

Cognitive Training for Older Adults: Does it Work?

@Health_AIR

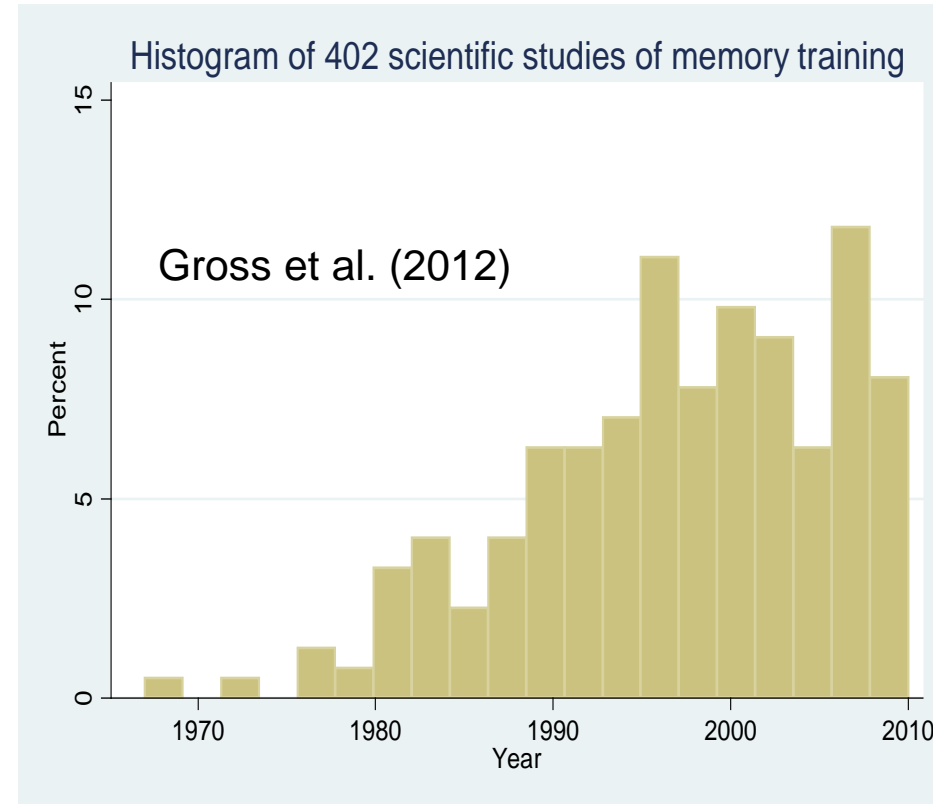
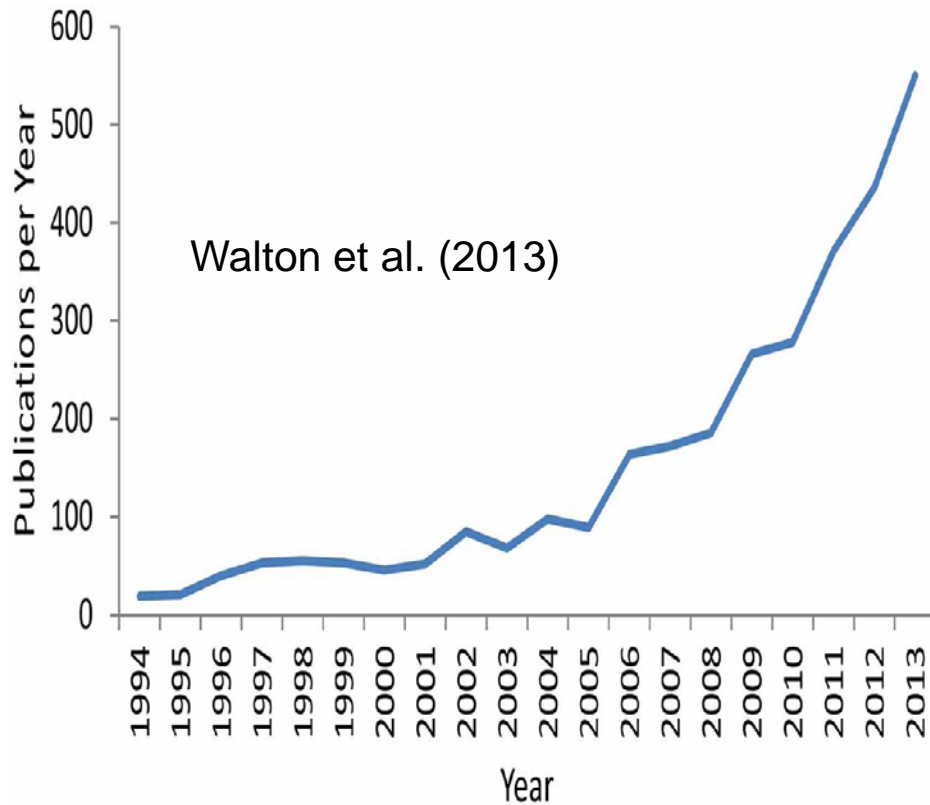
#AIRAging

