

Is there ANYTHING you can do to prevent Alzheimer's disease?

Alzheimer's disease (AD) is a concern for all of us. One new person is diagnosed with Alzheimer's every five minutes in Canada! 747,000 Canadians have AD, representing 15% of those over 65. With the tsunami effect of the baby boomers, we know those numbers are going to increase. The risk of developing this doubles every five years over age 65. In the USA they have a new diagnosis every 67 seconds. It is the 6th leading cause of death and they believe that to be an underestimate.

The scary part is we are not making any substantial progress with this disease. Other diseases are improving - between 2000 and 2013 deaths from heart disease dropped 14%, stroke deaths dropped 23%, prostate cancer dropped 13%; however, Alzheimer's disease rose 71%. We should be worried!

The costs of the disease are staggering! \$33 billion dollars per year in Canada. In 2011, caregivers gave 444 million hours of unpaid work looking after their family member with AD, adding up to about \$11 billion of lost income.

Alzheimer's Disease accounts for approximately 50% of the dementias. Those with the ApoE 4 gene have a greater risk and get it at a younger age. There are plaques and tangles that interfere with thought, cell death and deposition of a protein called beta amyloid. This results in loss of cognitive and functional abilities, causing short term memory loss, trouble communicating and making decisions. Emotional issues are common with apathy and depression. They experience personality changes such as repetition of words or phrases, hoarding, and physical outbursts. It is so sad to witness someone you love go through this.

What we know now is that brains are "neuroplastic"- meaning that the "circuits" change in response to what we are doing with our lives. Learning new skills can create new connections. Mental and physical exercise can lower the risk.

Six pillars of a brain healthy life:

1. **Regular Exercise.** This means doing 30 minutes of AEROBIC exercise 5 days/week. Some studies indicate that weight training is better than walking. Balance and coordination exercises help prevent falls and therefore prevent head trauma, another risk for AD.
2. **Healthy Diet.** The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet was created by nutritional epidemiologist Martha Clare Morris, PhD, and her colleagues at Rush Memory and Aging Project. This diet consists of 15 dietary components: 10 "brain-healthy" food groups and five "unhealthy" food groups. People who followed this diet had a 35% reduction in AD. (see MIND component servings at the end of the article).

Brain Healthy Foods include green leafy vegetables, other vegetables, nuts, berries, beans, whole grains, fish, poultry, olive oil and wine. Foods groups that should be limited are red meat, butter and stick margarine, cheese, pastries and sweets, and fried or fast food.

3. **Mental Stimulation.** Learn a foreign language, practice memorizing things, practice strategic games, and vary your habits. By this I mean, do things with your left rather than your right hand, and take a different route to the grocery store. **Brain HQ**, developed by Dr. George Rebok at Johns Hopkins University, is an interesting series of games that can help in 6 areas of mental functioning: attention, brain speed, memory, people skills, intelligence and navigation. For \$8/month you can receive online monthly exercises - check them out at www.brainhq.com.
4. **Get Quality Sleep.** Sleep for 8 hours. (More easily said than done!)
5. **Stress Management.** Practice restorative breathing, do daily relaxation exercises. Enjoy music or hobbies. Set a little time EACH DAY to do something that you love. I can hardly wait to be out in my garden!
6. **Have an active social life.** This is a very important stage of life to enjoy your family and friends- social engagement keeps us on our toes!
 - (Here it comes....) **Give up alcohol and smoking!** For smokers over 65 the odds of developing AD are increased by 79%! If you both drink alcohol and smoke there is a 6 to 7 year earlier onset of symptoms.

A long term study done between 1964 to 2008 by Kaiser Permanente showed that women who were heavy smokers in midlife had a 157% increased risk in developing AD and a 172% increased risk of vascular dementia. They also found that having high cholesterol and a large abdominal measurement increased your risk of dementia. Women with the highest measurement of abdominal weight had 2.72 times increased risk of dementia. This was an independent risk factor.

There are a few **interesting studies** I'd like to summarize for you. There is so much research in this field it is astounding!

1. Dr. Peter Cardiff in UK studied 2,235 men age 45-59 at enrolment for 35 years. He looked at 5 behaviors:
 - regular exercise
 - non-smoking
 - healthy body weight
 - healthy diet
 - low alcohol

If they had 4 out of the 5 behaviours, they had a 60% decrease in dementia and cognitive decline.

Exercise was the behavior that had the most influence. For this study the exercise was walking 2 miles/day or biking 10 K/day or other vigorous exercise. Along with the 60% reduction in dementia, they also enjoyed a 70% reduction in heart disease, diabetes and stroke compared to those who only had one of the behaviors. Pretty amazing evidence! Sadly, less than 1% of the people in Wales have all 5 behaviors.

If they had adopted even one healthy behavior 35 years ago and only half complied they would have had a 13% reduction in dementia, 12% reduction in diabetes, 6% reduction in vascular disease and 5% reduction in death.

