

Understanding the latest in the science of successful brain aging

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 Bedford VA Healthcare System
 Assistant Professor of Neurology, BUSM
 Director of Research Education BU-ADRC

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Learning Objectives

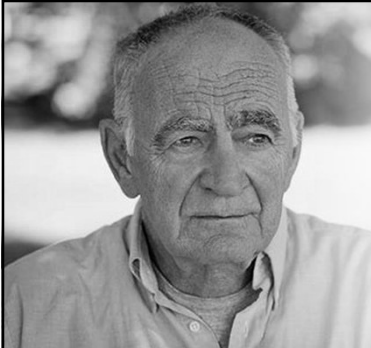
- Explain how the brain changes in normal aging
- Describe lifestyle factors associated with successful brain aging
- Discuss the role of memory strategies and compensatory techniques

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Outline

- A review of normal brain aging
- Lifestyle factors associated with successful brain aging
 - Sleep
 - Exercise
 - Diet
 - Brain games
 - Social functioning
 - The mind-brain connection
- Tips to strengthen memory
- Questions/Discussion

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- 64-year-old Veteran [Jim]
- Presents to clinic for concerns about worsening memory
- PMH: hypertension, hypercholesteremia, PTSD, poor sleep, chronic pain
- FMH: Mother with AD, died 84
- Complaining of word finding difficulties, names, walks into a room and forgets why, missed one appointment, ADLs intact
- Normal neuropsychological testing
- Feedback: explain brain aging, discuss lifestyle factors associated with successful brain aging, offer strategies

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Outline

- Understanding brain aging
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- Questions/Discussion

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What Happens When We All Live to 100?

If life-expectancy trends continue, that future may be near, transforming society in surprising and far-reaching ways.

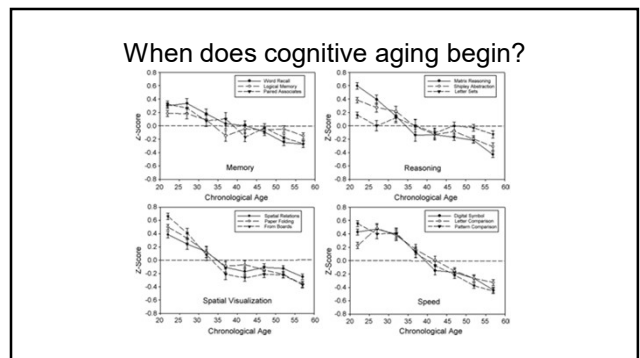
GREGG EASTERBROOK OCTOBER 2014 ISSUE

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Aging Veteran Population

- The Veteran population is roughly 20 years older compared to civilians (median age 64 vs 44)
- Projected growth in older Veterans over the next 5 years
- 10% of Veterans have dementia, expected 22% increase by 2033
- VA part of the National Age-Friendly Health System Initiative

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Structural and functional changes

- Declines in the size of the brain
- The frontal regions of the brain are most affected
- Hippocampus is also affected, but less so than in AD
- Integrity of white matter pathways
- Alterations in resting blood flow and brain oxygen consumption

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Cognitive declines in aging

- Processing speed
- Selective attention
- Divided attention
- Working memory
- Planning and self-initiation of strategic processing
- Episodic memory
- Retrieval
- Prospective memory

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Cognitive stability or improvement in aging

- Sustained attention
- Procedural memory
- Retention of information is relatively spared
- Semantic memory

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Changes misunderstood

- Media can make these changes even more concerning by creating hype:
 - “Epidemic looming”
 - “Dementia timebomb warning”
 - “Dementia crisis”



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Genetics: How much do they really tell us about who will age successfully?

