



Women's Brain
Health Initiative

MIND OVER MATTER

INSIGHT INTO THE LATEST RESEARCH FINDINGS
TO COMBAT BRAIN AGING DISEASES AND THE TOOLS
YOU NEED TO *STAY BRAIN HEALTHY LONGER.*

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STEPHANIE HAHN | WRITER

Stephanie is a writer and yoga instructor living in Waterloo Region, Ontario. It was through the 'gift' of back pain that Stephanie learned to slow down, listen to her body and rediscover the joys of moving. "Writing for this magazine allowed me to merge my love of writing with my love of spreading the word that stress relief is critical for health."



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Vitina is a freelance graphic designer and a yogi at heart, who strives to live a well balanced, healthy lifestyle. "As a designer, you learn a wealth of knowledge from your clients over time. My work with WBHI has positively influenced my daily life and has become a creative outlet for me. My cooking skills have even been taken to a new level, thanks to Memory Morsels!"



LAURA MANDELL | WRITER

Laura is an Account Director with Toronto-based Brown & Cohen Communications & Public Affairs Inc. She is also an accredited mediation teacher. "There are many causes that stir us to action. WBHI resonates for me because our ability to positively impact our own lives - and the lives of others - will ultimately be governed by our cognitive health."



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Amanda is a Digital Strategist with a passion for developing digital marketing approaches for the social innovation, public and non-profit sectors. "Whether you label me a foodie or just recipe driven, I scour the web for new, interesting healthy recipes and spend all my free time in the kitchen; a perfect alignment with Memory Morsels core objectives."

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WITH THANKS...

Thanks to the generosity, encouragement, inspiration and support of Sylvia Soyka and Marc-Adam Soyka-Steinman, the Women's Brain Health Initiative is able to fulfill its vision of creating the Mind Over Matter magazine.



WOMAN OF
BEAUTY



WOMAN OF
VITALITY



WOMAN OF
COURAGE



WOMAN OF
COMPASSION

My mother was a beautiful person inside and out. She was a loving and caring daughter, sister, friend, wife, mother and grandmother - often in ways that stretched the imagination. Niusia was very social and connected: the sort of person who touched people's lives. A genuine heroine who saved 99 lives in wartime, my mother lived her life with intelligence, style, charm, vitality and, above all, compassion. Too early we started to lose her, bit by little heart-breaking bit, long before her body gave out. Her life and our experience have inspired us to support research and education in women's aging brain health. It is our hope that this magazine will give women helpful resources and reliable information to help them strengthen their bodies and minds against the insidious destruction of Alzheimer's and other forms of dementia.

Mom, your brightest images shine still in my heart.

S. Soyka

Sylvia Soyka

A WOMAN LOST TOO
SOON TO DEMENTIA



FRANCISZKA "NIUSIA"
MEHL SOYKA
1918- 2010

EDITOR'S LETTER

Join our efforts to grow awareness of the Women's Brain Health Initiative.

I am thrilled to bring you the first issue of the Women's Brain Health Initiative MIND OVER MATTER magazine. As the leader in the fight against women's brain aging disorders, we wanted to give you access to the most current thinking on ways to maintain a healthy body and mind, for yourself and your loved ones.

Since the charity's launch last May on Parliament Hill, the Women's Brain Health Initiative (WBHI) has made tremendous strides in raising awareness about the inequity in brain aging research funding for women; especially since women suffer from brain aging diseases like Alzheimer's, stroke and depression twice as much as men. As a direct result of our efforts, the Canadian Consortium on Neurodegeneration In Aging, a collaboration of Canada's best and brightest neuroscientists, has established a Women & Dementia core to help ensure future studies and therapy programs take sex and gender into account.

We kicked off a cross-Canada tour at Queen's Park in Toronto last fall with the support of all political parties and in partnership with Deloitte Canada. In six cities across the country, we spoke to leaders in healthcare about the need for research focused on women's brains. With the help of renowned neuroscientists, we outlined what we do know that can help women stay brain healthy longer. We recorded all these sessions to create a resource video library on our website (womensbrainhealth.org/mindovermatter) to help people learn how to protect their brain health.

Through speaking to many of you across Canada, we understand that you want to know more about the best ways to protect your brain health and if and how your actions impact your risk for diseases like Alzheimer's, dementia, depression and stroke.

I am excited to bring you a magazine that advocates healthy living, brain health awareness, and improved brain research. It empowers

modern women to rethink their habits and make better long-term choices for themselves and their families.

Inside these pages you'll find interviews with leading scientists, interesting facts, statistics and checklists. The studies referred to are relevant to the lives of women across North America. You'll also read personal profiles of those dealing with the impact of aging brain health related diseases.

Ultimately, it is my hope to connect you to the subject of brain health as well as to the Women's Brain Health Initiative.



In addition to all that we have learned, we know that most people are still surprised how little we know about women's aging brains. Most of us don't realize that almost 70% of new Alzheimer's sufferers will be women and how much funding is required in order to study the female brain specifically.

With that in mind, I ask you to join our efforts to grow awareness of the Women's Brain Health Initiative (WBHI) and its mission to (1) fund innovative research to combat brain aging diseases in women and (2) educate the general public on ways to stay brain healthy longer. Please share this magazine, send us your feedback and continue to support WBHI so that we can grow the important work we began just one year ago.

You should give, so that together we can reinforce how very much our grey matter matters.

Lynn Posluns | Founder and President,
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Editor and Publisher,
MIND OVER MATTER magazine



The Women's Brain Health Initiative is a charitable non-profit with a mandate to provide education and fund research to combat brain aging diseases that affect women. We rely on philanthropic gifts to support this endeavour, and we are deeply grateful to the following individuals and organizations for their contributions.

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GOOD, BETTER, BEST

WOMEN'S HEALTHY AGING Q&A WITH DR. VIVIEN BROWN

Our brains are just one part of our bodies, so to keep our brains healthy means considering a wider context. In this article, Dr. Vivien Brown, a family physician based in Toronto, shares some insights into how a woman can take care of her whole body, ensuring that she remains vibrant and healthy as she ages.

Q HOW WOULD YOU DESCRIBE A HEALTHY OLDER WOMAN?

A. A healthy older woman is active and independent. By active, I mean being able to do the things you want like meeting your friends, going out, and working out. You don't have any limitations based on physical issues. To me, being independent is a more cognitive aspect of health. It means you're able to do things such as your own banking, your own housekeeping and travel without needing someone to accompany you. You can live on your own; you're not in any kind of an institution. Active and independent are the two words that best describe a healthy older woman, both contributing to a good quality of life as she ages.

Q WHAT ARE GOOD INDICATORS OF HEALTH IN OLDER WOMEN?

A. There are several markers that are con-

sidered predictors for how well you are going to age in the next 10 years. Those include: self assessment of quality of life, Body Mass Index, ability to walk/run, ability to squat down to the floor and having a strong grip.

It is interesting that your own assessment of how you are doing is usually very accurate; studies show this. When you go to see your doctor and say "I'm a mess," you're probably right. But if you're feeling good, that's a positive sign that you probably are in good health.

The ability to grip and the ability to squat really speak to muscle strength and balance, good indicators of overall physical fitness. The ability to squat is really interesting because some women participate in exercise classes or go walking or whatever, but may not be maintaining their ability to squat as a result. Being able to squat to the floor indicates strong posture and balance; it decreases the risk of falling, and avoiding falls is critical for maintaining your health as you age. If you fall, you're likely to break something, and fractured hips lead to a 25 percent death rate in the first year. When you can squat, you have more core strength and a stronger pelvic floor; those stronger muscles in your lower body also help avoid incontinence issues. So that ability to squat is just a quick good measure to know how

you're doing with the lower part of your body. Having a strong grip is the upper body part; it is critical to your ability to take care of yourself. When your grip is strong you can carry groceries, work in your garden or do other things that require upper body strength and coordination.

Body Mass Index (BMI) is a measure that reflects the relationship between your weight and height. Healthy women have a BMI between 20 and 25. These women tend to do better life long, no matter what you're looking at. Whether you are looking at sexual function, heart disease, breast cancer risk or brain health, those with healthy BMIs do better. And in terms of death rates, you do better if you're within the normal range. We worry about people who have BMIs that are too high or too low. People with low BMIs can be extremely tiny and frail, often with lower bone density.

Q WHAT STEPS CAN WOMEN TAKE TO MAINTAIN A HEALTHY BMI?

A. I'll quote my daughter who is a dietician; she advises following an 80/20 rule. Eighty percent of the time, eat a healthy diet based on Canada's food guide. Have lots of fruits and vegetables, reasonable amounts of protein and reasonable amounts of >>

carbohydrates. Twenty percent of the time, you can relax a little bit and maybe have a piece of cake at somebody's birthday or something. The problem is that many people get the pattern reversed, so they're good 20 percent of the time and they're making excuses 80 percent of the time. Another simple rule to follow when it comes to healthy eating is to eat on a smaller plate and divide it into four portions: half of it should be vegetables, one-quarter should be carbohydrates and one-quarter should be protein. Physical activity is also important for maintaining a healthy BMI.

Q IS THERE ANY PARTICULAR TYPE OF PHYSICAL ACTIVITY THAT YOU RECOMMEND FOR HEALTHY AGING?

A. You need to do strength training of some sort to keep your bones strong and your upper body strong. And you need to do some form of aerobic exercise that elevates your heart rate for about 30 minutes. You'll know your heart rate is elevated because you'll get a bit sweaty and be a bit short of breath. Some people say, "oh, I walk the dog every day" but if your dog stops and starts, or you go to the dog park and mostly stand around, and you're never getting your heart rate up, then it's not enough. It may have benefits in terms of social connectedness but you're not getting the aerobic workout you need. I sometimes hear women say they have a very busy lifestyle that has them running all over the place. And to those women, I say hectic is not the same as aerobic. And when busy women tell me they just don't have the time to exercise. I say "what you are really saying to me is that it's not your priority." Then I share the analogy of flight attendants. They always tell you at the beginning of a flight, if the oxygen masks comes down, be sure to put it on yourself first, before you help the person beside you. So women taking care of themselves is not being selfish, it's being



DR. VIVIEN BROWN

WOMEN TAKING CARE OF THEMSELVES IS NOT BEING SELFISH, IT'S BEING SELFLESS.

selfless. It will ensure they stay healthy and able to take care of the people in their lives. That whole concept of creating time for yourself, making yourself a priority, is important not just for you but for your whole family. You can't always be last on the list.

Q BESIDES EXERCISE AND HEALTHY EATING, WHAT ELSE CAN WOMEN DO TO STAY HEALTHY AS THEY AGE?

A. A Canadian government study showed that social connectedness is really important. However old you are, if you're still playing bridge with your friends or going bowling, participating in your church group or

whatever it is that you do, you'll fare better than if you're isolated at home and becoming more and more withdrawn.

If you smoke, stop. This is very straightforward. There's not a single study out there that says smoking is OK. This is not up for discussion, this is not being investigated. We know that just one to two cigarettes a day doubles your risk of heart disease; there's no safe amount. And so I think without question, smoking is not just not acceptable. It is a significant risk factor.

In terms of alcohol, some studies show that the tannins in red wine have an antioxidant effect which can be beneficial. Moderation is key. The typical advice for women is to consume no more than one, occasionally two, drinks per day.

