2012 MDRT Annual Meeting e-Handout Material

Title: Keep Your Memory and Focus Sharp at Any Age

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Pamela W. Smith, M.D., MPH

Keep Your Memory and Focus Sharp at Any Age

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Memory

• "A man’s real possession is his memory. In nothing else is he rich, in nothing else is he poor."
  Alexander Smith,
  nineteenth-century Scottish poet

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Age Related Memory Decline

• Studies have shown that there is a memory decline from age 25 to age 40 of 21%.
• This decline continues, so that by the age of 70–79, the memory decline is 43%.
Alzheimer’s Facts

- Several genes have been identified that cause Alzheimer’s disease (chromosomes #12, #19, #14, #1, #21, apolipoprotein C1, HLA 2A gene).
- Apolipoprotein E4 (APOE 4) is a gene that is carried by 30% of people, but only 10% of those who carry the gene get Alzheimer’s disease.
- The younger the onset of Alzheimer’s disease, the more likely it is genetic.
- Head trauma with loss of consciousness doubles the risk of getting Alzheimer’s.
- Head trauma with APOE 4 gene increases the risk tenfold.

Alzheimer’s Facts (Cont.)

- Mother’s linkage is greater than through the father (9:1).
- The Cherokee Nation of Native Americans has a natural immunity to Alzheimer’s disease.
- African American and Hispanics have a higher rate of Alzheimer’s disease than whites.

Age-Related Memory Decline

- Immediate and remote memory decline little.
- Short-term and long-term are the main area of memory decline.
- Short-term memory is the area most conducive to improvement by mind exercises.
- The retrieval mechanism slows down with age.
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Age-Related Memory Decline
- Is a result of neglect of the body including the brain.
  - Toxic substances
  - Stress
  - Lifestyle issues
  - Nutrition and lack of nutrients
  - Hormonal decline and imbalance
  - Medications

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Toxic Substances

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Toxic Substances
- Heavy metals
- Solvents
- Fuels
- Pesticides
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**Heavy Metals**

- Arsenic --- from manufacturing
- Lead --- pipes, paints
- Mercury --- have fillings removed
- Cadmium --- cigarettes contain cadmium
- Manganese --- used in gasoline as an anti-knock additive
- Zinc --- has a high affinity for binding to amyloid protein and can act as a toxin by aggregating the beta-amyloid protein and leading to plaque formation


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**Heavy Metals (Cont.)**

- Aluminum --- present in cookware, food additives, antiperspirants, automobile exhaust, tobacco smoke, foil, cans, ceramics, antacids, anti-diarrheal medications, infant immunizations.
- Study revealed that aluminum in vaccines create a chemical reaction that could cause amyloid plaques and nerve death.


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**Heavy Metals (Cont.)**

- Iron --- iron-binding protein is increased in Alzheimer's patients
- Tin --- levels are elevated in Alzheimer's disease
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Solvents and Fuels
- Toluene—found in aerosols, nail polish, pains, cleaning agents
- Pesticides
- Carbon monoxide—the hippocampus is especially vulnerable CO.

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Stress

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Stress
- Study shows stress can rewire the emotional circuits of the brain
- Stress can destroy nerve connections
- Cortisol at high levels impairs the function of the hippocampus and can result in atrophy and death of neurons.
Stress (Cont.)
- Stress increases production of IL-6 which is an inflammatory marker that is increased in the brain of people with Alzheimer’s disease.
- It emphasizes how stress can affect the whole body.

Lifestyle

Unhealthy Habits
- Nicotine—cigarettes decrease blood flow to the brain. Nicotine increases brain cells to grow nicotinic receptors that respond to acetylcholine. But as acetylcholine production continues at a fast pace, the balance between the neurotransmitters in the brain becomes upset and the mental sharpness starts to decline.
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**Unhealthy Habits (Cont.)**

- Alcohol
  - Negatively affects emotion, processing sensory information, and regulating stress
  - Disrupts the balance of serotonin, acetylcholine, endorphins
  - Alters the activity in the hippocampus
  - Causes depression

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**Lack of Exercise**

- Lack of exercise can cause loss of cognitive function.
  - Physical exercise
  - Mental exercise
  - The benefits of physical exercise on the brain
  - Increases blood flow and oxygenation
  - Elevates release of mood-regulating neurotransmitters
  - Strengthens neural connections
  - Stimulates new neuron growth

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**Exercise**

- A 2003 study published in the NEJM revealed that people who went ballroom dancing twice a week were less likely to develop dementia.
- Another study revealed for every extra mile walked per week, there was a 13% less chance of cognitive decline.
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Unhealthy Habits (Cont.)