- Heritability influences are greatest for individual differences in cognition, and this holds as we age
- BUT *change* in general cognitive ability in older age appears to be strongly determined by environmental factors

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Factors that influence cognitive aging

- Genetics
- **Sleep**
- **Exercise**
- **Diet**
- **Brain games**
- **Social stimulation**
- **Mind-brain connection**

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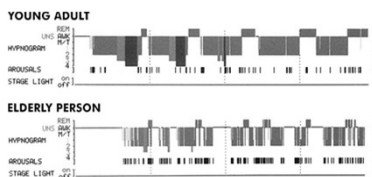
Sleep



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Normal Changes in Sleep That Occur With Age

- ✓ Decreased sleep efficiency
- ✓ Reduction in slow wave sleep

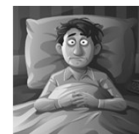


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Normal Changes in Sleep That Occur With Age

- ✓ Decreased sleep efficiency
- ✓ More difficulty initiating sleep
- ✓ More difficulty maintaining sleep
- ✓ Reduction in slow wave sleep (less "deep sleep")

- ✓ Increased prevalence of sleep disorders
- ✓ Insomnia (primary and secondary)
- ✓ Sleep Disordered Breathing



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Treatment of sleep problems in older adults

Sleep Hygiene Education

- Keep regular sleep/wake cycle
- Decrease or eliminate daytime naps
- Exercise regularly (but not before bedtime)
- Avoid heavy meals and liquids before bedtime
- Limit/eliminate alcohol, caffeine, nicotine before bedtime
- Relaxing bedtime routine
- Avoid distressing "pillow talk" with partner
- Don't use bed for reading or TV watching
- If unable to sleep, get out of bed and do something relaxing
- Make sure bedroom environment is conducive to sleep



Cognitive Behavioral Therapy for Insomnia

Medications

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Treatment of sleep disordered breathing in older adults

- ✓ CPAP

- ✓ Behavioral Treatment
 - ✓ Weight reduction
 - ✓ Changing sleeping position (side; golf balls, devices)
 - ✓ Smoking cessation
 - ✓ Reducing alcohol consumption

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Final thoughts about sleep problems and cognitive functioning in older adults...

- ✓ Some sleep changes are normal
- ✓ When these changes interfere with daytime functioning, they are considered to be a sleep disorder
- ✓ Sleep disturbance results in poor cognitive function
- ✓ Treatments are available for sleep-related problems and show promising results for improving sleep-related cognitive dysfunction, REFER!


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Exercise



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Exercise and cardiovascular health

- Exercise improves vascular health by positively impacting vascular risk factors including:
 - Heart disease
 - High blood pressure
 - Diabetes
 - Obesity
 - High cholesterol

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Exercise and physical health

- Reduces fall risk
- Reduces back pain and speeds recovery from back injuries
- Reduces muscle and joint pain than those who are inactive
- Improves sleep
- Maintain healthy weight



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Exercise and emotional health

- Improves mood
- Decreases anxiety
- Helps people cope with stress
- Can be a means of socialization
- Community based exercise programs decrease loneliness and social isolation
- Increase self-esteem
- Provides people with a sense of accomplishment

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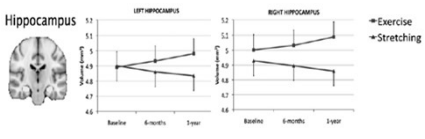
Exercise and cognitive health

- Increases capacity for learning
- Improves many cognitive functions (executive, episodic memory, visuospatial processing, global cognition, processing speed)
- Strengthens connections between existing brain cells, which allows it to work faster and more efficiently
- While there is no fail-proof way to prevent dementia, some studies suggest that those who exercise tend to develop Alzheimer's disease *less often* and *later* than those who are sedentary
- Spurs the growth of new neurons in the hippocampus...which keeps the brain growing. In fact, in patients with early Alzheimer's disease, one study found that those who were less physically fit had four times more brain shrinkage than those who were more physically fit!

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Exercise increases hippocampal volume in older adults

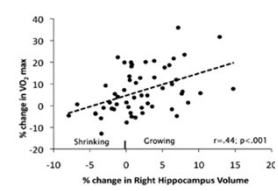
- 120 older adults 55-80, mean 66 years
- Randomized to 1 yr of exercise vs stretching



PNAS | February 15, 2011 | vol. 108 | no. 7 | 3017-3022

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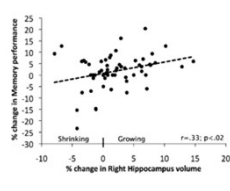
VO₂ max (cardiorespiratory fitness) correlates with hippocampal volume



PNAS | February 15, 2011 | vol. 108 | no. 7 | 3017-3022

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memory performance correlates with hippocampal volume



PNAS | February 15, 2011 | vol. 108 | no. 7 | 3017-3022

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Older adults exercise habits

The sad truth...

