what you can do.

- 4 Focus Groups → 30 Older (50+) Adults with HIV
- Participants were presented ideas from the Cognitive Rx.
- “It would be easier for you if you sat down with someone and were able to target the things that were a little bit more important for you, whether that was you going to bike for physical exercise or eating certain things. You would want it tailored to what would be easiest for you.”



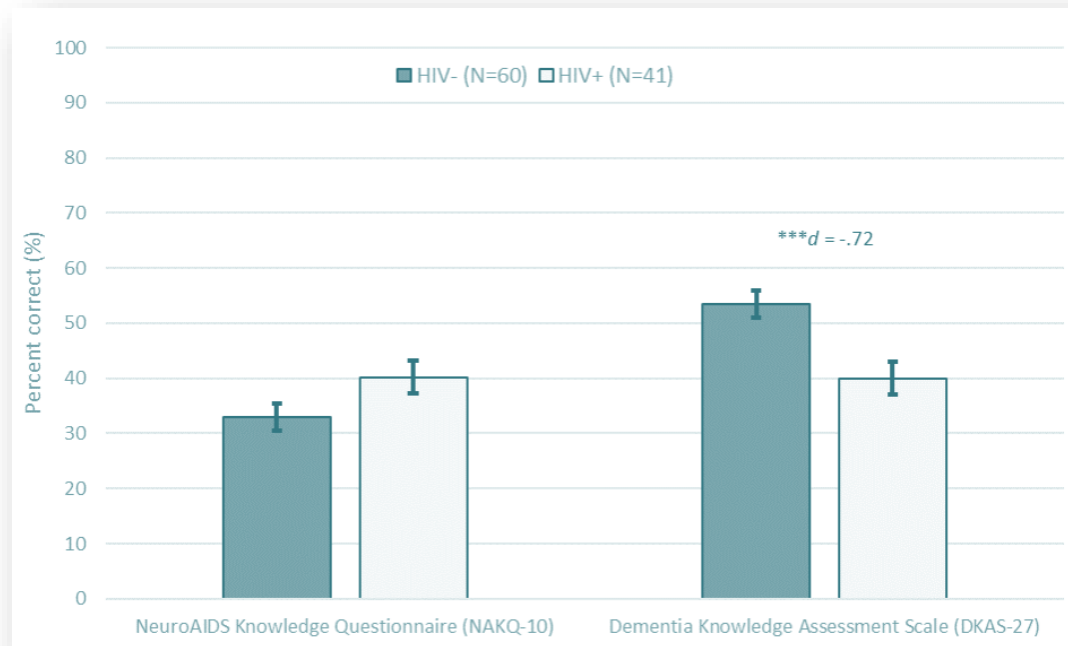
Cognitive prescription across the lifespan: A nursing approach to increasing cognitive reserve. Vance, D. E., Eagerton, G., Harnish, B., McKie-Bell, P., & Fazeli, P. (2011). *Journal of Gerontological Nursing*, 37(4), 22-29. DOI: 10.3928/00989134-20101202-03



Feedback on a multi-modal cognitive intervention for adults aging with HIV: A focus group study. Vance, D. E., Gakumo, C. A., Childs, G. D., Enah, C., & Fazeli, P. L. (2017). *Journal of the Association of Nurses in AIDS Care*, 28(5), 685-697. DOI: 10.1016/j.jana.2017.06.002

Dementia Knowledge in HIV

- PLWH who are aging are more vulnerable to cognitive decline and dementia.
- Cross-sectional study of 41 PLWH and 60 HIV- adults (51 ± 8 years)