George W. Rebok, PhD, MA

Institute Fellow

Senior Advisor, Center on Aging | Co-Director, Project Talent

Cognitive training: Growth of the field



What is cognitive training?

- Guided practice on set of tasks related to memory, attention or other brain functions
- Uses repetitive exercises for a cognitive ability (e.g., memory) or multiple abilities (e.g. memory and reasoning)
- May be computer-assisted or delivered in person to an individual or small groups
- Based on idea brain can change for the better
- Not just puzzles or “brain games”

Why cognitive training is important

- 65+ population is growing
 - 20% (72 million) of population by 2030
- Cognitive decline is most feared aspect of growing older
- Drug trial results are disappointing
- Cognitive impairments heavily affect aging population
 - 1 in 4 adults 70 years or older have an impairment without dementia
 - About 5.3 million people in the U.S. have Alzheimer's disease

Does cognitive training work?

- Simple answer: Yes. Numerous research trials show immediate benefits
- But questions remain about the practical impact of these benefits on important everyday life tasks (such as medication management, health and financial decision making) and how long effects last
- Other questions: Does it have potential to “cure” or prevent Alzheimer’s disease or help dementia patients?

A Consensus on the Brain Training Industry from the Scientific Community



Max-Planck-Institut für Bildungsforschung
Max Planck Institute for Human Development



October 20, 2014

In summary: We object to the claim that brain games offer consumers a scientifically grounded avenue to reduce or reverse cognitive decline when there is no compelling scientific evidence to date that they do. The promise of a magic bullet detracts from the best evidence to date, which is that cognitive health in old age reflects the long-term effects of healthy, engaged lifestyles. In the judgment of the signatories, exaggerated and misleading claims exploit the anxiety of older adults about impending cognitive decline. We encourage continued careful research and validation in this field.

The main issues

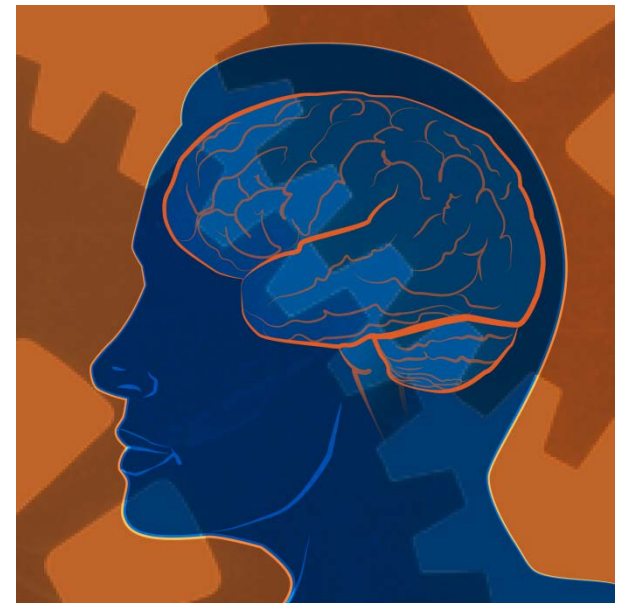
Identifying conditions leading to “transfer” of cognitive training to everyday tasks