•It is estimated that 1/3 of people over the age of 75 engage in NO leisure-time physical activity at all!

•Less than 15% of older adults engage in *consistent* physical activity (5 times per week, 30 minutes per session).

•Why?

- Health
- Environment (safety and proximity to facilities)
- Physician Advice
- Knowledge

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Recommendations

- Cardiovascular: CDC 150 minutes a week (30 minutes 5 days a week)
- Appears to have a dose-response relationship
- Can be broken up if needed
- 2 days of strength training and flexibility
- Just a starting point

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Gerofit - Supervised exercise program for Veterans



Gerofit Program Coordinator Jimmy Mullin, Recreation Therapist, at Northport VA Medical Center leads Veterans during a group Gerofit exercise class that is designed as an individual and group exercise program for veterans. Gerofit strives to improve participants' balance, endurance and strength while building a sense of community.

What is MOVE! MOVE! is a weight management, health promotion program designed to improve the health of Veterans. MOVE!'s core focus... encouraging healthy eating behavior, increasing physical activity, and providing stress management resources are easy to follow and based on the latest in medical science. With the help of your MOVE! care team, you can reduce health risks, prevent or reverse certain diseases, improve your quality of life, and even live longer!

If you would like to learn more about how MOVE! has helped thousands of Veterans achieve these goals, make sure to read our MOVE! Success Stories.



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Gerofit - A Program Promoting Exercise and Health for Older Veterans - Geriatrics and Extended Care (va.gov)



What is Gerofit?

Gerofit is an exercise program that promotes health & wellness for Veterans. Participants in the program have demonstrated improved health, mental, physical function and well-being. Gerofit is a great way for Veterans to stay active by using a variety of strength and aerobic exercises. Also, by participating in group classes like tai chi, dancing, walking, and balance. For those who don't live near an available Gerofit site, click on the Gerofit Resources and the How do I join? tabs to find out how we can help.

All veterans are given a personalized exercise prescription and guidance in carrying out the exercise program is provided by trained exercise staff such as a physiologists, nurses or physical therapists. Starting in Durham in 1996, the program is now offered at 30 different VA Healthcare Systems around the country. For a list of locations click on the Gerofit Locations tab.

Video about Gerofit



"It's a benefit not only to my physical health but also my mental as well. I attribute a lot of that to my continual workouts here at Gerofit."

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MOVE! Weight Management Program Home (va.gov)

MOVE! Weight Management Program

- HOME
- MOVE! Q & A
- MOVE! Success Stories
- MOVE!11
- MOVE! Coach
- Veteran Workbook
- Video Gallery
- Viewer Software
- Health Promotion and Disease Prevention



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Making the Most of the "Doing"

VETERAN TOM ROBERTS TOOK ACTION TO ACHIEVE BETTER HEALTH WITH MOVE!

Tom worked with the MOVE! team at the VA Sioux Falls Health Care System in Dakota Dunes, SD, to learn and adopt new healthy lifestyle habits and improve his health.



A Strong Beginning

Before joining the MOVE! Weight Management Program for Veterans, Tom struggled with his weight for many years. Though he describes himself as an active child, for most of this life he found himself gaining weight. Tom was always conscious of the effect his weight had on his health, but as years passed and he developed diabetes he became more concerned. In July 2018, he decided to make a change and followed his provider's recommendation to begin participating in MOVE!.

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Diet



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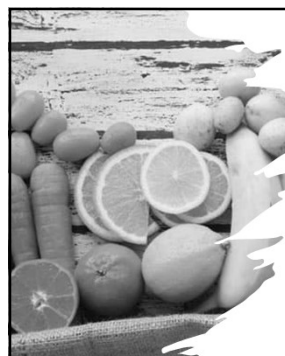
There is no single “super food” that has been shown to improve brain health.