Q IS THERE OTHER ADVICE YOU THINK IT IS IMPORTANT FOR WOMEN TO KEEP IN MIND AS THEY STRIVE TO STAY HEALTHY AS THEY GET OLDER?

A. I like to tell people that medicine is a team sport. You and your doctor work in partnership to make good health decisions for you, along with the dieticians, physiotherapists, pharmacists and any other health care providers you're seeing. The patient is a key part of that team. Doctors can provide guidance but it is up to patients to make the changes in their lives. For example, I can tell my patients til the cows come home to stop smoking but if they go out and smoke, I can't fix it. The patient needs to not just follow instructions but be a fully engaged partner in their health care team. 🌐

Vivien Brown, MDCM, CCFP, FCFP, NCMP's Summary, Toronto family physician & Vice President of Medical Affairs for Medisys Health Group



DOES SEX MATTER?

Profoundly!" according to Dr. Pauline Maki.

Sex and gender definitely matter as we age. "Women with the strongest risk factor genetically for Alzheimer's Disease (AD) have a 50% increased risk of AD compared to the man next to her who has that same gene," said Dr. Maki.

Sadly, there remain huge gaps in our knowledge of why these differences exist. This is, in part, because clinical studies in some areas still tend to focus on men only. Also, there is still little research being done on how important social determinants of health affect older women and men differently. And finally, researchers often simply ignore older people in general when gathering data. For these reasons and others, aging women's health

is still emerging as an area of knowledge.

Uppermost in this thirst for knowledge is the quest to understand why so many of us are having trouble recalling names, book titles, appointments, and why we are struggling with midlife mental lapses.

WE DON'T KNOW WHY **WOMEN ARE MORE VULNERABLE TO MEMORY LOSS,** BUT THE NEUROSCIENCE COMMUNITY HAS SOME VERY GOOD HINTS.

According to Dr. Maki, we don't know why women are more vulnerable to memory loss, but the neuroscience community has some very good hints. Estrogen is responsible for a lot more bodily functions than we generally give it credit for, and its slow withdrawal from the body has a set of side

effects, among them a potential contributor to worsening memory. The Study of Women's Health Across the Nation (SWAN) measured cognitive performance during menopause transition. The SWAN study assessed verbal/episodic memory, logical memory and working memory. The study found the decline in memory during menopause is a

sign of abnormal cognitive function and not aging because improved memory returned after menopause.

A 2008 study at the University of Illinois found a link between hot flashes and poor verbal memory. The study followed other research that found about 40 per cent of women report becoming more forgetful around menopause. "The more hot flashes a woman had, the worse her memory performance," says Dr. Maki. Maki found >>

women whose hot flushes disturbed their sleep suffered even worse memory problems.

Researchers have also found that too much stress over a prolonged period interferes with the normal processes in storing everyday memories. "Previous studies have found that females are more resilient to chronic stress and now our research has found the reason why." Says Zhen Yan PhD., a professor in the Department of Physiology and Biophysics at the University of Buffalo School of Medicine and Biomedical Sciences. The research shows that in rats exposed to repeated episodes of stress, females respond better than males because of the protective effect of estrogen.

"When estrogen signaling in the brains of females was blocked, stress exhibited detrimental effects on them," explains Yan. "When estrogen signaling was activated in males, the detrimental effects of stress were blocked. "We still found the protective effect of estrogen in female rats whose ovaries were removed," says Yan. "It suggests that it might be estrogen produced in the

brain that protects against the detrimental effects of stress."

In another study, researcher Alexandra Ycaza of the University of Southern California found women with the highest estrogen levels performed well on recall tests while being subjected to varying levels of stress, while in contrast, women with the lowest estrogen levels performed worse.

The findings suggest that estrogen provides a natural buffer against the negative impact of stress on short-term memory in women, Ycaza said.

"However, it's not all bad news," says Maki. "We can control the negative affect of memory through stress reduction. Through yoga, exercise, and various practices of mindfulness - meditation techniques such as focused breathing and body awareness."

Dr. Pauline Maki says menopausal women tend to be much better than older people

at recognizing and assessing their memory deficits.

"It may be that women are generally more tuned in to bodily changes because so many changes are happening all at once," she said. 🧠

Pauline M. Maki, PhD, Professor of Psychiatry and Psychology, Director of Women's Mental Health Research in the Departments of Psychiatry and Psychology, University of Illinois at Chicago



CAN YOU PASS THIS ALZHEIMER'S QUIZ?

Pick one answer for each question.

1. Can you get Alzheimer's if no one in your family has had it?

- a) Yes – Anyone can develop the disease.
- b) No – Alzheimer's is purely genetic.
- c) No – a family member on your mother's side must have had Alzheimer's to put you at risk of developing it.

2. What's the most common early sign of Alzheimer's?

- a) Can't remember new information
- b) Can't remember old information
- c) Can't remember any information

3. What is the difference between Alzheimer's disease and dementia?

- a) Alzheimer's is progressive (gets worse with time) but dementia is not.
- b) Dementia is not as serious as Alzheimer's, it just affects memory.
- c) They are actually the same thing, just different names.
- d) Dementia is a general category and Alzheimer's is a specific type of brain failure.
- e) Alzheimer's is treatable, but dementia is not.

4. Can you prevent Alzheimer's?

- a) Yes – You can prevent Alzheimer's with a healthy diet.
- b) Yes – You can prevent Alzheimer's with brain exercises.
- c) No – you cannot prevent Alzheimer's.

5. Do people die from Alzheimer's?

- a) No – those with Alzheimer's usually die from other causes.
- b) Yes – Alzheimer's is ultimately a fatal disease.
- c) No – Alzheimer's is memory-impairment disease, not life-threatening in almost all cases.

6. These are all risk factors for Late Onset Alzheimer's. Which is the greatest known risk?

- a) Brain injury
- b) Increasing age
- c) Genetics
- d) Heart attack or stroke
- e) Stress
- f) Diet
- g) Diabetes
- h) Obesity

The quiz was created by Senior Helpers, a private in-home senior care provider.

Men's and women's brains are different. They differ in size. They differ in amounts of white and grey matter. And they appear to differ in how they age, with differences becoming most pronounced in older age. These differences can be seen using brain imaging technology. "New computerized methods allow precise measurement of the brain's structure, opening up new understanding of how the brain changes with age and how dementia affects women and men differently," explains Sandra Black, a neurology researcher affiliated with Sunnybrook Health Sciences Centre and University of Toronto.

SEX DIFFERENCES EVIDENT IN BRAIN IMAGING

WHAT'S DIFFERENT BETWEEN WOMEN'S & MEN'S BRAINS?

Black shares some of what we know about differences between men's and women's brains, thanks to brain imaging:

Premenopausal women have higher blood flow in their brains than men, thanks to high estrogen levels. After menopause, women's blood flow in the brain shifts to be similar to men's.

Women appear to have more serotonin receptors, which are associated with mood.

Packing cell density is higher in women in the language area, meaning they have more cells in a given amount of brain volume and the connectivity between the cells is more efficiently organized, perhaps explaining why, though the language area is smaller, women still tend to perform better on language tasks than men.

Since men tend to be larger in overall size than women, and have larger heads, it's not surprising that brain volume is bigger in men. When you control for head size, though, women actually have proportionately more grey matter (i.e., cerebral cortex). >>



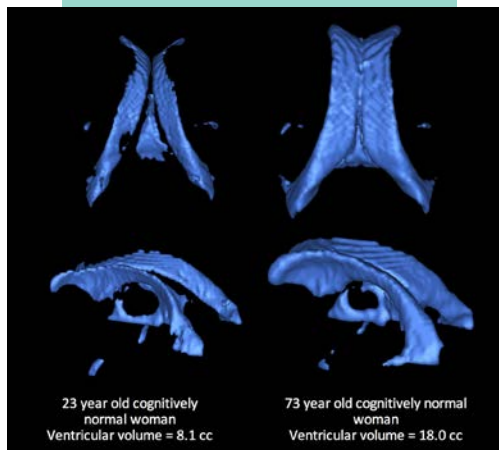
That last point about variations in head size is an important one. For analysis of brain imaging to be accurate when comparing across sexes, it is essential to make corrections for head size. To date, a lot of brain imaging work hasn't done that as carefully as it should.

BRAINS SHRINK RAPIDLY WITH ALZHEIMER'S

A healthy brain fills the space inside the skull. Over time, the brain shrinks much more rapidly when Alzheimer's disease is present. Brain imaging allows scientists to measure the amount of brain shrinkage by considering the volume of the brain itself as a percentage of the amount of space available inside the skull (the total intracranial vault volume); the resulting calculation is called the brain parenchymal fraction (BPF). BPF takes into account head size and makes it possible to compare across men and women. Women tend to have larger BPFs than men.

Further evidence of brain shrinkage is the enlarging of ventricles. Ventricles are spaces in the centre of the brain where ventricular cerebrospinal fluid is produced. As the brain shrinks, these enlarge - they are much bigger in Alzheimer's patients. Black points out that, "older men tend to show more generalized shrinkage of the brain as indicated by larger ventricles, relative to head size."

Current methods of brain imaging allow the brain to be segmented so that scientists can examine a particular part of the brain in isolation. The hippocampus is an interesting part to examine because of its importance for learning new information and forming short-term memories, and the fact that it is the first part of the brain to show signs of shrinking in Alzheimer's patients. If you look at hippocampal volume in men and women, and don't adjust for head size, it looks like men with Alzheimer's disease have significantly larger hippocampal volume than women with Alzheimer's.



However, once you adjust for head size, this difference disappears. There is not much difference in hippocampus shrinkage between men and women with Alzheimer's disease. So, in this area, we actually see a similarity between men and women.

SMALL VESSEL DISEASE MORE COMMON IN WOMEN

Brain imaging can also reveal different types of small vessel disease that may affect cognition. There are different ways small vessel disease can show up. One is blockages in small arteries in the brain, especially common in people with hypertension and diabetes. "With this type of blockage, there is a kind of remodeling taking place in the brain and you get twisted arteries," explains Black. The tiny arteries can end up completely blocked because they don't have any blood supply and you end up with a hole. That is called a silent stroke. Silent strokes are present in about 28 percent of the population over 65 and even though people are not aware they've had one, they are not benign. Silent strokes are associated with higher risk of experiencing dementia and having an overt stroke.

"The other way small vessel disease manifests in the body is through what we call White Matter Hyperintensities (WMH)," says Black. WMH shows up as tiny spots or patches that represent an area of circulatory failure that hasn't developed into a hole. "You get this hyperintense appearance on a

particular type of MRI scan," explains Black. WMH are much more prevalent than silent strokes. US data from brain imaging of 3500 people over 65 years old showed that WMH was present in 95% of the sample. "The presence of WMH tells us that the vessels are aging and parts of the brain are being hurt," says Black. "Just because WMH are so common doesn't mean they are benign. If you just have a little bit of WMH, it probably doesn't matter so much. But when you start to have large areas of them, it's becoming a more diffuse disease, which is more of a concern. And it looks like there is a tendency for women to have this more than men."

Small vessel disease in the brain is related to overall vascular health. To keep your brain healthy, you need to keep your heart and circulatory system healthy. So, that means eating well, exercising and managing things that impact heart health such as high blood pressure, obesity and diabetes. "So that means hypertension must be recognized even at age 20 or 30, and treated vigorously. We have good medicine now that can do that," urges Black.