Maximizing gains from cognitive training that will be sustained over time

Determining the optimal dose/frequency of cognitive training and what is responsible for training-related benefits

Improving accessibility or “reach”

Adapting cognitive training to individual needs, abilities and motivations, and making it more culturally appropriate



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Next up: Michelle C. Carlson

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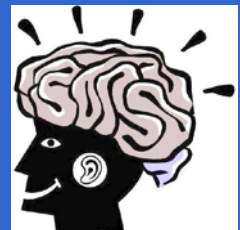
Moving from Brain Training to Small Increases in Daily Cognitive, Physical and Social Activity

Michelle C. Carlson, PhD

Department of Mental Health, Center on Aging and Health
Johns Hopkins Bloomberg School of Public Health

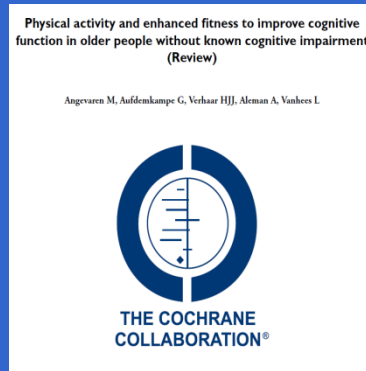
June 3, 2015

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Neurocognitive benefits of Physical Activity

- Better cognitive function



- Reduced risk for dementia



- Better brain health

Proceedings of the National Academy of Sciences of the United States of America

Cardiovascular fitness, cortical plasticity, and aging

Stanley J. Colcombe^{1*}, Arthur F. Kramer^{1,15}, Kirk I. Erickson^{1,15}, Paige Scalf^{1,15}, Edward McAuley¹, Neal J. Cohen^{1,15}, Andrew Webb¹, Gerry J. Jerome², David X. Marquez², and Steriani Elavsky³

*The Beckman Institute, ¹Neuroscience Program, and Departments of ²Psychology, ³Kinesiology, and ⁴Electrical and Chemical Engineering, University of Illinois at Urbana-Champaign, Urbana, IL 61801

Proceedings of the National Academy of Sciences of the United States of America

PNAS

Exercise training increases size of hippocampus and improves memory

Kirk I. Erickson¹, Michelle W. Voss^{2,3,4}, Rudhika Shaurya Prakash¹, Chandramallika Basak¹, Amanda Szabo¹, Laura Chaddock^{5,6}, Jennifer S. Kim⁶, Susie Heo^{2,3,4}, Heloisa Alves^{2,3,4}, Siobhan M. White¹, Thomas R. Wojcicki¹, Emily Malley¹, Victoria J. Vieira¹, Stephen A. Martin¹, Brandt D. Pence¹, Jeffrey A. Woods¹, Edward McAuley^{1,7}, and Arthur F. Kramer^{2,3,4}