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Eating for brain health

- Vitamin D
- B vitamins
- Omega-3 fatty acids
 - fish (particularly fatty fish like salmon and tuna), walnuts, green leafy vegetables like kale, flaxseeds and flaxseed oil – many foods are also being fortified w/ omega 3s (eggs, milk, juice, yogurt).
- Antioxidants
 - Vitamins A, C, E
 - From food, little research supplements help
 - High intake in the form of supplements may increase risk of cancer, death, and interact with other medications.
 - “Color-diet”
- No evidence for fish oil or coconut oil



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CHASING LIFE

WITH DR. SANJAY GUPTA

Mediterranean diet named the best for 2019

By Sandee LaMotte, CNN

Updated at 9:31 AM ET, Wed January 2, 2019



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Mediterranean diet

- Most well-studies, strongest results
- High consumption of fruits, whole grains, beans, vegetables at every meal
- Low in saturated fats, but encourages consumption of “good fats” – olive oil, avocado, nuts
- Fish at least twice a week
- Low to moderate yogurt and cheese
- Red meat and sugar sparingly
- Encourages eating with family and friends



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Mediterranean diet improves cognitive function vs. control diet

- 334 cognitively healthy adults
- Mean age 67 years
- Randomly assigned
 - Med diet + olive oil
 - Med diet + nuts
 - Control
- Fish, olive oil, avocado, fruit, vegetables, beans, nuts, whole grains, red wine

From: **Mediterranean Diet and Age-Related Cognitive Decline: A Randomized Clinical Trial**
 JAMA Intern Med. 2015;175(7):1094-1103. doi:10.1001/jamainternmed.2015.1668

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Neurology | [neurology](https://doi.org/10.1212/WNL.00000000000012067)

Neurology 2021; June 15; 96(24):4290-4292
 doi: 10.1212/WNL.00000000000012067

PAGE: P4292-4296
 PMID: 3352552

Mediterranean Diet, Alzheimer Disease Biomarkers, and Brain Atrophy in Old Age

Tommaso Ballarín, PhD,¹ Daniela Mills van Lier, PhD, Julia Brunner, MSc, Alina Schröder, MSc, Stefan Wolfgartner, PhD, Steven Albertson, Dep Psych, Psychiat, Biostatist, PhD, Katharina Buerger, MD, Peter DeCarli, PhD, Laura Dobbins, MSc, Emma Clode, MD, Brigit Erb-Strauss, MD, Klaus Fennrich, MD, Silke Damm-Farnbacher, MSc, Fritz Fennrich, Dep Psych, Weizel Clinic, MD, Dietmar Fritzer, Dep Psych, John Dylan Hansen, PhD, Michael J. Heneka, MD, Daniel Jelic, MD, Ina Kivimaki, MD, Christoph Lemke, MD, Francesco Masi, MD, Corinne Oberholzer, MD, Matthias H. Maurer, MD, Robert Perneczky, MD, Oliver Pitzer, MD, Josef Prineas, MD, Alfredo Ramirez, MD, Boris Stephan-Haackenberg, MD, Vera Strassl, PhD, Klaus Sathoff, PhD, Axel Schneider, MD, Nicola Scattini, MD, Elin-Johanna Smith, MD, Stefan J. Teipel, MD, Ruth Uehlein, MD, Jens Wittens, MD, Frank Jessen, MD, Michael Wagner, PhD, and on behalf of the DELCODE Study Group

Figure 1

Public Association Between MCI and Brain Volume

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What about alcohol?

- FDA 1 drink or less women, 2 or less men, BUT
- 1 drink a day over 65 for all
- Continue if no problem, don't start just for aging
- Newest research suggests none is best

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Brain games

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Brain training programs

- No evidence these work
- People may *feel* better and get better at the game, but no generalization shown
- Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) trial
- FTC recently fined some companies for making unfounded claims that their products improve brain health
- Our recommendation: Save your money and time and invest in other types of activities

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Social Functioning

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Threats to socialization

- Role loss
 - Widowhood
 - Loss of friends
 - Retirement
- Living alone
 - Seniors are the age group most likely to live alone
 - 28% Americans over age 65 live alone
- Poverty
 - Those living below the poverty line most likely to be isolated
 - Less access to social venues, transportation
 - Fewer community resources
- Baby boomers
 - Lower rates of marriage
 - Higher rates of divorce
 - Fewer children
- Veterans
 - Geographical mobility, less opportunity to "put roots down"
 - Higher rates of PTSD, MHC interfere with socialization

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The benefits of social activity

Decreased risk of:

- ✓ Mortality
- ✓ Depression
- ✓ Cognitive decline
- ✓ Dementia

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Late life social activity and cognitive decline