A lot is known about how the brain works and how women's and men's brains differ, thanks to brain imaging. More research is needed to help us understand why these differences exist and how recommended treatments might be different for each sex. This is a complex topic with much more learning still ahead. 🌐



Sandra E. Black, O.Ont., MD, FRCP(C), FRSC, FAAN, FAHA Brill Chair in Neurology, Department of Medicine, Sunnybrook Health Sciences Centre & University of Toronto

STRESS REDUCTION MAY BE MODERN FOUNTAIN OF YOUTH

STRESS LEADS TO ACCELERATED AGING THAT AFFECTS CELLS THROUGHOUT YOUR BODY

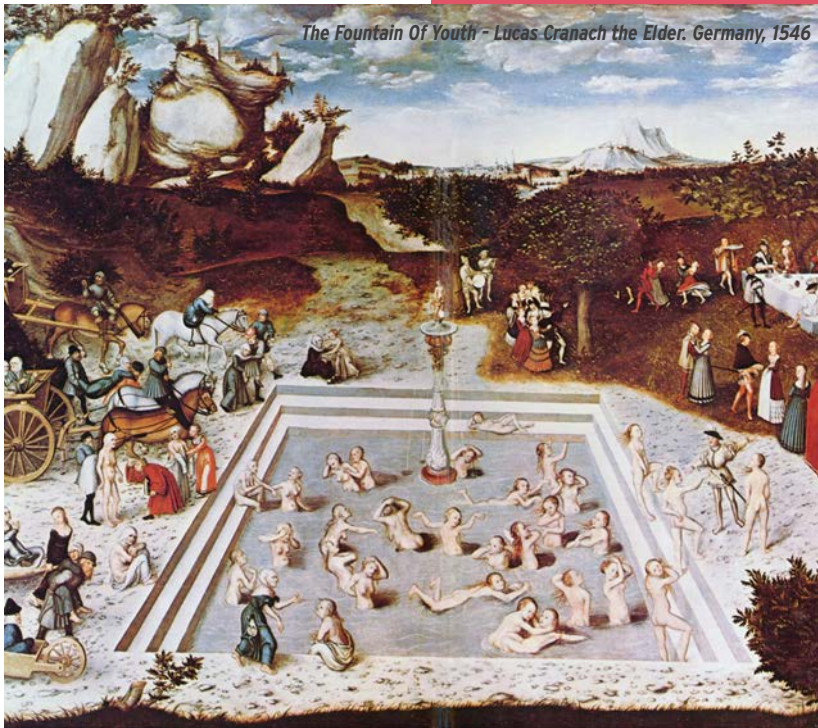
Throughout history, humans have demonstrated a fascination with the topic of aging. Stories about the Fountain of Youth abound. Tales have been told by various cultures across many centuries that anyone who drinks or bathes in the waters of the Fountain of Youth, as shown in the painting by Lucas Cranach the Elder (see page 14), will restore their youthful health and vigor. This fascination with the Fountain of Youth myth demonstrates the high motivation to identify factors that can reverse, or at least slow down, the process of aging.

"The process of aging itself cannot be avoided, and is an important, natural part of life," explains Jens Pruessner, an associate professor and researcher at McGill University. He goes on to provide hope, suggesting that "perhaps something can be done about age-related illness and disease, though." So, we can't avoid getting older but there might be ways to stay healthier and avoid sickness and disease as we age. Pruessner, the Director of the McGill Centre for Studies in Aging, leads research looking at one of

the main factors identified so far that leads to accelerated aging and increased risk of disease - stress.

THE DISCOVERY OF TELOMERES

To understand the role of stress on health as we age, we first need to consider what is happening in the body as we age that leads to sickness and disease. Both the aging process itself and age-related diseases have to do with something called telomeres which are molecular caps at the end of our chromosomes, much like the caps on the ends of shoelaces. Research by Nobel Prize winner Elizabeth Blackburn showed that every time a cell divides and duplicates our DNA information, a little bit of this telomere gets chopped off. So, telomeres get shorter and shorter each time the cells divide. When telomeres are used up, the cell can no longer divide and then it dies. "So telomeres are kind of like an internal clock inside our cells," explains Pruessner, "giving each cell a certain life span." >>



The Fountain Of Youth - Lucas Cranach the Elder. Germany, 1546

Clearly, there is a consistent decline of telomeres with normal aging. However, there is significant variation in how quickly telomeres are used up and cells die. Some people's telomeres get shorter sooner than they should given their age; they show signs of accelerated aging. Why? Among the various environmental factors that can contribute to accelerated shortening of telomeres, stress stands out as one of the most important.

TELOMERES PROVIDE EVIDENCE OF ACCELERATED AGING

A team of researchers from University of California - San Francisco conducted a study comparing the telomere length of two groups of women: (1) women with healthy children; and (2) women with a chronically ill child. As telomere length was measured over time, the study revealed that the women with chronically ill children, dealing with high levels of chronic stress, had telomere lengths equivalent to someone 10 years older. Chronic stress had accelerated the aging of their telomeres by a decade.

The research on telomeres makes it clear that stress leads to accelerated aging that

affects cells throughout your body. But, what exactly is stress? Pruessner explains, "Stress is typically defined as an increased demand on the individual brought on by a change in the environment. Our bodies react to this change in demand with increased activity in a number of systems that allow us to mobilize energy to cope with the challenge or threat." Our physiological system reacts, releasing adrenaline as we experience the 'fight or flight' response. Our endocrine system also reacts by releasing a hormone from the adrenal cortex, cortisol, providing a second energy boost to help with coping during acute stress. In the long term, however, it is the hormone cortisol that has been linked to an accelerated shortening of the telomeres and thus to accelerated aging, and the possibility of sickness and disease.

THE IMPACT OF CORTISOL

The effects of stress, and exposure to the stress hormone cortisol, have also been studied by Robert Sapolsky of Stanford University. He discovered that many disease states are associated with high amounts of cortisol being released and that the longer the excessive cortisol release goes on,

the more the brain and body are affected. Sapolsky's work concentrated on the hippocampus, an important part of the brain that is associated with memory formation and learning; it is a part of the brain that is known to shrink with dementia.

"We know that women are more prone to age-related disease and that this imbalance becomes even more pronounced when you look at brain diseases, specifically Alzheimer's, which is the leading neurodegenerative disease in old age," states Pruessner.

WOMEN RESPOND MORE STRONGLY TO SOCIAL STRESS

Stress might be directly related to this increase in chronic illness in women in the later parts of their lives. Pruessner refers to two studies that provide possible explanations for this. In one study, women responded more strongly to certain types of stress, namely social stress. Their bodies showed signs of higher stress, including increased release of cortisol, in response to stressful situations that involved a social component (e.g., presenting in front of an all male audience) compared to men's lower responses to the reverse situation (e.g. presenting to an all female audience). Later studies revealed that women's responses to stress also vary depending on the amount of estrogen present in their bodies. Women in the follicular phase of their menstrual cycle, when estrogen levels are highest, or women using estrogen-containing oral contraceptives, show lower levels of cortisol in response to stress, compared to women in the luteal phase of their menstrual cycle when estrogen levels are lowest. So, estrogen buffers the effects of stress, reducing the amount of cortisol released.

"Of course that is only true as long as you have estrogen in your system. This could explain why we see a shift to more women than men experiencing age-related disease, particularly brain disease, after 50 years of age, because that's typically when women enter menopause," explains Pruessner.

THE ROLE OF ESTROGEN

Pruessner shares an interesting, little known fact about estrogen: “Both men and women have estrogen in their bodies; while estrogen is produced by the ovaries in women, in men, part of the testosterone produced by the testicles gets converted to estrogen. This is probably because this hormone serves important functions, especially in the brain.” Women only have more estrogen than men until menopause. After menopause, women’s estrogen levels drop dramatically because their ovaries stop producing estrogen, while in men, the conversion of testosterone to estrogen continues life-long.

So, if estrogen can help minimize the effects of stress by decreasing the cortisol response and protecting the hippocampus

That World Health Organization recommendation has been revisited since, in numerous articles. The latest analysis points to the need for further research before reaching a final conclusion about the risks versus benefits of HRT. It will be important to consider different forms of HRT and dosages. The original study looked at one particular type of estrogen therapy which was derived from horse hormones and it is thought that that type of HRT might have at least in part contributed to the negative effects. Whether estrogen is used on its own, or in combination with progesterone, is known to have a significant effect on outcomes as well. And the timing of HRT administration (i.e. patient’s age during treatment), and the

So how do you avoid perceiving situations as stressful? Pruessner recommends activities that allow your mind to rest and recuperate, for example meditation or yoga, which have been shown to reduce stress. The important thing is for people to find a stress-reducing activity that works for them. Jogging outdoors is Pruessner’s personal choice for stress reduction. Pruessner describes, “what I find great about jogging is that while you’re obviously exercising your body, you are allowing your mind to rest as well; you let go, you’re not working on anything. To me, the mind part of jogging is as powerful as the physical part.”

Unfortunately no one has found the Fountain of Youth to reverse the effects of aging. “It’s not quite that easy,” Pruessner says. Then he jokes, “If you find that fountain,

WOMEN’S RESPONSES TO STRESS ALSO VARY DEPENDING ON THE AMOUNT OF ESTROGEN PRESENT IN THEIR BODIES.

and other parts of the brain, one might expect hormone replacement therapy (HRT) using estrogen to prevent cognitive decline in post-menopausal women. That is, in fact, what has been observed. Multiple studies of hormone replacement therapy supplementing estrogen after menopause have shown positive impacts on brain health, i.e. reduced risk of dementia, larger hippocampal volume, and increases in cognitive function.

All of this is a powerful argument that estrogen should be very good as a treatment, however there has been “quite a controversy surrounding the use of hormone replacement therapy including estrogens,” Pruessner points out. A study that was published in 2002 by the World Health Organization showing an increased risk of breast cancer, blood clots in the veins, and bladder infection with HRT recommended that women stop using HRT. Not surprisingly, use of HRT has plummeted dramatically since.

amount and the frequency with which HRT is used, all seem to play a role as well.

“The more you are able to mimic the naturally occurring menstrual cycle, in giving dosed HRT, the more you might be able to avoid any of the negative effects and just gain the beneficial effects. And I think this is where research is currently heading,” says Pruessner.