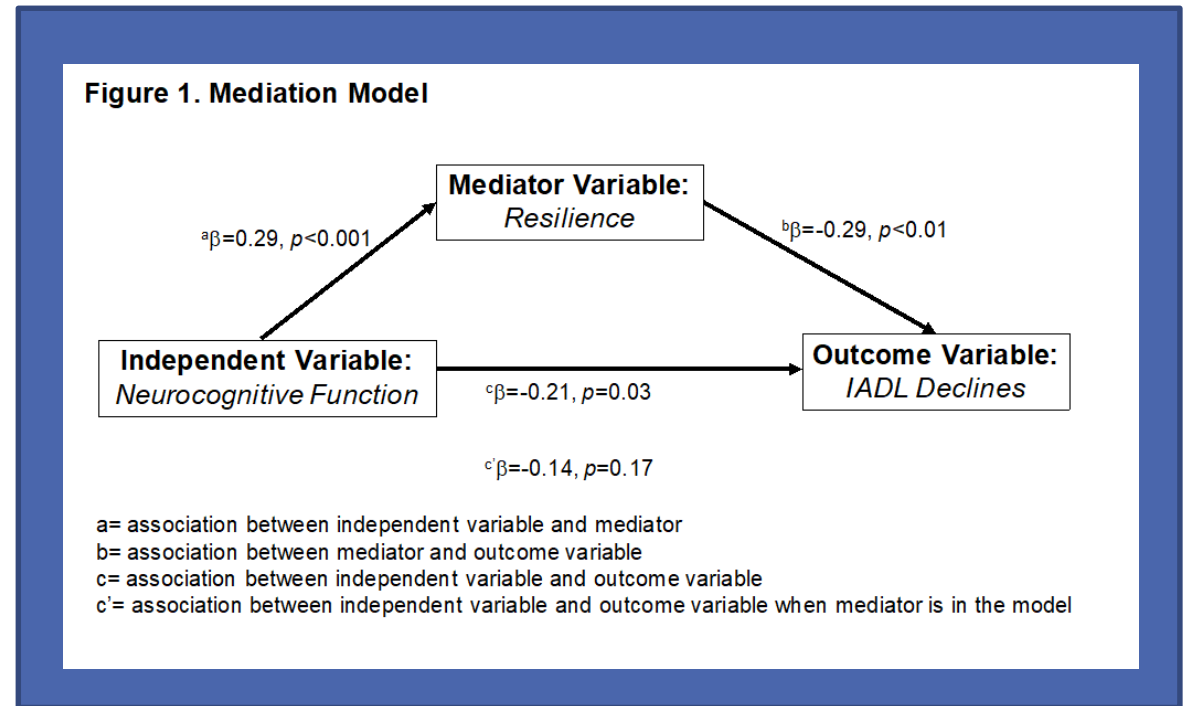
- Findings suggest that PLWH possess moderately low general dementia knowledge, and thus may benefit from psychoeducation about brain health.



Dementia knowledge is low in adults with HIV disease. Woods, S. P., Fazeli, P. L., Matchanova, A. M., Vance, D. E., Medina, L. D., & Morgan, E. E. (2020). *International Psychogeriatrics*, DOI: 10.1017/S104161021900139X

Resilience

- **Aim:** To explore the role of resilience in cognitive and everyday functioning in a largely African American and low socioeconomic status sample of adults and older adults with HIV
- **Cross-sectional Study:** 100 HIV+ middle-aged and older adults.



Higher resilience was associated with better global neurocognitive functioning ($\rho = 0.31$) and better functioning in most domains.

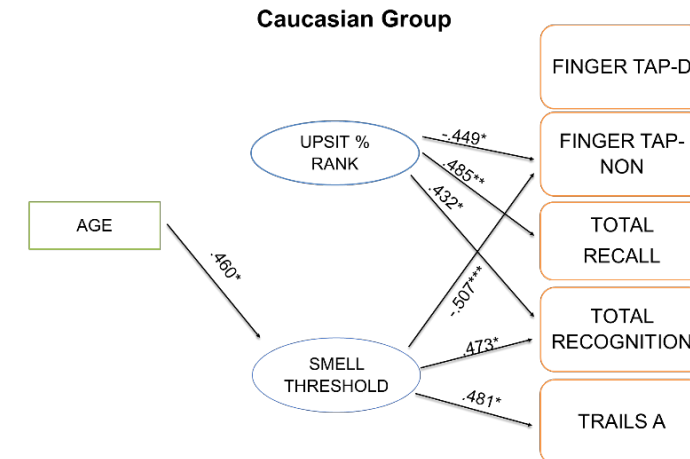
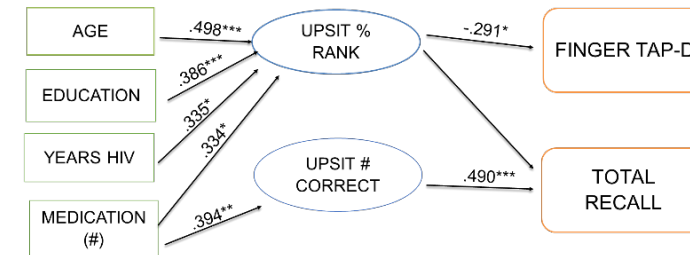
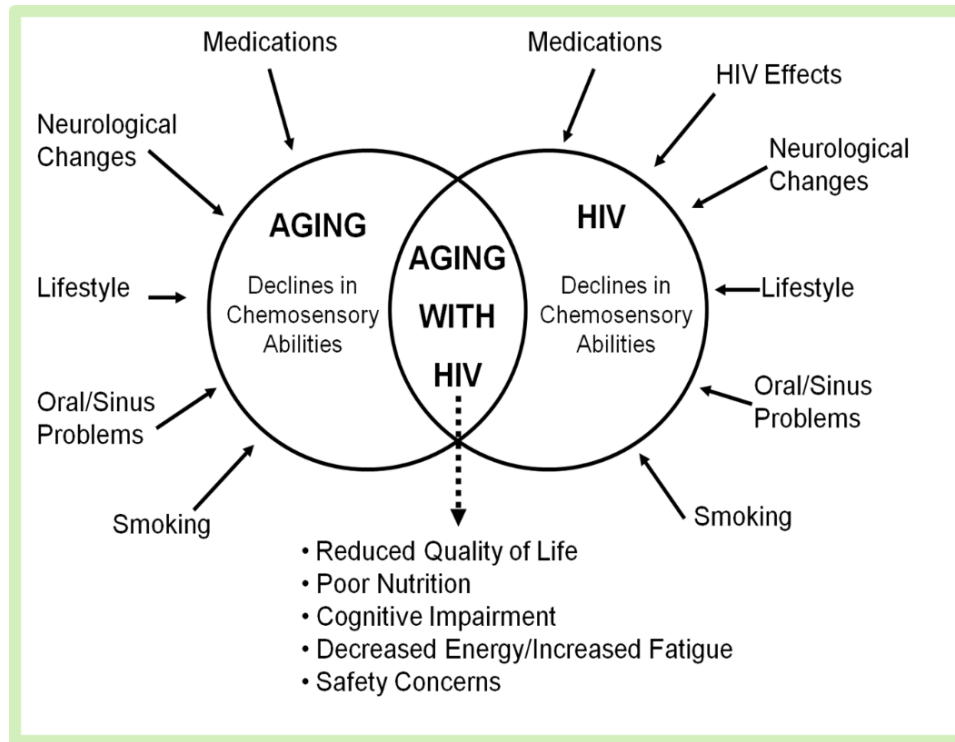