2. Dr. Kirk Erickson at the University of Pittsburgh showed that higher fitness correlates with larger volume of the hippocampus and basal ganglia areas of the brain. These areas are important for regulating emotions and long term memory. They also play a role in spatial navigation. He found that those who exercised had greater integrity of the white matter in the brain that allows communication to and from grey matter areas and the other parts of the body. They also showed more efficient patterns of brain activity, better memory function and superior executive function (making good decisions). He studied brain function by doing functional MRIs.
3. Reversing Cognitive Decline. Dr. Dale Bredeisen published a report in Aging, Sept 2014. The report is long and complicated and I have listed it in the references. Essentially, he tells of three examples where people had to quit work because they were functioning so poorly. They basically practiced the 6 pillars; however, there were a lot of rules: fasting for 12 hours from evening to morning, with no eating 3 hours before bed. The exercise was more vigorous and they were taking more supplements such as Vitamin B12, DHA/EPA, hormones, pre and probiotics to name a few.

They did very well, although they found that such a rigorous program was hard to maintain over the long term.

4. Assessing the effect of hormone therapy on the brain. Dr. Natali Resgon did an amazing study on 45 postmenopausal women to assess the metabolism of different areas of the brain using functional PET scans. She combined those findings with measuring their cognitive function. These women all had at least one risk for AD; having a first degree relative with AD, a genetic marker for developing AD (ApoE-4), or a history of depression. The results showed that compared to those who were randomly selected to stop hormone therapy, those who continued on estradiol alone had the best outcome. The areas that typically decline in the early stages of AD were preserved and their mental function was maintained. However, if they were on medroxyprogesterone (Provera) it negated the beneficial effect. CEE (conjugated equine estrogen) was not as effective as estradiol.

Hormones and Alzheimer's

I think this is why there are so many controversial reports on the effectiveness of hormone therapy. For example, Dr. Elizabeth Barrett-Connor wrote a review in Semin Reprod Med in 2009. She looked at many studies involving not only external estrogen exposure, but also measuring estrogen produced in our body and failed to show consistent results. Unfortunately, most of the studies that have been done for a long time involved Premarin and Provera and the women in the studies were already in their sixties which is too late to preserve function. They also were of too short duration.

Recent and more sophisticated studies actually looking at brain function have shown a difference, showing that not all hormone therapy has the same effect. Estradiol is better than

CEE and progestins negate the benefit. You can't turn back the clock and say "I should have started the meds years ago". Until more information is available, for my money, if you are at risk, you might want to consider taking estradiol. Although, the extensive, long term studies in this are not available at this time.

I could site many more studies but the evidence is very clear that exercise is the most important behavior, and the other five are important as well. With estrogen, it must be started early in order to have the opportunity to preserve function. Once the changes have occurred, it will not reverse them. Medroxyprogesterone (Provera) will negate some of the benefit so should be avoided. Progesterone is protective and increases the expression of the anti-apoptotic protein Bcl-2.

REFERENCES

1. Alzheimer's Society of Canada www.alzheimer.ca
2. The Alzheimer's Information Site www.alzinfo.org
3. Alzheimer's Disease Education and Referral Center www.nia.nih.gov/alzheimers
4. Alzheimer's Disease, Unraveling the Mystery National Institute on Aging www.nia.nih.gov
5. Impact of Estrogen Therapy on Alzheimer's Disease Roberta Brenton CNS Drugs 2004,18(7)
6. Physical Activity, Brain and Cognition Dr Kirk Erickson ; Current Opinion in Behavioral Sciences 2015 4.27-32 www.sciencedirect.com
7. Brain HQ from Johns Hopkins University www.brainhq.com
8. "The Brain's way of Healing" a book by Dr. Doidge of U of T and Columbia University's Center for Psychoanalytic Training and Research
9. Reversal of Cognitive Decline, a novel approach Dr Dale Bredesen – University of California
10. Prospective Randomized Trial to Assess Effects of Continuing HT on Cerebral Function in Post Menopausal Women at Risk for Dementia Natalie Rasgon et al www.plosone.org March 2014 volume 9 issue 3
11. Endogenous and Exogenous Estrogen..., Dr. Elizabeth Barrett-Connor in Semin Reprod Med 2009 May; 27(3): 275-282.
12. MIND diet associated with reduced incidence of Alzheimer's disease, Martha Clare Morris, et al.,2015 The Alzheimer's Association, Published by Elsevier Inc.

MIND Diet component servings:

MIND = Mediterranean-DASH Intervention for Neurodegenerative Delay, M.C. Morris et al

Consume:

Whole Grains $\geq 3/d$ (greater than or equal to 3 servings per day)

Green Leafy $\geq 6/wk$ (greater than or equal to 6 servings per week)

Other Vegetables $\geq 1/d$ (greater than or equal to 1 servings per day)

Berries $\geq 2/wk$ (greater than or equal to 2 servings per week)

Fish $\geq 1/wk$ (greater than or equal to 1 servings per week)

Poultry $\geq 2/wk$ (greater than or equal to 2 servings per week)

Beans $> 3/wk$ (greater than 3 servings per week)

Nuts $\geq 5/wk$ (greater than or equal to 5 servings per week)

Alcohol/wine **1/d** (one serving per day)

Olive Oil primary oil

Avoid or Limit:

Red Meats and products $< 4/wk$ (less than 4 servings per week)

Fast/fried food $< 1/wk$ (less than 1 serving per week)

Butter, margarine $< 1 T/d$ (less than 1 tablespoon per day)

Cheese $< 1/wk$ (less than 1 serving per week)

Pastries, sweets $< 5/wk$ (less than 5 servings per week)

*** for serving sizes please see Canada Food Guide