REDUCING STRESS NATURALLY

A lot can be done to minimize stress, and reduce cortisol in your body, naturally. Cortisol regulation is coordinated by the brain so your cortisol levels are affected by the way you approach your life and your perception of potentially stressful situations. Pruessner points out that “if you don’t perceive something as so stressful then you will not get the same amount of cortisol released in response to that situation.”

do let me know. I’d like to take a bath myself.” In the meantime, remember that taking steps to reduce stress in your life can certainly help to keep your body and brain healthy longer, giving you at least in part the benefits of the Fountain of Youth. 🌿



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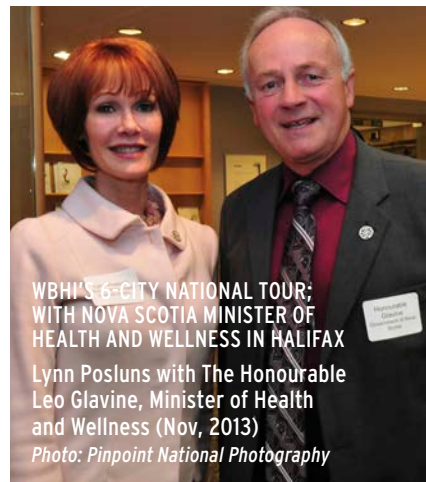


HUFFINGTON POST FOUNDER SPEAKS ON BEHALF OF WBHI
 (L-R) Lynn Posluns, event host Indigo's Heather Reisman, WBHI Board Chair & Twitter Canada's Kirstine Stewart; media mogul Arianna Huffington (Sept, 2013)
 Photo: George Pimental Photography

What a fabulous year it's been for WBHI. Founder & President Lynn Posluns has spoken at dozens of public and media events to share the women's brain health story.



QUEEN'S PARK LAUNCH
 (L-R) Dr. Helena Jaczek, MPP & Parliamentary Assistant to the Minister of Health & Long-Term Care (HLTC), Christine Elliot, MPP, PC HLTC Critic, Lynn Posluns, & France Gelinas, MPP, NDP HLTC Critic (Oct, 2013)
 Photo: Arthur Mola



WBHI'S 6-CITY NATIONAL TOUR; WITH NOVA SCOTIA MINISTER OF HEALTH AND WELLNESS IN HALIFAX
 Lynn Posluns with The Honourable Leo Glavine, Minister of Health and Wellness (Nov, 2013)
 Photo: Pinpoint National Photography

BRAIN BUZZ

WOMEN'S BRAIN HEALTH INITIATIVE ON THE MOVE



PARLIAMENT HILL LAUNCH
 The Honourable Rona Ambrose, Minister of Public Works & Minister for Status of Women, The Honourable Senator Linda Frum, host WBHI Founder & President Lynn Posluns (May, 2013)
 Photo: Pinpoint National Photography



WOMEN OF INFLUENCE - WOMEN & HEALTH PANEL
 Lynn was a panelist in the Women of Influence Health luncheon series across Canada. (L-R) Panelist Leslie Beck RD, Lynn Posluns WBHI President, Moderator Dr. Marla Shapiro, Emcee & CTV News Anchor Marcia Macmillan, Panelist & WBHI Board Member Dr. Vivien Brown (Mar, 2014)
 Photo: Tom Sandler Photo womenofinfluence.ca

Chronic stress, and the persistently high levels of cortisol it produces, wreaks havoc on our entire body. Chronically high cortisol has been linked to high blood pressure, increased abdominal fat deposits, heartburn, gastric ulcers and compromised immune system functioning. It has also been linked to shrinkage of the hippocampus (the part of our brain responsible for retaining new information) and increased risk of Alzheimer's disease. Clearly there are many good reasons to do whatever it takes to reduce chronic stress in our lives. This is especially true for caregivers of loved ones with dementia, who often experience high levels of stress over long periods of time. When someone with dementia relies on you, the burden can be overwhelming and it can feel like there is no way to avoid stress. Chronic stress is so rampant in our culture that it

seems normal. When everyone around you is stressed out, it can feel like that's just the way things are, making it tempting to resign ourselves to lives of hectic unbalance. But it doesn't have to be that way. Even if you believe there is no way for you to reduce the stressors you face, you can incorporate stress management tools into your life to help you handle the stressors better and reduce the negative health effects of exposure to chronic stress. Yoga is one such tool.

YOGA PROVIDES NUMEROUS BENEFITS

Because yoga incorporates multiple practices - physical postures, breathwork, and meditation - it is a comprehensive approach that is ideal for stress management. Studies have shown that practicing yoga is as-

sociated with numerous physiological and psychological benefits including positive effects on cognitive activity, lower cortisol levels, lower blood pressure and improvements in depression.

THERE'S A STYLE OF YOGA FOR EVERYONE

There are many different styles of yoga to choose from and there is wide variation among teachers of any given style. Some classes are vigorous with flowing movement or long holds. Some classes are moderate in intensity, while others are extremely gentle. For people that have mobility challenges, perhaps being unable to get up and down off the floor, there are even chair yoga classes. "Yoga is growing in popularity but it's unfortunate that there are misconceptions about yoga that keep some people >>

**MOVE & MEDITATE
TO MELLOW OUT**

from trying it,” says yoga instructor, Stephanie Hahn, based in Waterloo Region. “For example, some people perceive yoga as being for women, while other people claim to not be flexible enough to do yoga. I believe that there is a style of yoga for everyone - men and women, and especially for people lacking flexibility. Someone wise once said that saying you’re not flexible enough to do yoga is like saying you’re not dirty enough to take a bath.”

“Try out a variety of classes with different instructors to find one that you enjoy so that you are more likely to do it regularly,” advises Hahn. And regularity of practice is important.

You will certainly benefit from practicing as little as once a week, but research shows that multiple sessions each week, or even daily sessions, are likely more effective at providing therapeutic benefit.

“Going out to a class can provide structure and motivation, and teach you to practice yoga safely, which is especially important for beginners. After attending classes for a while, many students have picked up a lot that they can then practice at home between classes,” explains Hahn. Many yoga instructors offer private sessions, if you’d prefer not to learn in a group environment. There are also many great books, DVDs and online content to support a home yoga practice, making it convenient and affordable.

MEDITATION CAN BE AN EFFECTIVE TOOL ON ITS OWN

While meditation is often done as part of a comprehensive yoga practice, there are many people who practice various forms of meditation on its own. “Meditation is one of the most effective ways to rapidly induce a deeply restful state. It can be integrat-

GIVE YOURSELF THE GIFT OF A GUILT-FREE PAUSE EVERY DAY



Most people in our fast-paced culture do not allow themselves the “luxury” of a rest during the day. Meditation practice offers a structured form of rest with numerous health benefits. “It’s important to realize that meditation is not the same as resting with your eyes closed. Research has shown that the physiology of meditation differs from that experienced with ordinary rest. It’s been called ‘falling awake’ in recognition of the fact that even though your body is relaxed and your mind is calm, there is still an active component to what’s going on,” explains Hahn. “It’s time that our culture redefines rest, understanding it is a necessity each day, not a luxury, so that everyone can discover the power of a guilt-free pause every day - whether they choose to practice meditation or yoga.

ed into anyone’s life since it can be learned quickly, doesn’t have to take much time, and doesn’t require mobility or physical fitness. It can be learned under the guidance of a meditation teacher in a group class or a private session, or it can be practiced at home using audio recordings,” explains Hahn.

Several studies have shown improved cognitive function among regular meditators. One example is research by H.G. Yucel in 2001 with elderly persons, showing that meditation had beneficial effects on their memory. In addition to the direct impact meditation can have on the brain, there are many additional benefits for brain health through reduction of risk factors for dementia

such as high blood pressure, cholesterol, blood sugar and depression.



TYPES OF MEDITATION

There are different types of meditation, which can be divided into two broad categories:

Concentrative meditation directs your attention to a single unchanging or repetitive stimulus, to help you let go of thoughts and quiet your mind. Examples include repeating a sound in your mind (mantra), watching your breath, or gazing at a candle flame. Transcendental meditation is a well known form of mantra meditation.

Non-concentrative meditation cultivates mindfulness, the ability to bring a non-judgmental, sustained awareness to your thoughts, simply observing what comes into your mind without reacting to it. This type of meditation is also referred to as ‘insight meditation’ or ‘Vipassana practice.’ Jon Kabat-Zinn’s Mindfulness-Based Stress Reduction (MBSR) program is a well known and extensively studied example of mindfulness practice. 🧘

MY DISAPPEARING MOTHER:

LEARNING TO ACCEPT THE IMPACT OF DEMENTIA

AS TOLD BY DEBBIE WANLESS

We never suspected my mother was suffering from the insidious disease of dementia. So much of our realization ended up being in hindsight, probably because my parents really were so independent and compensated for each other.

Just over a decade ago my parents, Ross and Grace, were alive and well. They were healthy and living independently until around age 80. I can easily recall how family would always go over to their home for meals every week. Our family was always very close and mom would cook a feast for us that included delectable desserts that were handcrafted to perfection. The house was always well kept with my parents handling all the housework, landscaping and snow removal independently. Even late into their senior years both were active community volunteers in the church and the local Meals on Wheels.

However, shortly after 2001 when we learned my father had Parkinson's, it came to light that my mother was also suffering from her own illness, dementia.

When I look back, there were no obvious signs that my mother was struggling. Sure, there were times when my dad would sometimes be short with her and say "I already told you that!" but we just dismissed it as him being cranky.

Everything changed drastically as my father's health waned. Our parents' marriage was a traditional one in which he dealt with all the finances. When his health declined rapidly, he believed it was best for my sister Verna and I to get things in order so he gave us financial power of attorney. When we were asked to step in, we told ourselves it was because it was too much for our mother at the time and she couldn't cope with everything that was going on. Now that I look back she probably didn't have the cognitive ability at that point and my father may have been aware of that.

Once my father passed away my mother moved into an apartment, living alone for the first time. Isolated, her cognitive decline came to the forefront. She became depressed. Her short-term memory started to wane and we noticed she'd repeat herself often. She'd cook meals and forget to turn off the stove and eventually we had to get the stove disconnected because we were concerned for her safety. My sister and I then decided it was best to move our mother to an independent living facility for seniors, but her condition continued to decline. She was no longer able to prepare her own meals and live the life that she ought to have. It was hard to accept that neither of us could provide the 24/7 care that she now needed at home, and we knew we had to do what was best for her. That's when we made the difficult decision to move her into a long-term care facility.


At age 60, I can't devote attention to my


own future, as I have to focus on my mother's needs in the here and now. My family and I live an hour away from my mother so we have to plan ahead in order to have one day available every week for visiting. My mother's demeanor is usually quite pleasant but the visits are still emotionally draining. For example, I work as a music administrator and publisher but she still remembers me as a studio teacher, something I did many years ago. So she'll ask me about my teaching over and over. It's hard not having my mother know who I am and what I do today. I do feel badly getting frustrated with her because she doesn't know what she's doing. So I often bring our dog to visit, which serves as both a source of happiness for her and a diversion from repetitive questions.


I speak to my mother every day on the phone, but we don't really get to have conversations anymore. "Hi, how are you? What are you doing? What did you have for dinner?" That's about it. It's become quite minimal. I really do miss being able to talk to my mother about my family and how everyone's life is going - she just doesn't remember any of them anymore. She doesn't even know anything is wrong.


There's profound sadness in watching my mother, who was once so lively, capable, and herself a remarkable caregiver, go to just basically existing and in need of constant care. The loss happened gradually and with it came the understanding that this isn't my mom anymore. I kind of detached and shifted into caregiver mode. Now I focus on being very realistic and practical. I have to in order to give the care to my mother that she deserves. There's not a lot of joy in what we share with her at this point - there isn't for her either. There used to be joy. 🌱


DID YOU KNOW?


 Few people associate memory with the heart, but they are related. The healthier the heart, the healthier the brain.


 Certain types of mental exercises – simply from memory games on your mobile device to jotting down letters backward – might help our grey matter maintain concentration and memory over the years.