Environmental Enrichment as a Vehicle to Brain and Cognitive Health



Challenges of Physical Activity & Exercise Programs

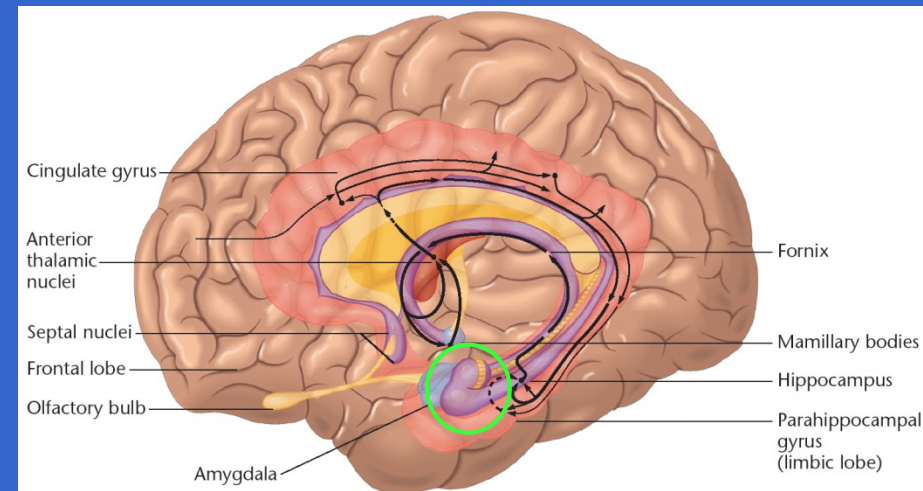
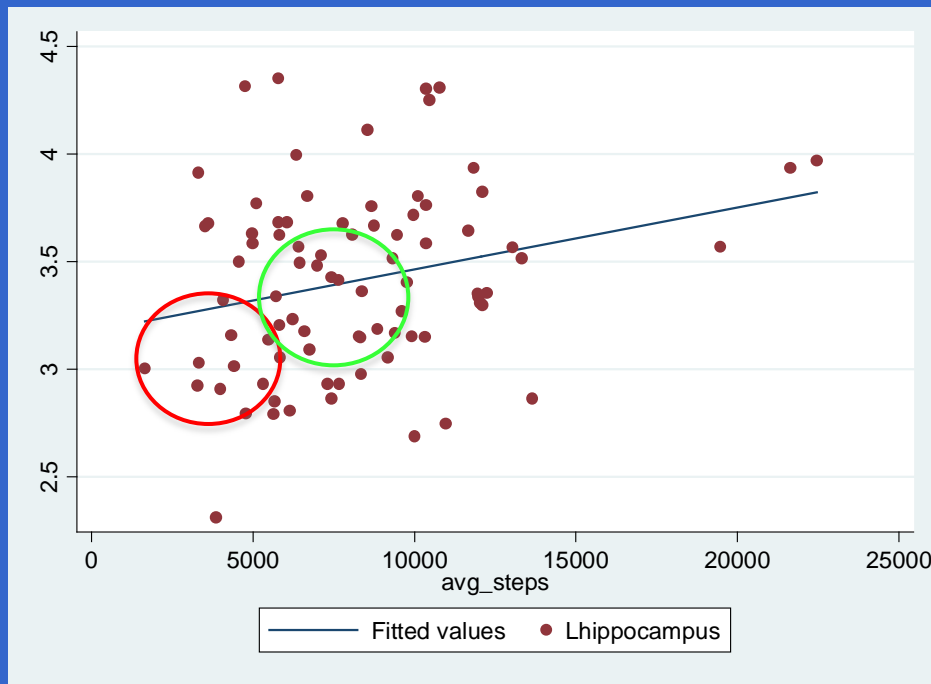
- Cross-word puzzles & physical exercise are hard to sustain and enjoy
- Spontaneous physical activity decreases with age in all organisms (Wilkin, et al., 2006)
- Kids play & adults work out (Studenski)
- Current physical activity guidelines not met by most older adults



Lifestyle Physical Activity and Brain Health

1000 more steps/ day is associated with a larger hippocampus, a brain region important to memory and dementia risk

Even small increases in daily walking activity may matter



Varma, Chuang, Harris, Tan, & Carlson, 2014, *Hippocampus*

How do we make exercise and good diet easier to access and enjoy?

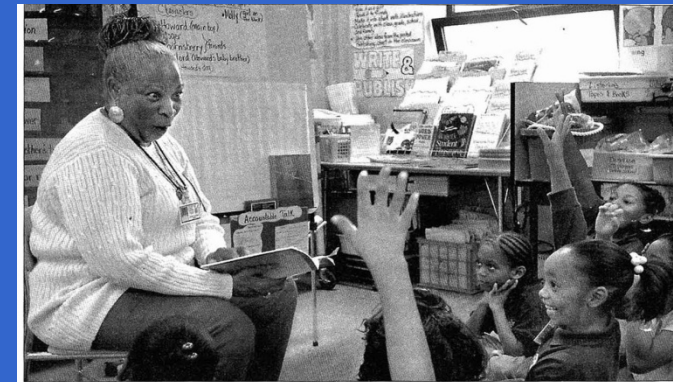


Humans are Built to be Social over the Life Course

- “Bowling Alone”-social capital allows for effective collective action through social relationships built on mutual trust, collaboration, and norms of reciprocity (Kawachi, 1999; Kawachi & Kennedy, 1997; Putnam, 2000)
- Generativity is essential to successful late-life development by transferring accumulated knowledge and wisdom to younger generations (Erikson, 1982)
- Baby Boomers seek to remain productively engaged in retirement (Gardyn, 2000; Scheibel, 1996; Powers, 1996)