- Sleep deprivation decreases memory.
- Aspartame use—side effects
- Caffeine in moderation

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Nutrition

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Nutrition

- Fats
  - Plaque buildup narrows vessels decreasing blood flow to the brain
  - Saturated fatty acids interfere with glucose in the brain, its main fueling source
- Sugar—The average American consumes 140–160 pounds a year of sugar.
  - Depletes the body of B vitamins and calcium
  - Promotes inflammation by increasing free radical production
Estrogen helps maintain memory for both men and women:
- Enhances verbal memory
- Helps to maintain ability to learn new material
- Increases production of nerve growth factor
- Increases production of acetylcholine
- Stimulates increase in dopamine receptors in the brain
- Impedes the deposit of beta-amyloid
- Increases blood flow and helps maintain the integrity of the hippocampus

Testosterone helps maintain cognition for both men and women. Thyroid hormone helps maintain memory.

High DHEA levels due to stress decrease memory. Low DHEA levels due to stress and aging lead to cognitive decline. People with Alzheimer’s disease have levels of DHEA that are 48% lower than their normal counterparts.
High and low levels of cortisol affect memory. The solution is not to eliminate stress, but to change your perspective on it. Pregnenolone is the hormone of memory in the body.

- It makes DHEA, estrogen, progesterone, and testosterone
- Decreases with age
- At age 75, most people have a 65% decline compared to age 36.

Pregnenolone

- Regulates the balance between excitation and inhibition in the nervous system
- Increases resistance to stress
- Improves energy both physically and mentally
- Enhances nerve transmission and memory
- Directly influences acetylcholine release
- Reduces pain and inflammation
- Blocks the production of acid-forming compounds

Pregnenolone (Cont.)

- Promotes new nerve growth factor
Pregnenolone (Cont.)

- Pregnenolone is a hormone and like the rest of the hormones mentioned in this seminar must be measured before they are given.

Progesterone is made in the brain, spinal cord, and peripheral nerves from pregnenolone.

- Progesterone may promote the formation of myelin sheaths.
- Scientists are now looking at progesterone as an alternative for the prevention of memory decline.


Melatonin is a hormone that is an antioxidant and neurotransmitter.

- Melatonin aids with sleep.
- Melatonin is an immune builder.
- Melatonin levels are lower in people with Alzheimer’s disease.

**Insulin**
- Insulin is the hormone that regulates your blood sugar.
- Pre-diabetes
- Diabetes
  - Optimal blood levels
    - FBS 70–90
    - Fasting insulin 6
  - HgbA1C 4.0–5.7

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**Diabetes and Memory**
- Diabetes is associated with an increased risk of developing Alzheimer’s disease of 50% to 100%.

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**Diabetes and Memory (Cont.)**
- Diabetes is associated with an increased risk of the development of any type of dementia of 100–150%.
  - Ibid, Biessels.
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Medications

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Medications That May Affect Memory
- Analgesics (pain medications)
- Anti-arrhythmic drugs
- Antibiotics
- Anticonvulsants
- Antidepressants
- Antihistamines and decongestants
- Antihypertensive drugs

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Medications That May Affect Memory
- Levodopa
- Steroids
- Muscle relaxants
- Sedatives
- Statin medications
Promoting and Protecting Brain Health

- Avoid toxins
- Mitigate stress
- Exercise
- Hormonal balance
- Eat the right food
- Nutrients
- NSAIDs
- Medications

Food

- Eat foods that are antioxidant rich such as:
  - apples, berries (blueberries, raspberries, blackberries, strawberries), cherries, cooked kale, cranberries, garlic, grapes, prunes, raisins, and raw spinach.
- Eat organic
- Eating the twelve most contaminated fruits and vegetables would expose one to nearly twenty pesticides per day.
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Environmental Working Group: Contaminated Fruits & Vegetables
- Apples
- Celery
- Cherries
- Imported grapes
- Nectarines
- Peaches
- Pears
- Potatoes
- Red raspberries
- Spinach
- Strawberries
- Sweet bell peppers