Resilience attenuates the association between neurocognitive functioning and IADL declines in people living with HIV in the Deep South. Fazeli, P. L., Moore, R. C., & Vance, D. E. (2019). *International Journal of Geriatric Psychiatry*, 34, 72-78. (DOI: 10.1002/gps.4988)

Olfaction and HIV: Olfactory Training?

34 African American Men & 17 Caucasian Men

- Ages 40 and older with HIV for at least one year (Mage = 54 years)



* = $p \leq .10$ ** = $p \leq .05$ *** = $p \leq .01$



The association between olfactory function and cognition in aging African American and Caucasian men with HIV: A pilot study. Vance, D. E., Cody, S. L., Nicholson, C., Cheatwood, J., Morrison, S., & Fazeli, P. L. (2019). *Journal of the Association of Nurses in AIDS Care*, 30(5), e144-e155. DOI: 10.1097/JNC.0000000000000086.



Olfactory dysfunction in aging African American and Caucasian men with HIV: A pilot study. Vance, D. E., Cody, S. L., Nicholson, C., Cheatwood, J., Morrison, S., & Fazeli, P. L. (in press). *Journal of the Association of Nurses in AIDS Care*.

Compensation Strategies



Low-Tech Suggestions

- **Medication Adherence** – Weekly pill box
- **Redundancies** – Keys, medications, etc.
- **Journaling** – Keeping track of events.
- **Driving Down the Road** – “I would be driving down the highway and suddenly be unable to remember where I was going or why. I still knew who I was and where I was and what I was doing, but clueless as to why....it is a frightening experience.”
 - **4 accidents in the two year prior to diagnosis which he was at-fault**
 - SOLUTION 1 → Post-It goes on the Dashboard Stating. ..Destination
 - SOLUTION 2 → Slow down, plan A to B, be more careful.



High-Tech Suggestions

- **Evernote (evernote.com) & Wunderlist (wunderlist.com)** – For keeping track of lists and reminders.
- **iCal** – The calendar that comes with the iPad.
- **30/30 App** – “Sense of timing is off.” It allows one to set a certain amount of time on a task, and then gives you an alert when time is up.
- **Check App** – Helps him keep up with bills, credit cards, and bank accounts.



HIV neurocognitive impairment and aging: Perspectives on neurocognitive reserve and behavioral remediation/compensation strategies. Vance, D. E., Nicholas, N., & Humphrey, S. C. (2015). *Austin Journal of Neuropsychiatry and Clinical Neurosciences*, 1(1): 1002.

Take Home Points

- ✓ **USE IT OR LOOSE IT!**
- ✓ That which is good for the body is good for the brain.
- ✓ Comorbidities, both physical and psychiatric, can impair cognition and cognitive reserve.

IT IS IMPORTANT TO ADHERE TO TREATMENTS TO PROTECT COGNITIVE RESERVE.



Take Home Points

Encourage patients to continue to pursue interests, especially if they are cognitively challenging.

Ask patients what they are doing to protect brain health

Empower patients to be proactive about brain health

The activity needs to make the brain sweat!!!

Start early to protect and preserve brain function

- Be on the lookout for new therapeutic strategies (e.g., brain fitness programs)
- Compensation strategies are available.



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Any Questions or Comments?