Activity through Social Health Promotion: Experience Corps

- Volunteers 60 and older
- Serve in public elementary schools: K-3
- Multiple roles to exercise executive function, memory
 - Reading literacy
 - Library support
 - Math support
 - Behavioral support
- ≥ 15 hours per wk
- Travel to & from schools; walking within schools
- Sustained dose: full school year



"YOU ARE A FRIEND IN THE CLASSROOM."
AUDREY WEEMS, 70, READING A STORY TO STUDENTS IN A THIRD-GRADE CLASS AT WAVERLY. A MOTHER OF EIGHT, SHE WORKED AT THE SOCIAL SECURITY ADMINISTRATION FOR 35 YEARS, RETIRING IN 2002. WEEMS LEARNED ABOUT THE BALTIMORE EXPERIENCE CORPS PROGRAM THROUGH HER CHURCH.

*Freedman & Fried, 1997; Fried et al., 2004;
Fried et al., 2013; Glass et al., 2004*

Value of a Model of Generative Service: Merging 2 Developmental Needs

- What older adults do affects their health
 - remaining relevant, engaged, & active
 - access to health promotion varies, particularly among those at risk for health disparities, where drop-out is high
- Teaching children during critical developmental window: Pressing need to close the achievement gap between disadvantaged students and their peers
- An aging society can bring benefits to a developing generation:
 - Wisdom, time, and experience
 - Potential societal “win-win” on both ends of the life course

Next up: Tony Gentry

#AIRAging

Tony Gentry, PhD OTR/L



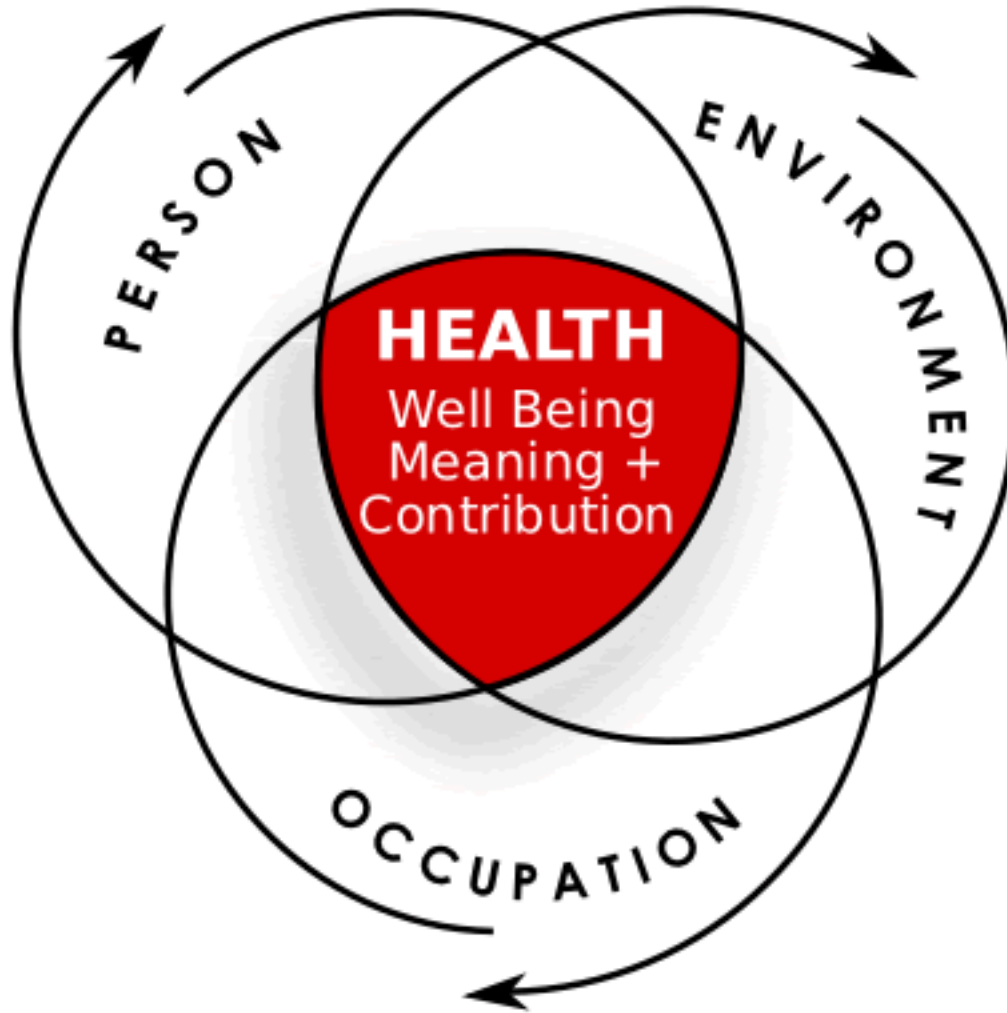
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Occupational Therapy