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Least Contaminated Fruits and Vegetables
- Asparagus
- Avocado
- Bananas
- Broccoli
- Cauliflower
- Kiwi
- Mango
- Onion
- Papaya
- Peas
- Pineapple
- Sweet corn

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Fats
- Eat the good fats
- Nuts and seeds—pumpkin, sunflower, hemp, flax and sesame, walnuts, almonds, pine nuts, pistachio seeds
- Fish, lamb are both good sources of omega-3 fatty acids.
- Do not eat farm raised fish. They are low in omega-3 fatty acids and studies have shown them to contain high levels of toxins.
- Supplementation—with pharmaceutical grade only.
- EPA/DHA. None pharmaceutical grade can be contaminated with mercury.
Best eating habits
- Eat 5-6 small meals a day
- Eat little shellfish
- Eat red meat only 3 times a week
- Eat nuts and nut butters
- Keep soy intake to a moderate level
- Eat whole grains such as quinoa, amaranth, spelt, and teff
- Eat beans
- Cut down on dairy. Replace it with rice milk, almond milk, cashew milk, or oat milk.

Best eating habits (Cont.)
- Eat little sugar use no artificial sweeteners
- Use few carbonated beverages
- Eat few processed bread or wheat products
- Drink enough water
- Eat only certified organic food
- Avoid deep-fried or processed foods
- Use brain-healthy oils for cooking
- Avoid food additives, preservatives, coloring agents, flavorings, or MSG

Brain Nutrients
- DHA
- Phosphatidylserine (PS)
- GPC
- Ashwagandha
- Blueberry extract
- Grape seed extract
- Vinpocetine
- Ginger
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Brain Nutrients (Cont.)

- Gingko biloba
- Coenzyme Q-10
- Magnesium
- Boron
- Acetyl-L-Carnitine
- Alpha lipoic acid
- Carnosine

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Brain Nutrients (Cont.)

- Hyperzine A
- DMAE
- Curcumin
- B vitamins
- Vitamin E
- Vitamin C
- SAMe
- Amino Acids—methionine and tryptophan

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DHA

- Study revealed that senior citizens eating fish once a week decreased risk of memory loss.
- Children that are deficient in fatty acids frequently have learning disorders.
Low levels of DHA increase risk of Alzheimer's disease.
- Study of 1,188 senior citizens for 10 years revealed that Alzheimer’s disease was 67% more likely to develop in individuals with DHA levels in the lower half of the distribution.

DHA supplementation decreases free radical-induced levels of lipid peroxide in the hippocampus.

Is a phospholipid
- Helps control entry of nutrients into cells
- Increases neurotransmitters in the brain—acetylcholine, epinephrine, norepinephrine, serotonin, and dopamine
- Is present in fish, rice, soy, and green leafy vegetables
- Cannot get enough by diet to maintain memory after early middle age
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**PS**
- Studies show that PS helps maintain memory in healthy people.
- Studies have shown that it improves cognition in people with memory loss.
- Improves attention and concentration
- Improves ability to handle stress
- Dosage: 300 mg

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**References**

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**References (Cont.)**
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**PS and DHA**

- Scientist believe that PS works best when levels of DHA are high.

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**GPC**

- Glycerol-phosphoryl-choline is a main component of brain cells.
- It helps maintain adequate acetylcholine levels.
- Dosage: 800-1000 mg
- Studies have shown that GPC increases cognition in healthy people.
- Study revealed GPC improved cognition in people with Alzheimer’s disease.

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**Ashwagandha**

- Inhibits acetylcholinesterase (enzyme that breaks down acetylcholinesterase)
- Improves alertness
- Decreases stress
- Helps damaged neurons of the brain regenerate in animals
Blueberry Extract
- Studies at Tufts University showed that blueberry-fed rats outperformed other groups.
- Found in rats to increase dopamine levels.
- Improved learning and memory skills in mazes.

Grape Seed Extract
- Blocks formation of senile plaques.
- Has 20 times the free radical fighting strength of vitamin E and 50 times more than vitamin C.
- 2006 study on rats found that grape seed extract stopped the accumulation of age-related oxidative DNA damage in the spine and brain.
  