 Moderate lifetime activity for 3-4 hours per week reduces your risk of developing Alzheimer's and is associated with better abilities for tasks.


 Stress may cause women's brains to age prematurely.


 Senior women with sleep apnea may have an increased dementia risk.

 A person's walking ability or type of gait may give hints about oncoming Alzheimer's disease.

 Early onset of Type 2 diabetes increases the chances of developing Alzheimer's disease earlier. Like the pancreas, the brain produces insulin and researchers believe Alzheimer's develops when the brain becomes insulin-resistant.

 If your mother, rather than your father, has Alzheimer's, it increases your vulnerability of developing it.

 Now you don't have to feel guilty about pouring yourself another cup. There is substantial evidence that caffeine is protective against neurodegenerative diseases like Parkinson's or Alzheimer's disease.

 Thyroid levels tend to go down as we age, and hypothyroidism is common among the elderly. Warning signs include slower thinking and symptoms of depression. Lower thyroid levels can increase women's risk of developing Alzheimer's.

Smoking can cause oxidative stress in the brain of the same magnitude as Alzheimer's disease itself.



ALMOST 70% OF NEW ALZHEIMER'S SUFFERERS WILL BE WOMEN.

YOU CAN'T IGNORE A NUMBER THIS BIG. HELP US DO SOMETHING ABOUT IT. **PLEASE GIVE GENEROUSLY.**



Women's Brain Health Initiative

Yes! I'd like to support the Women's Brain Health Initiative now with my gift of:

\$2,000 \$1,000 \$500
 \$250 \$100 Other \$_____

I have enclosed a cheque payable to Women's Brain Health Initiative
 I prefer to use my credit card

You can also donate online at womensbrainhealth.org/donate

DONOR NAME

ADDRESS

ADDRESS

CREDIT CARD NUMBER

EXPIRY DATE: MM/YY

CVD

NAME ON CREDIT CARD

E-MAIL

SIGNATURE

IS THIS NORMAL?

10 SIGNS OF DEMENTIA

1

MEMORY LOSS THAT DISRUPTS DAILY LIFE.

- › Forgetting recently learned information
- › Forgetting important dates or events
- › Asking for the same information over and over

What's typical?
Sometimes forgetting names or appointments, but remembering them later.

2

CHALLENGES IN PLANNING OR SOLVING PROBLEMS.

- › Trouble following a familiar recipe
- › Trouble keeping track of monthly bills
- › Taking much longer to do things that used to be routine

What's typical?
Making occasional errors when balancing a checkbook.

3

DIFFICULTY COMPLETING FAMILIAR TASKS AT HOME, AT WORK OR AT LEISURE.

- › Trouble driving to a familiar location
- › Trouble managing a budget at work
- › Unable to remember the rules of a favourite game

What's typical?
Occasionally needing help to use the settings on a microwave or to record a television show.

4

CONFUSION WITH TIME OR PLACE.

- › Losing track of dates, seasons and the passage of time
- › Forgetting where you are or how you got there

What's typical?
Getting confused about the day of the week but figuring it out later.

5

TROUBLE UNDERSTANDING VISUAL IMAGES AND SPATIAL RELATIONSHIPS.

- › Difficulty judging distance and determining colour or contrast
- › Passing a mirror and thinking someone else is in the room
- › Not recognizing your own reflection in a mirror

What's typical?
Vision changes related to cataracts.

6

NEW PROBLEMS WITH WORDS IN SPEAKING OR WRITING.

- › Trouble following or joining a conversation
- › Struggling with vocabulary - finding the right word or call things by the wrong name
- › Stopping in the middle of a conversation and having no idea how to continue

What's typical?
Sometimes having trouble finding the right word.

7

MISPLACING THINGS AND LOSING THE ABILITY TO RETRACE STEPS.

- › Putting things in unusual places
- › Losing things and unable to go back over their steps to find them again
- › Accusing others of stealing.

What's typical?
Misplacing things from time to time, such as a pair of glasses or the remote control.

8

DECREASED OR POOR JUDGMENT.

- › Giving large amounts of money to telemarketers
- › Paying less attention to grooming or keeping yourself clean

What's typical?
Making a bad decision once in a while.

9

WITHDRAWAL FROM WORK OR SOCIAL ACTIVITIES.

- › Removing yourself from hobbies, social activities, work projects or sports
- › Having trouble keeping up with favourite sports team

Avoiding being social
What's typical?
Sometimes feeling weary of work, family and social obligations.

10

CHANGES IN MOOD AND PERSONALITY.

- › Becoming confused, suspicious, depressed, fearful or anxious
- › Easily upset at home, at work, or with friends
- › Need to stay in your comfort zone

What's typical?
Developing very specific ways of doing things and becoming irritable when a routine is disrupted.

10 DRUGS THAT MAY CAUSE MEMORY LOSS

Reprinted with permission from the author
Dr. Armon B. Neel Jr., PharmD, CGP, Griffin, Georgia



ARE YOU HAVING TROUBLE REMEMBERING THINGS? ONE OF THESE MEDS MAY BE THE PROBLEM.

For a long time doctors dismissed forgetfulness and mental confusion as a normal part of aging. But scientists now know that memory loss as you get older is by no means inevitable. Indeed, the brain can grow new brain cells and reshape their connections throughout life.

Most people are familiar with at least some of the things that can impair memory, including alcohol and drug abuse, heavy cigarette smoking, head injuries, stroke, sleep

deprivation, severe stress, vitamin B12 deficiency, and illnesses such as Alzheimer's disease and depression.

But what many people don't realize is that many commonly prescribed drugs also can interfere with memory. Here are 10 of the top types of offenders.

1 ANTIANXIETY DRUGS (BENZODIAZEPINES)

Why they are prescribed: Benzodiazepines are used to treat a variety of anxiety disorders, agitation, delirium and muscle

spasms, and to prevent seizures. Because benzodiazepines have a sedative effect, they are sometimes used to treat insomnia and the anxiety that can accompany depression.

Examples: Alprazolam (Xanax), chlordiazepoxide (Librium), clonazepam (Klonopin), diazepam (Valium), flurazepam (Dalmane), lorazepam (Ativan), midazolam (Versed), quazepam (Doral), temazepam (Restoril) and triazolam (Halcion).

How they can cause memory loss: Benzodiazepines dampen activity in key parts of the brain, including those involved in the transfer of events from short-term to long-term memory. Indeed, benzodiazepines are used in anesthesia for this very reason.

When they're added to the anesthesiologist's cocktail of meds, patients rarely remember any unpleasantness from a procedure. Midazolam (Versed) has particularly marked amnesic properties.

Alternatives: Benzodiazepines should be prescribed only rarely in older adults, in my judgment, and then only for short periods of time. It takes older people much longer than younger people to flush these drugs out of their bodies, and the ensuing buildup puts older adults at higher risk for not just memory loss, but delirium, falls, fractures and motor vehicle accidents.

If you take one of these meds for insomnia, mild anxiety or agitation, talk with your doctor or other health care professional about treating your condition with other types of drugs or nondrug treatments. If you have insomnia, for instance, melatonin might help. Taken before bedtime in doses from 3 to 10 mg, melatonin can help to reestablish healthy sleep patterns.

Be sure to consult your health care professional before stopping or reducing the dosage of any benzodiazepine. Sudden withdrawal can trigger serious side effects, so a health professional should always monitor the process.

2 CHOLESTEROL-LOWERING DRUGS (STATINS)

Why they are prescribed: Statins are used to treat high cholesterol.

Examples: Atorvastatin (Lipitor), fluvastatin (Lescol), lovastatin (Mevacor), pravastatin (Pravachol), rosuvastatin (Crestor) and simvastatin (Zocor).

How they can cause memory loss: Drugs that lower blood levels of cholesterol may impair memory and other mental processes by depleting brain levels of cholesterol as well. In the brain, these lipids are vital to the formation of connections between nerve cells – the links underlying memory and learning. (The brain, in fact, contains a

quarter of the body's cholesterol.)

A study published in the journal *Pharmacotherapy* in 2009 found that three out of four people using these drugs experienced adverse cognitive effects “probably or definitely related to” the drug. The researchers also found that 90 percent of the patients who stopped statin therapy reported improvements in cognition, sometimes within days. In February 2012, the Food and Drug Administration ordered drug companies to add a new warning label about possible memory problems to the prescribing information for statins.

Alternatives: If you're among the many older North Americans without known coronary disease who are taking these drugs to treat your slightly elevated LDL (“bad”) cholesterol and low HDL (“good”) cholesterol, ask your doctor or other health care provider instead about taking a combination of sublingual (under-the-tongue) vitamin B12 (1,000 mcg daily), folic acid (800 mcg daily) and vitamin B6 (200 mg daily).

3 ANTISEIZURE DRUGS

Why they are prescribed: Long used to treat seizures, these medications are increasingly prescribed for nerve pain, bipolar disorder, mood disorders and mania.

Examples: Acetazolamide (Diamox), carbamazepine (Tegretol), ezogabine (Potiga), gabapentin (Neurontin), lamotrigine (Lamictal), levetiracetam (Keppra), oxcarbazepine (Trileptal), pregabalin (Lyrica), rufinamide (Banzel), topiramate (Topamax), valproic acid (Depakote) and zonisamide (Zonegran).

How they can cause memory loss: Anticonvulsants are believed to limit seizures by dampening the flow of signals within the central nervous system (CNS). All drugs that depress signaling in the CNS can cause memory loss.

Alternatives: Many patients with seizures do well on phenytoin (Dilantin), which has little, if any impact on memory. Many pa-

tients with chronic nerve pain find that venlafaxine (Effexor) – which also spares memory – alleviates their pain.

4 ANTIDEPRESSANT DRUGS (TRICYCLIC ANTIDEPRESSANTS)

Why they are prescribed: TCAs are prescribed for depression and, increasingly, anxiety disorders, eating disorders, obsessive-compulsive disorder, chronic pain, smoking cessation and some hormone-mediated disorders, such as severe menstrual cramps and hot flashes.

Examples: Amitriptyline (Elavil), clomipramine (Anafranil), desipramine (Norpramin), doxepin (Sinequan), imipramine (Tofranil), nortriptyline (Pamelor), protriptyline (Vivactil) and trimipramine (Surmontil).

How they can cause memory loss: About 35 percent of adults taking TCAs report some degree of memory impairment and about 54 percent report having difficulty concentrating. TCAs are thought to cause memory problems by blocking the action of serotonin and norepinephrine – two of the brain's key chemical messengers.

Alternatives: Talk with your health care provider about whether nondrug therapies might work just as well or better for you than a drug. You might also want to explore lowering your dose (the side effects of antidepressants are often dose-related) or switching to a selective serotonin/norepinephrine reuptake inhibitor (SSRI/SNRI). Of the drugs in this category, I find venlafaxine (Effexor) to have the fewest adverse side effects in older patients.

5 NARCOTIC PAINKILLERS

Why they are prescribed: Also called opioid analgesics, these medications are used to relieve moderate to severe chronic pain, such as the pain caused by rheumatoid arthritis.

Examples: Fentanyl (Duragesic), hydrocodone (Norco, Vicodin), hydromorphone (Dilaudid, >>

Exalgo), morphine (Astramorph, Avinza) and oxycodone (OxyContin, Percocet). These drugs come in many different forms, including tablets, solutions for injection, transdermal patches and suppositories.

