Understanding the latest in the science of successful brain aging

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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

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

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

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• Understanding brain aging
• Lifestyle factors associated with successful aging
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• Strengthen your memory
• Questions/Discussion
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.

When does cognitive aging begin?

- 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.

Cognitive declines in aging

- Processing speed.
- Selective attention.
- Divided attention.
- Working memory.
- Planning and self-initiation of strategic processing.
- Episodic memory.
- Retrieval.
- Prospective memory.
Cognitive stability or improvement in aging

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

Changes misunderstood

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

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
Factors that influence cognitive aging

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

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Normal Changes in Sleep That Occur With Age

- Decreased sleep efficiency
- Reduction in slow wave sleep

Sleep

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

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

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

Exercise and cardiovascular health

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

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

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 fool-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!

Exercise increases hippocampal volume in older adults

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

VO₂ max (cardiorespiratory fitness) correlates with hippocampal volume

Memory performance correlates with hippocampal volume
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

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

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

What is Gerofit?
Gerofit is a comprehensive physical activity and health promotion program. Participants of the program have demonstrated improved health, reduced risk of physical and functional disability, and better mental health.

Gerofit is a great way for veterans to stay active by adding leisure and physical activity to their daily routine. Gerofit includes a variety of options, like walking, water aerobics, and strength training.

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

What is MOVE?
MOVE is a program designed to promote physical activity and reduce the risk of chronic diseases in older adults. It includes a variety of activities, such as walking, strength training, and balance exercises.

MOVE is for everyone, regardless of age or physical ability.

MOVE! Weight Management Program

Home (va.gov)

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Diet

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

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

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
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

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

- 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

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

The benefits of social activity

Decreased risk of:

- Mortality
- Depression
- Cognitive decline
- Dementia

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
Increase Socialization

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

- Veterans Coffee Socials - Fostering Community Connections - Mental Health (va.gov)
- Numerous downloadable assets: worksheet to determine location, overcome barriers, create a flyer

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)
- VA News Blog: VOICES – Veteran outreach in the community expands social support - VAntage Point
- YouTube Explainer Video: https://youtu.be/8EvDzNhv0iM
- If you have any questions, email: vhbedvoices@va.gov

Socials - Guidance

- Veterans Coffee Socials: A Community-Building Strategy for Enhancing Community Reintegration of Veterans
- Numerous downloadable assets: worksheet to determine location, overcome barriers, create a flyer
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The Mind-Brain Connection

The Importance of Mental Mindset

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

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
Eliciting Stereotypes in the lab

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

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


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Longevity and perceptions of aging

Older adults with more positive views about aging live longer!

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
Memory Aids: 3 Golden Rules

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

Memory Aids

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