PEO Model

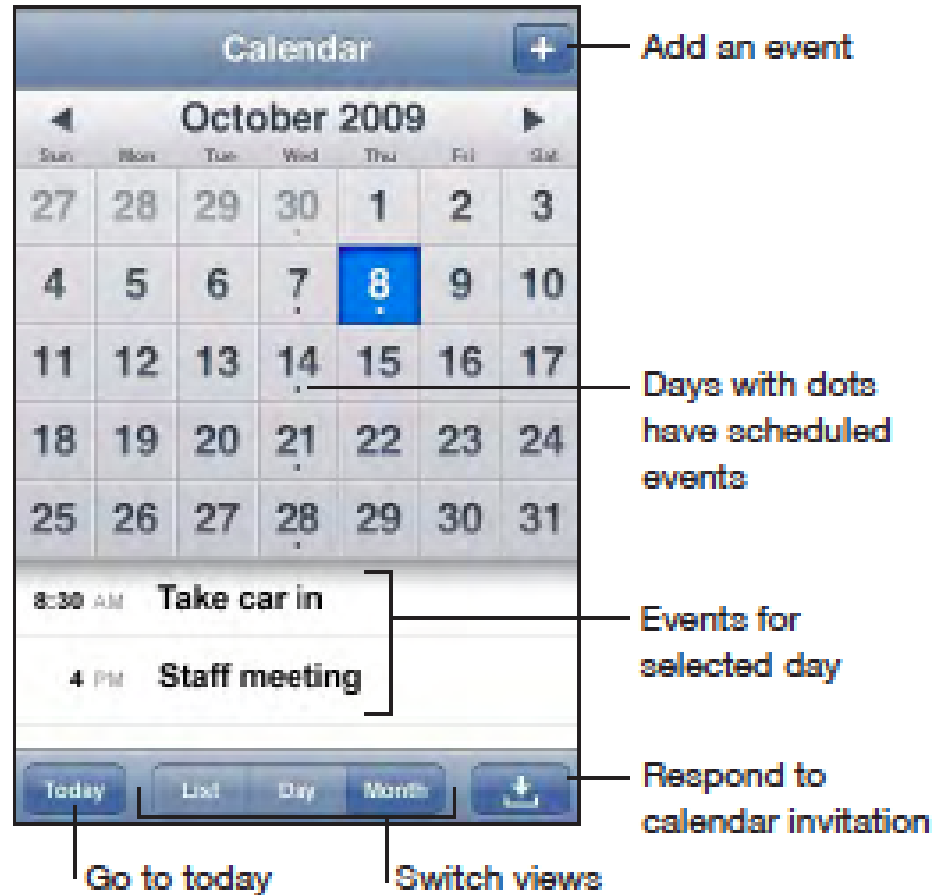


- File clerk with autism
- How will he stay on schedule?
- How will he alphabetize?
- How will he ask for help?