How they can cause memory loss: These drugs work by stemming the flow of pain signals within the central nervous system and by blunting one's emotional reaction to pain. Both these actions are mediated by chemical messengers that are also involved in many aspects of cognition. So use of these drugs can interfere with long- and short-term memory, especially when used for extended periods of time.



Alternatives: In patients under the age of 50 years, nonsteroidal anti-inflammatory drugs (NSAIDs) are the frontline therapy for pain. Unfortunately, NSAID therapy is less appropriate for older patients, who have a much higher risk of dangerous gastrointestinal bleeding. Research shows the risk goes up with the dosage and duration of treatment.

Talk with your doctor or other health care provider about whether tramadol (Ultram), a nonnarcotic painkiller, might be a good choice for you. In my practice, I often recommend supplementing each 50 mg dose with a 325 mg tablet of acetaminophen (Tylenol). While there are prescription drugs that combine tramadol and acetaminophen, these products have only 37.5 mg of tramadol, and in my practice I've found that patients generally need the larger dose.

6 PARKINSON'S DRUGS (DOPAMINE AGONISTS)

Why they are prescribed: These drugs are used to treat Parkinson's disease, certain pituitary tumors and, increasingly, restless legs syndrome (RLS).

Examples: Apomorphine (Apokyn), pramipexole (Mirapex) and ropinirole (Requip).

How they can cause memory loss: These meds activate signaling pathways for dopamine, a chemical messenger involved in many brain functions, including motivation, the experience of pleasure, fine motor control, learning and memory. As a result, major side effects can include memory loss, confusion, delusions, hallucinations, drowsiness and compulsive behaviors such as overeating and gambling.

Alternatives: If you are being treated for RLS, ask your doctor or pharmacist whether one of your prescription or over-the-counter medications may be the trigger. Potential culprits include many antinausea and antiseizure medications, antipsychotic drugs with tranquilizing effects, some antidepressants, and some cold and allergy medications. In this case, your RLS – and memory problems – could potentially be resolved by simply replacing the offending medication with another drug.

7 HYPERTENSION DRUGS (BETA-BLOCKERS)

Why they are prescribed: Beta-blockers slow the heart rate and lower blood pressure and typically are prescribed for high blood pressure, congestive heart failure and abnormal heart rhythms. They're also used to treat chest pain (angina), migraines, tremors and, in eyedrop form, certain types of glaucoma.

Examples: Atenolol (Tenormin), carvedilol (Coreg), metoprolol (Lopressor, Toprol), propranolol (Inderal), sotalol (Betapace), timolol (Timoptic) and some other drugs whose chemical names end with “-olol.”

How they can cause memory loss: Beta-blockers are thought to cause memory problems by interfering with (“blocking”) the action of key chemical messengers in the brain, including norepinephrine and epinephrine.

Alternatives: For older people, benzothiazepine calcium channel blockers, another type of blood pressure medication, are often safer and more effective than beta-blockers. If the beta-blocker is being used to treat glaucoma, I recommend talking with your health care professional about potentially using a carbonic anhydrase inhibitor, such as dorzolamide (Trusopt), instead.

8 SLEEPING AIDS (NONBENZODIAZEPINE SEDATIVE-HYPNOTICS)

Why they are prescribed: Sometimes called the “Z” drugs, these medications are used to treat insomnia and other sleep problems. They also are prescribed for mild anxiety.

Examples: Eszopiclone (Lunesta), zaleplon (Sonata) and zolpidem (Ambien).

How they can cause memory loss: Although these are molecularly distinct from benzodiazepines (see No. 1 above), they act on many of the same brain pathways and chemical messengers, producing similar side effects and problems with addiction and withdrawal.

The “Z” drugs also can cause amnesia and sometimes trigger dangerous or strange behaviors, such as cooking a meal or driving a car – with no recollection of the event upon awakening.

Alternatives: There are alternative drug and nondrug treatments for insomnia and anxiety, so talk with your health care professional about options. Melatonin, in

doses from 3 to 10 mg before bedtime, for instance, sometimes helps to reestablish healthy sleep patterns.

Before stopping or reducing the dosage of these sleeping aids, be sure to consult your health care professional. Sudden withdrawal can cause serious side effects, so a health professional should always monitor the process.

9 INCONTINENCE DRUGS (ANTICHOLINERGICS)

Why they are prescribed: These medications are used to relieve symptoms of overactive bladder and reduce episodes of urge incontinence, an urge to urinate so sudden and strong that you often can't get to a bathroom in time.

Examples: Darifenacin (Enablex), mirabegron (Myrbetriq), oxybutynin (Ditropan XL, Gelnique, Oxytrol), solifenacin (Vesicare), tolterodine (Detrol) and trospium (Sanctura). Another oxybutynin product, Oxytrol for Women, is sold over the counter.

How they can cause memory loss:

These drugs block the action of acetylcholine, a chemical messenger that mediates all sorts of functions in the body. In the bladder, anticholinergics prevent involuntary contractions of the muscles that control urine flow. In the brain, they inhibit activity in the memory and learning centers. The risk of memory loss is heightened when the drugs are taken for more than a short time or used with other anticholinergic drugs.

A 2006 study of oxybutynin ER, for example, found its effect on memory to be comparable to about 10 years of cognitive aging. ("In other words," as the study's lead author put it, "we transformed these people from functioning like 67-year-olds to 77-year-olds.")

Older people are particularly vulnerable to the other adverse effects of these drugs, including constipation (which, in turn, can cause urinary incontinence), blurred vision, dizziness, anxiety, depression and hallucinations.

Alternatives: As a first step, it's important to make sure that you have been properly diagnosed. Check with your doctor or other

pelvic muscles that help control urination.

If these approaches don't work out, consider trying adult diapers, pads or panty liners, which can be purchased just about anywhere. They can be worn comfortably (and invisibly) under everyday clothing and virtually eliminate the risk of embarrassing accidents. In my experience, many patients are reluctant to try this approach, but once over the initial hurdle, come to prefer it for security and peace of mind.

10 ANTIHISTAMINES (FIRST-GENERATION)

Why they are pre-

scribed: These medications are used to relieve or prevent allergy symptoms or those of the common cold. Some antihistamines are also used to prevent motion sickness, nausea, vomiting and dizziness, and to treat anxiety or insomnia.

Examples: Brompheniramine (Dimetane), carbinoxamine (Clistin), chlorpheniramine (Chlor-Trimeton), clemastine (Tavist), diphenhydramine (Benadryl) and hydroxyzine (Vistaril).

How they can cause

memory loss: These medications (prescription

and over-the-counter) inhibit the action of acetylcholine, a chemical messenger that mediates a wide range of functions in the body. In the brain, they inhibit activity in the memory and learning centers, which can lead to memory loss.

Alternatives: Newer-generation antihistamines such as loratadine (Claritin) and cetirizine (Zyrtec) are better tolerated by older patients and do not present the same risks to memory and cognition. 🌐



health professional to see if your urinary incontinence symptoms might stem from another condition (such as a bladder infection or another form of incontinence) or a medication (such as a blood pressure drug, diuretic or muscle relaxant).

Once these are ruled out, I'd recommend trying some simple lifestyle changes, such as cutting back on caffeinated and alcoholic beverages, drinking less before bedtime, and doing Kegel exercises to strengthen the

Stainless Pin | \$10



THE HOPE-KNOT PROJECT

DESIGNED TO REMIND US OF THE RELATIONSHIPS WITH THE WOMEN IN OUR LIVES.



THE HOPE-KNOT is an icon designed by the Women's Brain Health Initiative to create awareness and escalate concern over the unchecked growth of dementia and other aging brain diseases in women. A symbol of the importance of memory and a loose visual likeness of the brain, the Hope-Knot reminds us of how connected every aspect of our lives is to our ability for cognitive thought.

So the next time you see someone wearing a Hope-Knot, take a moment to think of the women in your life - your mother, daughter, sister, partner or best friend and remind yourself of how much you depend on their insights, memories, and that twinkle in their eyes. And the next time you see one for sale, remind yourself how much all of that is worth to you. And then when people see you wearing yours, pass the thought on to them. Support the Initiative. Wear a Hope-Knot.

WILL YOU FORGET? WE HOPE-KNOT.

SUPPORT THE INITIATIVE. WEAR A HOPE-KNOT.

An ideal gift for yourself or someone special, choose from a range of exclusively designed Hope-Knot products, including handbags, jewelry and t-shirts.

Women's Brain Health Initiative Hope-Knots* can be purchased online at the Hope-Knot Shop* hopeknot.myshopify.com or by calling 1-888-927-2011.

*charitable receipt for maximum allowable by law; minimum order is \$50 before tax and delivery
*to view the selection of Hope-Knot products refer to the drop-down box CHOOSE A BRAND on the left side under BROWSE.



Sterling Cufflinks
\$250



Sterling Pin
\$125



Sterling Pendant & Chain
\$170



T-Shirt
\$20



Leather Wrist Bag
\$120



Leather Messenger Bag
\$250

THE HOPE-KNOT DESIGN

Mark Lash, Women's Brain Health Initiative Hope-Knot Designer

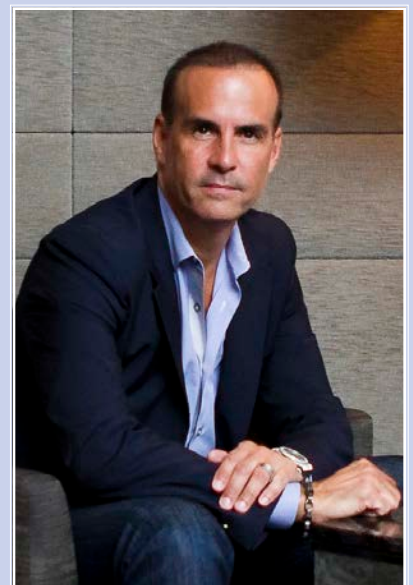
Combating women's brain disorders is a cause close to my heart. I have first-hand experience of the devastating impact on family and friends who have been afflicted and affected by Alzheimer's disease and other dementias. These high functioning, independent and loving individuals became a mere shadow of themselves.

My inspiration for the Hope-Knot design came from the complexity and interconnec-

tivity of the brain itself. I wanted to show the deterioration of the brain but I also wanted to keep the strength and beauty of the person intact.

The Hope-Knot is a contemporary interpretation of the human brain. The open space represents how disease destroys a healthy brain while the intertwining aspect of the design represents how messages become scrambled as the disease progresses.

The Hope-Knot can be worn by men and women to remind us all of the women in our lives and how much we depend on their memories and insights.



Many articles in this magazine make it clear that women's brains are different than men's brains. It turns out that even among women, there are differences depending on their life experiences, in particular, whether they have experienced pregnancy and motherhood, or not.



cause we are finding that drugs are working differently in a maternal aging brain compared to non-maternal brain." This points to the need for tailored treatment, not just for women versus men, but even among women with different life experiences.

Moms know intimately that pregnancy and motherhood can be draining, both physically and emotionally. Given the numerous changes taking place in a woman's body during pregnancy and after birth, the physical demands are obvious. One might not find it surprising to learn that there are cognitive effects from all of those demands, perhaps due to the drastic fluctuations in hormones that take place during that time period. You might be surprised to learn that long after children are grown, mothers may still experience impacts on their bodies, including brain function.