- 1138, no dementia
- M=79.6 (SD = 7.5)
- followed up to 12yrs
- SA associated with higher baseline cognition and reduced rate decline
- Rate of decline average of 70% less in frequently SA compared to infrequently SA

James, B. D., Wilson, R. S., Barnes, L. L., & Bennett, D. A. (2011). Late-life social activity and cognitive decline in old age. *Journal of the International Neuropsychological Society*. JINS, 17(6), 998-1005. <https://doi.org/10.1017/S135561711000311>

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Increase Socialization



- ❖ Recreational therapists
- ❖ Volunteering
- ❖ Community organizations
- ❖ Coffee/Voices Socials
- ❖ Compassionate Contact Corps

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- [Veterans Coffee Socials - Fostering Community Connections - Mental Health \(va.gov\)](https://www.va.gov/vetaffairs/mentalhealth/cohorts/)
- Numerous downloadable assets: worksheet to determine location, overcome barriers, create a flyer

Resources

[Quick Start Guide for Veterans Coffee Socials](#)

Download this quick start guide if you're interested in setting up and hosting a Social near you. The guide explains how to start a group, how to reach Veterans in your area, and how to ensure that your Social is successful in fostering connections among Veterans and others in their community.

> Community Ment Health J. 2018 Nov;54(8):1189-1197. doi: 10.1007/s10597-018-0288-y. Epub 2018 Jun 13.

Veteran Coffee Socials: A Community-Building Strategy for Enhancing Community Reintegration of Veterans


Jay A Gorman¹, Aletta A J Scoggin², John Smolinsky³, Anthony Russo⁴, Charles E Drelbing⁵

ABSTRACT expand
PMID: 29948629 DOI: 10.1007/s10597-018-0288-y

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Socials - Links and Contact

- **Webpage on the mental health VA site (quick-start guide for communities):**
[Veterans Socials - Fostering Community Connections - Mental Health \(va.gov\)](https://www.va.gov/vetaffairs/mentalhealth/cohorts/)
- **VA News Blog:**
[VOICES – Veteran outreach in the community expands social support - Vantage Point](#)
- **YouTube Explainer Video:**
<https://youtu.be/8FvDzNhw0IM>
- **VHA Innovation Ecosystem Diffusion Market Place:**
<https://marketplace.va.gov/innovations/veteran-outreach-into-the-community-to-expand-social-support>
- If you have any questions, email: vhabledvoices@va.gov



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Socials - Guidance



Quick Start Guide
for Veterans Coffee Socials


VOICES Guidebook
for Veterans Coffee Socials

You Can Start a Social Group for Veterans

VhabledVOICES@va.gov

<https://www.mentalhealth.va.gov/socials>

Veterans Coffee Socials
Building social support systems with Veterans in the community is an important part of ensuring Veterans' overall health. Veterans Coffee Socials enhance communication and foster bonds among Veterans and others in the community. They are a place to meet friends, get resources, and have fun with other Veterans and community members. These Socials come in many forms, and we encourage hosts to shape them based on attendees' needs and preferences.



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Compassionate Contact Corps



About the Program

The Compassionate Contact Corps is a virtual social prescription program where trained volunteers are matched with Veterans that are experiencing loneliness or are socially isolated. The volunteer typically calls the Veteran weekly for 15–20 minutes to provide socialization and companionship via phone or video calls. Many volunteers come from Veterans service organizations and are Veterans themselves, but that is not a requirement to volunteer for the program.

Compassionate Contact Corps - VA Center for Development and Civic Engagement

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The Mind-Brain Connection

The Importance of
Mental
Mindset



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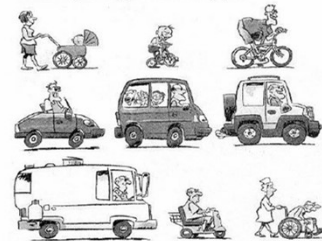
Mental mindset

Attitude is a little thing that makes a big difference. ~Winston Churchill



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The Wheels of Life



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"OH, GETTING OLD ISN'T SO BAD, EXCEPT MAYBE FOR A LITTLE FORGETFULNESS."