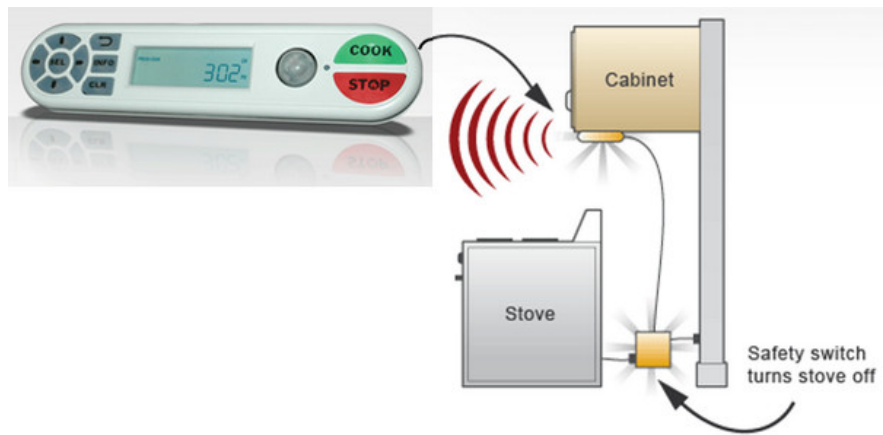
Typical reminders

- Wake up
- Shower/breakfast
- Medications
- Catch bus
- Clock in at work
- Break time (with timer)
- Lunch (with timer)
- Switch from one task to another
- Clock out and go home
- Medications
- Plug in device to charge overnight



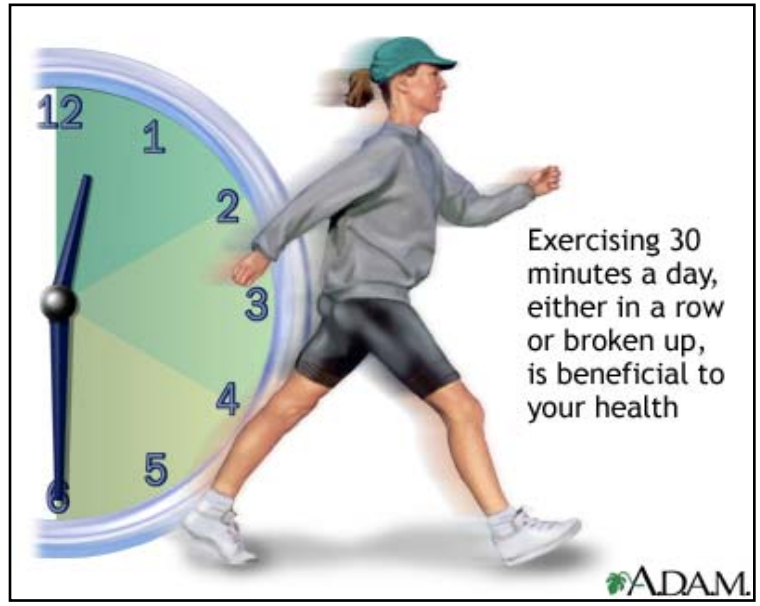
- Reminders
- Instructional Slide Shows or Videos
- Facetime with Job Coach
- Behavioral Rewards App