THE LINK BETWEEN MOTHERHOOD AND VARIOUS DISEASES

Studies have shown that there are links between motherhood and certain diseases. In the short term, mothers experience increased risk of postpartum depression and obsessive compulsive disorder (OCD). Motherhood may, in the long term, increase the risk of Alzheimer's disease, although this is very early research and the effect seems to be mitigated by breastfeeding and by how many girls versus boys that you have. On the positive side, motherhood has been linked with decreased risk of breast, ovarian and endometrial cancers.

MOTHERHOOD SLIGHTLY IMPROVES MEMORY

Researchers are taking a closer look at the impact of motherhood on the brain in

MOMS' BRAINS ARE DIFFERENT

particular. Research has shown that many months after they have had their last litter, middle aged rat mothers have almost three times as many new brain cells as female rats who have never had a litter. How does that impact memory? Liisa Galea, a neuroscience professor and researcher at University of British Columbia, tested the memories of middle-aged rats who have either had pups or not and discovered that the mother rats show slightly enhanced memories compared to the non-mothers. That was true for both reference memory, which is long-term, and working memory, which stores new information. "This was a fairly weak effect, but it was still there," explains Galea.

DRUG TREATMENTS WORK DIFFERENTLY IN MOMS VS NON-MOMS


Further research looked at differences between mom and non-mom rats with regard to the effectiveness of hormone replacement therapy (HRT). Galea and her colleagues looked at the effects of Premarin, a commonly used HRT containing a relatively weak estrogen, estrone. "Much to our surprise we discovered that non-moms got better but moms got worse in terms of memory performance after exposure to Premarin," shares Galea. "This is pretty profound be-

Research with humans also supports the findings that there are differences between the brains of mothers and non-mothers. Galea has begun working in partnership with Sherri Hayden who

is a neuropsychologist at the Alzheimer's Clinic at UBC Hospital to look at differences among women who have been diagnosed with dementia. Preliminary findings revealed that women with two or more children performed better on a cognitive test, the Mini-Mental State®, than women who had one child or no children. This points to women's brains being different based on reproductive experience. Galea summarizes, "For women who do have dementia, it looks like those with children are performing a little better." More research is required to examine the potential reasons for these differences. Galea speculates that there may be biological reasons behind the findings, but there could also be additional social supports at home for the women with children that potentially impact their cognitive health. 🌱



Liisa Galea, PhD
Professor, Distinguished University Scholar,
Department of Psychology,
University of British Columbia

A woman with dark hair, wearing a blue and white striped long-sleeved shirt, is shown from the side, looking upwards. She is holding a large, translucent orange net that is draped over her head and extends towards the top right of the frame. The background is a bright, sunny beach scene with waves breaking on the shore under a clear blue sky. The overall lighting is warm and bright, suggesting a sunny day.

Women's brains are different than men's, and that variation makes a difference. The disparity in our brains result from dissimilarity in our genes and hormones. Brains are shaped during development, just as genitalia are. Brains are also shaped by life, with culture and learning experiences changing our brains over time. One of the biggest differences between men's and women's brains is related to hormones. Hormones have been shown to affect the brain across the life span, affecting reproduction, emotion and cognition.

EFFECTS OF OVULATORY CYCLE

Women have unique brain connections that allow them to have an ovulatory cycle during their reproductive years. Some of the effects of the ovulatory cycle include:

- Drugs are more or less effective depending on where a woman is in her ovulatory cycle.
- Pain may be less intense during the follicular phase of the menstrual cycle, when estrogen levels are highest.
- Sleep may vary subtly for some women throughout the ovulatory cycle.

MENOPAUSE AND OVARY REMOVAL DECREASE ESTROGEN

A woman's hormones vary throughout her ovulatory cycle but also vary significantly across her life span, with the biggest change occurring midlife when her reproductive years come to an end. Menopause leads to a decrease in 17-beta estradiol, a form of estrogen produced by the ovaries. With this reduction in 17-beta estradiol, women may begin to experience memory changes which ultimately may predispose them to Alzheimer's disease. Given the potential for negative cognitive impacts after menopause, researchers were curious about what happens when the ovaries are removed surgically before menopause, thereby removing a woman's major source of estrogen at an early age. >>

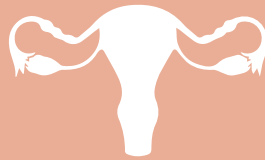
ESTROGEN BOOSTS BRAIN POWER

Gillian Einstein, a psychology professor and cognitive neuroscientist at the University of Toronto, and her colleagues have focused their research on women who have had their ovaries removed before natural menopause and do not go on hormone replacement therapy (HRT). By studying the women who do not have ovaries and are not having their estrogen replaced with a drug intervention, they are able to observe the impact of premature reductions in 17-beta estradiol. "Early results suggest that memory is negatively affected by estrogen deprivation," explains Einstein, "and the effects are almost immediate, and get worse over time. What this suggests is that estrogen is really important, especially for young women's brain health."

REMOVING OVARIES AFFECTS ENTIRE BODY

Einstein wants women to be aware of what can happen after ovary removal. While women will certainly decrease their risk of ovarian cancer, they may experience cognitive changes and negative impacts on their bone and heart health, as well as their immune system. "It is important to recognize that removing ovaries does not just affect the reproductive system but the entire body," she says.

"Unless a woman actually has ovarian cancer, it would be best if she could keep her ovaries," urges Einstein. Of course, there are some very good reasons for a woman to undergo the removal of her ovaries; it's not always possible to avoid removal of your ovaries. For those women who do end up having their ovaries removed, Einstein advises, "Estrogen replacement therapy may be extremely important but it's a complex topic. It may be contra-indicated, as in the case of women with breast cancer, but in some cases it appears to be an extremely beneficial treatment option. So it's critical for doctors to consider each woman's unique circumstances when deciding whether or not to prescribe HRT, which type of therapy to use, and the dosage. Estrogen is a very powerful molecule and more re-



Women who have one or both ovaries removed before menopause are more likely to develop Alzheimer's disease and other forms of dementia. The younger the women are when they have their ovaries removed, the more likely dementia is to develop.

search is needed to better understand how it can be used most effectively as a treatment."

WHY AREN'T WOMEN STUDIED MORE?

If there are these differences between men's and women's brains, and these differences have an impact on health and determining appropriate treatments, why aren't women being studied more? Einstein believes there are a number of possible explanations. There may be social reasons, i.e. it seems politically incorrect to differentiate between the sexes. There may be a reluctance to look for these differences because we don't know what to do with the results. Probably the most significant reason is economic. It is more complex and thus costs more money to consider sex differences in research studies; more participants are needed, more analysis is required, and the study design must take into account the variations caused by female participants' menstrual cycle.

Just because the research is more complex doesn't mean it should be avoided. "Justice demands that we study women's brains - we're half the population," says Einstein with determination. "It's good science. It will lead to better medicine and innovation. We'll learn new things about the brain that we didn't know before and that will have a positive impact on everyone, men and women." 🌐



*Gillian Einstein, PhD,
Director, Laboratory of Cognitive Neuroscience
& Women's Health Associate Professor, Dept. of
Psychology, University of Toronto*

NEW GUIDELINES FOR PREVENTING STROKE HIGHLIGHT RISK FOR WOMEN



RISKS FOR WOMEN

While many stroke risk factors are shared with men, there are some risk factors that are unique to women.

High blood pressure, migraine with aura, atrial fibrillation, diabetes, depression and emotional stress, tend to be stronger or more common in women than in men.

In addition, preeclampsia and eclampsia are blood pressure disorders during pregnancy that cause major complications, including stroke during or after delivery, as well as risk for stroke well after child-bearing.

Dr. Cheryl Bushnell, associate professor of neurology at Wake Forest University Baptist Medical Center, North Carolina and director of the Medical Center's stroke center and co-authors, include these stipulations:

Women who have preeclampsia have twice the risk of stroke and a fourfold risk of high blood pressure later in life. Therefore, preeclampsia should be recognized as a risk factor well after pregnancy, and other risk factors such as smoking, high cholesterol, and obesity in these women should be treated early.

Women should be screened for high blood pressure before taking birth control pills because the combination raises stroke risks.

Pregnant women with moderately high blood pressure (150-159 mmHg/100-109 mmHg) may be considered for blood pressure medication, whereas expectant mothers with severe high blood pressure (160/110 mmHg or above) should be treated.

Women who have migraine headaches with aura should stop smoking to avoid higher stroke risks.

Women with a history of high blood pressure before pregnancy should be considered for low-dose aspirin and/or calcium supplement therapy to lower preeclampsia risks.

Women over age 75 should be screened for atrial fibrillation risks due to its link to higher stroke risk.

STROKE 101

To work properly, the brain needs oxygen and though it makes up a mere two percent of total body weight, it uses 20 percent of the total oxygen inhaled. Arteries deliver oxygen-rich blood to the tissues of the body, but when the flow of oxygen to the brain is interrupted and brain cells begin to die, this is called a stroke – and sometimes referred to as a brain attack.

Symptoms, including difficulty talking, speaking, understanding, and seeing, as well as headache and paralysis, signal the advent of this medical emergency. Anyone experiencing such symptoms should get help immediately.

The new guidelines are intended for primary care providers, including OBGYNs, and outline not only risk factors unique to women but also provide, in some cases, recommendations for avoiding heightened danger.

For both men and women, the modifiable risk factors Dr. Bushnell previously documented include hypertension, exposure to cigarette smoke, diabetes, atrial fibrillation, dyslipidemia, carotid artery stenosis, sickle cell disease, postmenopausal hormone therapy, poor diet, physical inactivity, obesity, metabolic syndrome, excessive alcohol consumption, drug abuse, use of oral contraceptives, sleep-disordered breathing, inflammation, and infection. 🌐

Source: *The American Heart Association*

LIFE AFTER STROKE

RECONCILING THE NEW ME

As told by Jan Laschinger

I was just nine months into an exciting new chapter of my life when it all came crashing down.

Three years ago I was a 39-year-old newlywed, living and working as a nurse manager at a hospital in my new home of London, Ontario. I had moved there from Toronto to join my new husband, bringing with only my beloved Pomeranian dog, Ziggy, and my visions of the future.

My husband and I had met while both on vacation in Cuba, and the romance continued upon our return to Ontario. We had dated long distance for just five months before getting married. It was like something out of a movie or a fairytale.

I was still getting to know the city and most of my time was spent at work. My job was intense, but I loved every minute of it. I was always a “go-go-go” kind of person, so my high demand nursing role suited me well.

I had previously worked as an emergency department nurse in Toronto, and before that, I had a career in social work. I’d always been a people person, with boundless energy and a desire to help others. If I wasn’t at the hospital, I was at the gym, or walking Ziggy, or just getting into the groove of married life - I was just always going.

I remember coming home at the end of the day with a terrible headache. I’d had migraines before, so I dismissed it, but when my husband saw me he asked what was wrong.

I said it was just a headache but he looked alarmed and said something wasn’t right. He couldn’t explain it, but said there was something about my appearance that didn’t look typical of a headache and he insisted on getting me to the hospital immediately.

So we headed to my place of work, only this time I was going there as a patient to the

Emergency department.