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Older adults self-perceptions

- Believe they will do less well on memory tasks
 - Feel their memory will worsen with age
 - Report less control over their memory
-
- Negative beliefs about memory tend to worsen with age

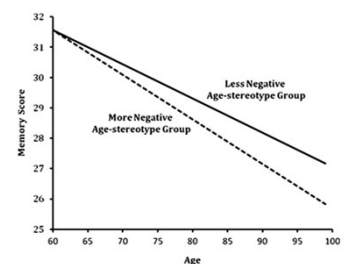
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Eliciting Stereotypes in the lab

- Decrepit
- Senile
- Decline
- Dementia
- Wise
- Accomplished
- Sage
- Guidance

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Effect of age-stereotype groups on older individuals' memory over time.



Loary B R et al. J Gerontol B Psychol Sci Soc Sci 2011;geronb.gbr120
 © The Author 2011. Published by Oxford University Press on behalf of The Gerontological Society of America. All rights reserved. For permissions, please write: journals.permissions@oup.com
 the journals of gerontology series B

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Longevity and perceptions of aging

Older adults with more positive views about aging live longer!



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Can be changed!

- Increase awareness of age stereotypes among older adults
- Programs that provide opportunities for younger people to interact with and learn from older adults

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Memory Strategies/Cognitive Rehabilitation

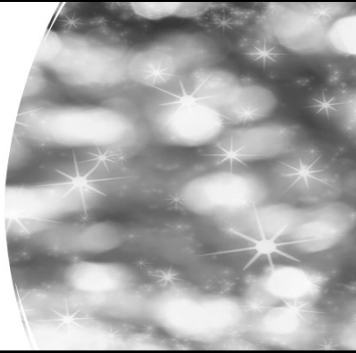
- Practice Active Attention (Mindfulness)
- Repeat information spaced out over time
- Make Connections
- Create Visual images
- Remembering Lists by Location
- Invent Rhymes
- Retrieve the name
- Learn new names



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Memory Aids: 3 Golden Rules


- Don't delay
- Keep it simple
- Make it routine



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Memory Aids

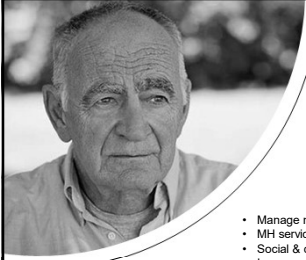
- Memory table (or tray or bowl)
- Pillbox
- Calendars & planners
- Notebooks
- Lists
- Reminder notes
- Smartphones & technology
- Memory aids are for everyone!



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- 64-year-old Veteran [Jim]
- Presents to clinic for concerns about worsening memory
- PMH: hypertension, hypercholesterolemia, PTSD, poor sleep, chronic pain
- FMH: Mother with AD, died 84
- Complaining of word finding difficulties, names, walks into a room and forgets why, missed one appointment, ADLs intact
- Normal neuropsychological testing
- Feedback: explain brain aging, discuss lifestyle factors associated with successful brain aging, offer strategies

- Manage medical conditions (role of diet, exercise)
- MH services
- Social & cognitive engagement, meaning and purpose in life
- Improve sleep: sleep study, CBT-I, sleep clinic
- Pain management
- Cognitive rehabilitation program/cognitive tips: using a calendar, alarms, strategies for learning names
- Follow over time with cognitive screening/refer to NP

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Original Article

The Aging Well through Interaction and Scientific Education (AgeWISE) Program

Maureen K. O'Connor, Malissa L. Kraft, Ryan Daley, Michael A. Sugarman, Erika L. Clark, Arielle A.J. Scoglio & ...show all

Pages 412-423 | Accepted author version posted online: 02 Nov 2017; Published online: 08 Dec 2017

Download citation: <https://doi.org/10.1080/07317171.2017.1387212>

In this article

- ABSTRACT
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- Clinical implications
- Supplemental material
- Additional information
- References

Object

Educational program

Psychological aging

Mathematics program

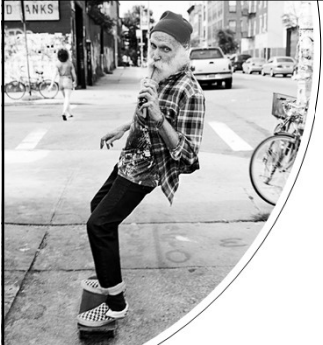
Activities

Supplemental material

The_Aging_Well_through_Interaction_and_Scientific_Education.docx

Download MS Word (223 KB)

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Thank you!

Questions?

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