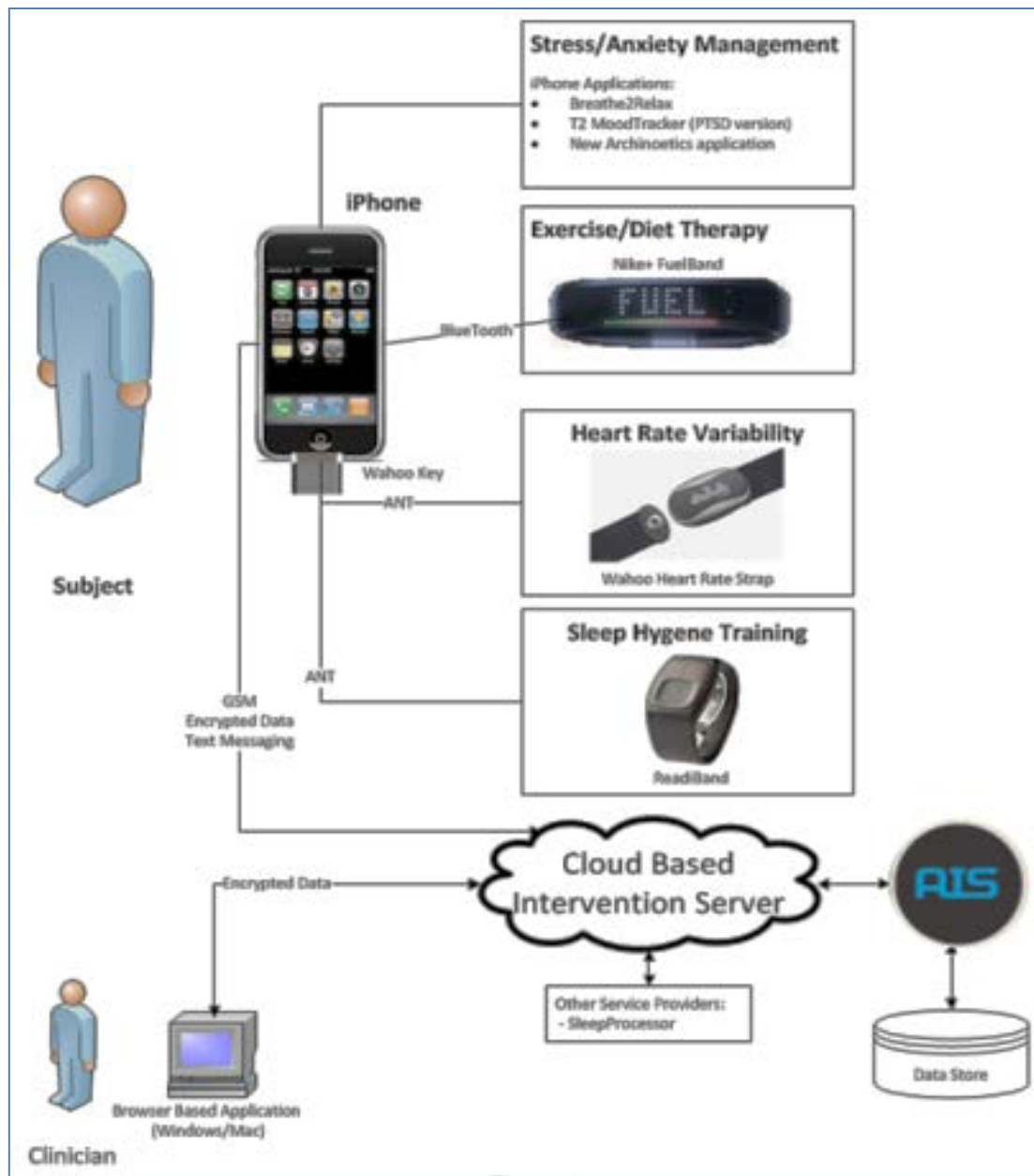












If the target is everyday functional performance....

- Robust Evidence for Assistive Technology
- Focus on interventions that help people achieve everyday goals
- Support sleep, nutrition, stress reduction, and exercise
- Safety and function at home, work, community



Next up: Robin West

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Public Policy and Translation to Everyday Life

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University of Florida

Dept. of Psychology

June 3, 2015

Public Policy

- ▶ Focus on prevention of decline
- ▶ Focus on importance of activity/engagement
- ▶ Focus on motivation and challenge
- ▶ Exercise PSAs (physical and mental)

Public Policy

- ▶ Insurance for physicians/psychologists
 - ▶ Prescription for training
 - ▶ Free online subscription
 - ▶ Free self-help book
 - ▶ Free enrollment (resources)
 - ▶ Reimbursement for training

Translation to Everyday Life

- ▶ Training at Home
- ▶ Public Resources
 - ▶ National Council on Aging
 - ▶ American Association of Retired Persons
 - ▶ Senior Centers/Area Agencies on Aging
 - ▶ County extension
 - ▶ Clinicians
 - ▶ Training experts

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