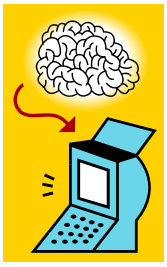
agog dinner & discussion | **Maintaining Healthy Cognition**

On May 18, 2010, Susan and Jim Rech welcomed 35 guests to their SW Portland home to explore how the brain changes as we age, ways to keep our brains active and healthy, and how we can help others experiencing changes in memory and cognition.

Three noted brain experts in the Portland area facilitated the discussions: **Dr. Jeffrey Kaye**, Director of the Layton Aging & Alzheimer's Disease Center and the Oregon Center for Aging and Technology at OHSU; **Dr. Scott Losk**, Principal Investigator at Oregon's Summit Research Network; and **Dr. Michael Mega**, Medical Director of the Providence Cognitive Assessment Clinic, Providence Brain Institute.



A healthy human brain is able to learn new information. Like a computer, we can think of our brain as having working (RAM) memory. When it is overloaded with information it can be written and stored on the hard drive – or memory. When the info is written on your hard drive, it gets distributed throughout your brain (stored in fragments within your brain -- auditory, olfactory, visual/spatial, emotional), and then reinforced through REM sleep.

Cognitive health peaks at age 22. After puberty, a female's cognitive abilities are superior to a male, except for visual/spatial/math. Prior to puberty, a female's cognitive abilities are superior at every level. But whether a man or woman one shouldn't worry too much about gender differences as there is tremendous individual variation such that the average abilities of men and women overlap considerably. There are highly capable women mathematicians, as well as men of letters.

Forgetfulness is normal – aka "senior moments" when you forget where you parked your car, you have trouble recalling someone's name, etc. Retrieval is not a failure to commit information to memory or not being able to learn new information. Throughout normal aging, we should always be able to learn new things and acquire new skills. With Alzheimer's, the brain loses the ability to learn new information and to consistently write that information to the brain's hard drive.

Causes of Alzheimer's Disease (AD)

Alzheimer's Disease is the most common form of dementia. Dementia is not a disease; it is considered a syndrome consisting of decline in cognitive function that interferes with day to day function in daily life. AD may be several diseases that look similar clinically, but have different root causes. AD affects certain parts of the brain before others. Over time, our brains have developed from a 3 layer cortex to a 6 layer cortex. It is in between layers 3 and 6 where AD seems to originate.

- Aging is the #1 cause of AD…and AD is the #1 cause of dementia. If we all lived to 105, almost all would have AD (There are a few rare centenarians such as have been seen at the

Oregon Brain Aging Study who did not have dementia when they died and did not have significant pathology in their brains when examined after death).

- 5% of the population who is aged 65 has AD
- 50% of the population who is aged 85 has AD
- AD is one of many causes of dementia (other causes e.g: physical trauma, nutritional deficiencies, infections, strokes)
- After more than 20 years of research and study, AD has now been linked to a build-up of amyloid beta protein in plaques in the brain.
- There is a 40% higher incidence of AD among retired football players. Repeated concussions can put you at risk for AD. (ex—Mohammed Ali…ok, he's not a football player, but you get the idea!)
- Early onset AD (before the age of 50) is often genetic, and usually results in death earlier. For less than 1% of the population, a genetic mutation on chromosome 21 can give people a 50/50 chance of developing AD. For every five year increment over 65, the risk goes up significantly.
- Other risk factors revolve around the presence of APOE-4 (Apolipoprotein E) 4.
- Small, frequent strokes are more damaging to the brain than large single strokes.
- Symptoms of AD may not become apparent until after as long as 10-15 years, but an MRI may detect the changes in the brain earlier.

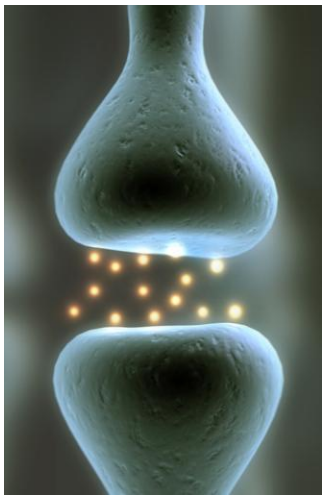
People with greater 'cognitive reserve' can better compensate for the brain plaques and tangles that come with aging. 'Cognitive reserve' refers to your brain's ability to find alternate pathways to access and manipulate information. Research scientists are now working on an antibody that pulls this protein from the brain and is expelled in urine.