Vinpocetine
- Is from the periwinkle plant.
- Increases circulation.
- Enhances glucose utilization by the brain.
- Increases rate at which brain cells produce ATP.
- Increases serotonin.
- May affect clotting time if on coumadin.
- Dosage: 10-40 mg.
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Ginger
- Inhibits activation of an inflammatory response in the brain
- May be helpful in delaying the onset or progression of memory loss

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Ginkgo Biloba
- Is an extract from the leaves of the ginkgo tree
- Improves blood flow
- Blocks the shrinkage of the hippocampus
- Is an antioxidant
- Decreases inflammation
- Increases uptake of glucose
- Increases serotonin receptors
- Increases acetyl choline synthesis
- Dosage: 60-120 mg
References

Ginkgo Biloba
- Is a blood thinner and must be used with caution if on coumadin or other medications that thin the blood.

Coenzyme Q-10
- Fat soluble nutrient
- The amount that the body makes declines with age.
- Is an antioxidant
- Enhances the regeneration of vitamin E
- Has been shown to be effective in the treatment of Alzheimer's disease.
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Boron

- Increases electrical activity of the brain
- Low boron intake resulted in poor performances on tasks emphasizing manual dexterity, eye-hand coordination, attention, perception, encoding, and short-term memory and long-term memory in clinical studies.

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Acetyl-L-Carnitine

- Is an amino acid
- Acts as an antioxidant
- Made from lysine and methionine
- Need niacin, vitamin B6, iron, and vitamin C to make carnitine
- May slow the progression of Alzheimer’s disease
- Can be converted to acetyl choline in the body
- Improves mental focus and energy
- Enhances short and long-term memory
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**Acetyl-L-Carnitine (Cont.)**
- PS, B vitamins, alpha lipoic acid, phosphatidyl choline, and EPA/DHA help carnitine work more effectively.
- Dosage: 2,000 mg for memory
- Studies show improvement in memory, attention, verbal fluency, and daily behavior in people with mild mental impairment.

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**Acetyl-L-Carnitine References**

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**Alpha Lipoic Acid**
- Is an antioxidant
- Is both fat and water soluble
- The body makes less of its own as it ages
- Acts as a metal chelator for iron, copper, and cadmium
- Stimulates sprouting of new nerve fibers on nerve cells
- Strengthens memory and prevents brain aging
- Dosage: 100 mg for memory
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Carnosine

- Is an antioxidant
- Blocks the action of glycation
- Effective in the treatment of Alzheimer’s disease
- Dosage: 1,000-2,000 mg

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Huperzine

- Is a compound isolated from Hyperzia serrata, a Chinese herb
- Study revealed that huperzine showed a significant improvement in memory, thinking, and behavioral function when given to Alzheimer’s patients.
DMAE
- Found in sardines
- Increases acetylcholine levels
- Side effects: drowsiness, high blood pressure, confusion
- Dosage: 40-200 mg
- Is a brain stimulant so do not take if seizure disorder or bipolar depression

Curcumin
- Found in mustard and curry
- Decreases the accumulation of beta-amyloid proteins that can interfere with neural functioning

B Vitamins
- Help maintain memory—decrease homocysteine
Thiamine deficiency can result in Alzheimer’s dementia.
Thiamine protects the mitochondria against the oxidative stress responsible for the death of neurons and subsequent loss of cognition.
Treatment of Alzheimer’s patients with thiamine improves intellectual function.


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Is an antioxidant
Is also a blood thinner—may interact with medications that are blood thinners
Alzheimer’s patients have lower levels of vitamin E
Protects the brain from glutamate toxicity
Studies have shown that it slows the progression of symptoms of people with Alzheimer’s disease.

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Vitamin C
- Helps maintain healthy nerve cells in the brain

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SAMe
- Used to treat depression
- Promotes cell growth and repair
- Helps maintain levels of glutathione
- Alzheimer’s patients have low levels of SAMe in their brains
- Should not take if on a MAO inhibitor
- Dosage: 400-1,600 mg

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Amino Acids
- Methionine and tryptophan levels are low in patients with Alzheimer’s disease.

NSAIDs
- One aspirin a day or other NSAIDs has been shown to increase memory. More than one has been shown to decrease memory.

Medications
- Some only work for 6 months
- Much research is still needed in this area.
20% of disease is inherited, 80% is the environment that you put your genes in. In other words, even if you inherit a gene for Alzheimer’s disease, whether you get the disease or not is 80% up to you and the environment you put your body into, i.e., your genes can only be as healthful as the environment in which you allow them to exist.

“Education is what you have left over after you have forgotten everything you have learned.”
- Old adage