Simple tests you can do to assess cognitive health (note: results vary day to day normally)

- Seven digit number – memory recall, then delay of time and recall. A healthy brain can hold 7 (+ or – 2) things in memory for two minutes.
- 8 words – delay of time – and then test memory recall (cabbage, table, dog, baseball, Chevrolet, belt, etc.) As we age, we may not be able to remember as many – but prompting questions such as "What type of vegetable was on the list?" can help trigger recall for someone with good cognitive health; whereas the trigger questions would not help recall as much for someone who has dementia or Alzheimer's.
- Problem solving
- Language: Name 14+ animals in 60 seconds. Those who can't have a 20x greater chance of developing Alzheimer's.
- Visual/spatial /math abilities
  Example: "Close your eyes and verbally give me general directions on how to get from Portland, Oregon to Disneyland."; draw a 3-dimensional image; add or multiply two numbers, etc.

An interesting fact: a healthy 85 year old can recall 6 out of 10 words in a memory recall activity.

Use it or lose it is a good mantra. Neuroplasticity and neurogenesis continue to change and grow. You can grow new connections within your brain at any age! It is just not yet clear as to how many can be gained. But there is nothing to lose in trying to rev up this system. **Ways to increase cognitive function and promote brain health:**



- Be active in your community and socially engaged
- Be active in a spiritual community
- Create novelty in your day-to-day life
- Do things to keep you cognitively active. Learn something new - a new instrument, a new language, a new skill; driving or walking a different route; doing crossword puzzles and games, etc. Do things that you like to do – "the brain likes to feel good"
- Get a full night's rest (7-8 hours /night) consistently
- Create agendas and keep lists for yourself (this helps write information to your "hard drive")
- Decrease stress
- Get 45 minutes of aerobic exercise, 4x per week, which helps reduce the amount of amyloid beta protein in the brain. Lateral physical movements help the cortex and memory. Core training is good for low back/spine/disks.
- Do the same things you would do to improve cardiovascular health: lower cholesterol and reduce the amount of fatty foods in your diet.
- Increase intake of flax seeds and curry (containing turmeric)
- 1-2 glasses of red wine or alcohol/daily for women; 2-3 glasses of red wine or alcohol/daily for men; 500 mg of caffeine a day may help prevent AD (a 16 oz Starbucks Grande has about 300mg of caffeine; a 12 oz Coke has 34 mg)

Current and future research

In Dr. Mega's opinion, what is needed now is translational research to enlist pharmaceutical companies into research/lab testing to achieve breakthroughs in developing effective drugs in blocking build-up of amyloid beta protein. Within 10 years, Dr. Mega predicts there will be drugs on the market that will reduce or block the escalation of amyloid beta protein.

A current drug on the market for treating AD, Aricept, is like treating a cold with cold medicine. It treats the symptoms, not the underlying disease. The drug industry is profit-driven and advances in AD medications will only occur when there is a financial benefit.

Translating what we know into effective treatments is a high priority. Dr. Kaye's research over the past 20 years has focused on identifying clues to the causes of AD – the events or risk factors that may lead not only to amyloid protein in the brain, but to small strokes and other common changes that accrue as our brains age. Dr. Kaye continues to lead the Oregon Brain Aging Study a major long-term study (now in its 20th year) of exceptionally healthy oldest old (those over age 85)

including a number of centenarians to discover "how their brains have remained protected". They do annual cognitive assessments, MRIs, blood tests, genetic tests and when the person dies their brain is donated to the study. They have found a number of important clues related to a number of factors such as genes (apolipoprotein E2 is associated with optimally healthy brain aging at advanced age), brain reserve (the more brain you have on MRI to begin with as an adult, the less likely you are to develop dementia), and physical activity (a person's walking speed, when tracked over time is often a good indicator of who will develop a cognitive impairment a decade later). Most surprisingly the study has found that some degree of medical challenge – a little bit of high blood pressure or heart disease – may actually not be so bad for you in that it seems to keep the bodies defense systems prepared for more severe insults.

In the course of conducting the Oregon Brain Aging Study Dr. Kaye has become very involved in developing and using technology to track behaviors and activity of older adults in their natural home environment. For example, unobtrusive sensors about the home can monitor how many times a person gets up at night to use the bathroom, how often they go to the refrigerator, how long they sleep each night and their physical activity level (including their walking speed) every day. This creates the possibility of being able to provide this difficult to remember, but key health information to your doctor before your brain runs into trouble. The technology exists today, it is just a matter of completing the research needed to identify the best ways to integrate this information, scale it out to the community at large and then use it in the current health care system.

Dr. Losk's studies are ongoing clinical trials investigating compounds that may be both symptomatic and/or disease modifying (potentially getting at the underlying cause of AD). He has been conducting clinical trials for 20 years and is moving toward new compounds that will potentially stabilize or improve cognitive functioning and prolong independent functioning in patients.

To learn more about brain health, visit:

Oregon Summit Research Network
Providence Brain Institute
Layton Aging & Alzheimer's Disease Center
MFS agog Learn More page

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Metropolitan Family Service

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