After some tests, they discovered I had a cerebral hemorrhage. I was immediately sent to surgery for an operation to relieve the pressure on my brain; they removed a piece of my cranium and put in a shunt to drain the blood. However, while I was in the hospital, I developed complications and an infection set in. There was more brain damage and more surgery.

And then darkness.

The rest as I know it comes from what the doctors later explained to me because I don’t remember any of it. I’d suffered a Cerebral Vascular Accident (CVA) - another word for stroke.

Three months would pass before I would wake from the medically induced coma I’d been put in to protect my brain while it healed.

One of my only memories, shortly after waking, was my husband standing at the end of my hospital bed. Coming into consciousness, I could hear him telling me that he couldn't do this anymore and that he was done.

Then he left.

Lying there, I wasn't able to respond to him, as I had lost my ability for speech. I didn't even fully recall him as my husband at the time. I imagine if I'd remembered him and our life together I'd have been heartbroken.

Maybe not remembering much has worked to my advantage and insulated me from feeling more hurt or angry than I do. It's funny how much I don't remember, but I remember that. I haven't seen him since.

The months that followed were a blur that only began to clear after I was sent to a neuro-rehabilitation program in London. They did amazing work with me and I'll forever be thankful for the care I received. As I began to recover my ability to walk and speak, my memory of life prior to the stroke started to come into focus as well.

I spent more than half a year working to regain my gross motor skills and during most of that time I was just in a state of shock and confusion. I kept try-

ing to understand what was going on. In my mind I felt "normal" and like "me" - so I couldn't fully understand why I was there.

I remember wanting to just get up to do things as I always had, but my intention and the corresponding action would not match up. I was so frustrated. When I could walk again I just did a lot of pacing. I had never been a patient person. I always wanted things done yesterday and my recovery demanded a whole level of patience I had nev-

er cultivated. Finding patience within myself was the hardest thing I'd ever done.

Throughout the year spent in hospital and rehab, my parents and my older brother came to visit regularly. I was a bit of a helion in my youth and that had defined our relationships. I was always very independent and always left to do my own thing.

The stroke changed that.

It created a reality in which someone else needed to make the decisions for me and the same mother who had always let me do what I wanted was granted my power of attorney.

With that role, she became more overbearing and protective than she had been, even when I was a child. As I came further along in my recovery I grew to resent the way she made me feel like an incapable child.

Even now, if I'm coming for an overnight vis-

it, my hope is to regain my independence and create a life for myself where I have a job, a home, and can live with Ziggy again. I miss him terribly.

For now, I'm back in Toronto, living in a nursing home in a young person's unit and supported by the Ontario Disability Support Program. I look normal. If you saw me walking on the street you'd never think I had a brain injury. I still get hit on. It feels nice.

No one looks at me and thinks "stroke survivor."

Sometimes that's great because strangers will interact with me normally. But it's also a bit harder because they don't realize I have a disability. I'll find myself explaining I need to sit down because I tire quickly. I have memory loss issues. I need them to go slower. My outward appearance and my inner reality don't quite match up. And as someone who never stepped back, I hate having to tell people that there's something

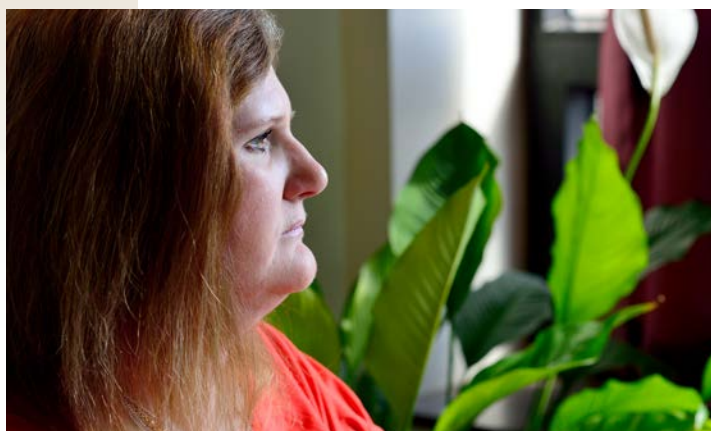
I can't do. That's still hard to accept.

I know I don't have the same life I had before. Sometimes I'm just bored by the life I have now. I try to make it active. I take drama and cooking classes and like to go for walks and I'm working on finding a job that I can do. I know I'd never have the stamina for the

career I had before, but I'm still a people person.

And sometimes when I'm fully in a moment, like spending time with Ziggy or engrossed in my favourite TV show, I can completely forget this isn't my old life. But then, that moment passes and I'm reminded of my circumstances.

That's when I draw on my newfound patience and tell myself to give it time. 🌱



it, she'll email me a list of what to pack and that just makes me angry. My dad however, has managed to treat me the same as he did before the stroke and it means a lot to me. It helps me to identify with the person I was just a few years ago - just a more patient, calmer version.

My good friend, Jennifer, has been an amazing support and she has been caring for Ziggy for the last three years. Once a month, I make the bus trip to Huntsville to

HOW BLUE ARE YOU?

It's been over two weeks since you've felt like yourself - loss of appetite, erratic sleep patterns, unable to concentrate and even the things you like to do, aren't giving you any enjoyment. You can't put your finger on it, but you hear yourself using words like glum, miserable, unhappy - basically down. What's going on and what should you be doing about it?

The Women's Brain Health Initiative recently sat down with Dr. Nasreen Khatri, a registered clinical psychologist who specializes in the assessment, treatment and research of mood and anxiety disorders to discuss issues of depression and the aging brain.

"Depression is a combination of many symptoms," said Dr. Khatri. "Changes in physical health, cognition and mood all point to something going on. Depression in a 30 year-old woman can present itself as being upset, sad and crying with no real understanding of where this is coming from. In a 70 year-old woman, it can present itself as memory complaints."

What should we be looking for if we are concerned that 'something' is going on?

See your doctor. Get a physical. Make sure that there are no physical changes caused by low iron or change in thyroid function,

issues that have symptoms that can mimic depression. Ensure that you have your hormone levels checked as well to rule out hormonal fluctuations caused by pre-, peri- or post-menopause.

If your doctor doesn't find anything physical, you should then have a mood assessment - what Dr. Khatri calls "A Check Up from the Neck Up."

A mood assessment will detect your depression, help identify lifestyle and environmental factors contributing to your illness, and provide a rational basis for the development of a treatment plan.

What options do you have if you are diagnosed with depression?

There are various antidepressant drugs on the market that your physician can prescribe. However, for older adults, medications can take longer to produce a therapeutic affect; most elderly have complex medical conditions, which may contradict the use of antidepressant drugs; and side effect profiles may be intolerable for some elderly individuals.

On the other hand, Cognitive Behaviour Therapy (CBT) is a psychotherapeutic approach addressing emotions, behaviors and cognitive processes. It is a structured, evidence-based time-limited psychotherapy that is the gold standard treatment for treating depression. It is especially helpful with older adults because their depression involves cognitive dysfunction that CBT can address. Also there are no drug interactions, side effect profiles or wait times for therapeutic effects to 'kick in' as there may be with drug treatments.

"Because CBT is a more targeted treatment," says Khatri. "it is the gift that keeps on giving. CBT is a self-management program that allows the individual to become her own therapist over time. Studies have shown that patients with depression who are treated with drugs are twice as likely to relapse within 12 months of stopping treatment as patients who engage in Cognitive Behaviour Therapy. CBT is cost-effective; improves mood, cognitive functioning and problem-solving skills; and, cuts relapse rates. And because it helps improve cognition, it may help stave off dementia."

Which relates to the very first thing that Dr. Khatri told me - a history of untreated depression in mid-life and beyond doubles the chances of developing dementia later in life. What else can we do to counteract the impact of depression on our cognition?

How many studies does it take to convince you that moderate exercise will make you happier? If you need one more reason to

start being more physically active, professors from the University of Toronto have compiled and analyzed over 26 years' worth of scientific research which concludes that even moderate levels of physical activity—like walking for 20-30 minutes a day—can ward off depression in people of all ages.

Make sure to talk to your doctor about the best exercises for you - those that will have the greatest impact on your brain. Neuroscientists now know that we can grow new cells in the hippocampus - the part of the brain that regulates memory. What's good for your heart is good for your brain, which means that cardio exercises, the one that makes you sweat, will help you to retain memory and can be another preventive measure for declining cognition.

Another interesting factoid is that we all tend to hold onto negative memories - so it's important not only what you remember, but how you remember it. One of the benefits of exercise is that it makes us feel good about ourselves, improves outlook as well as general health - all a good thing.

Dr. Khatri wants us to remember that depression is one of the most burdensome disorders worldwide. The impact of this crisis will be felt at every level of society and within every age group. Because women fulfill the role of wife, mother and caregiver, we can't afford to breakdown. Although we have no current cure for dementia, we can help prevent cognitive decline as we age.

"You can always change your mind," says Dr. Khatri. 🧠

Nasreen Khatri, PhD, CPsych, clinical psychologist and researcher at the Rotman Research Institute at Baycrest in Toronto.

- 1 A history of untreated depression in mid-life and beyond doubles the chances of developing dementia later in life.
- 2 Women are diagnosed twice as often with depression compared to men.
- 3 Women are twice as likely to have dementia than men.
- 4 Depression is usually a chronic disorder more like diabetes, than an acute episodic problem, such as breaking your leg.
- 5 Depression starts in the mid-twenties for women and tends to wax and wane throughout life.
- 6 Depression exacerbates chronic physical health disorders, such as hypertension and diabetes.
- 7 As a population ages (as is the case in Canada), the number of depressed people increases.
- 8 The highest suicide completion rate occurs in adults over 65.

DR. KHATRI BEGAN OUR INTERVIEW BY GETTING US UP TO SPEED ON SOME OF THE FACTS WE ALL NEED TO KNOW ABOUT DEPRESSION, WOMEN AND AGING.





PUMP UP YOUR HEART TO PUMP UP YOUR BRAIN

EXERCISE FOR A HEALTHY BODY AND BRAIN

A STRONG RELATIONSHIP EXISTS BETWEEN PHYSICAL ACTIVITY AND COGNITIVE PERFORMANCE

A 2010 report released by the Alzheimer Society of Canada, *Rising Tide: The Impact of Dementia on Canadian Society*, warns of a coming dementia epidemic. At the time the report came out, approximately 500,000 Canadians had dementia, and that number is expected to rise to over 1.1 million within a generation (by 2038) - that will be 2.8 per cent of the Canadian population! The cost in 2010 of dementia care was \$15 billion, and that cost is expected to balloon to \$153 billion by 2038. And what about the caregivers? How much time do Canadians spend providing informal care for loved ones with Alzheimer's disease or a related dementia? In 2010, Canadians were already spending 231 million hours providing informal care

and by 2038 that is predicted to grow to 756 million hours. The cumulative economic burden is expected to reach \$872 billion by 2038, while the demand for long-term care will increase tenfold.

At this point in time, "there is no silver bullet, no pharmacological intervention that has been proven successful at reversing or preventing Alzheimer's disease," explains Marc Poulin, member of the Hotchkiss Brain Institute and Brenda Strafford Foundation Chair in Alzheimer Research within the Faculty of Medicine at the University of Calgary. Lifestyle choices, however, are known to impact the risk of getting Alzheimer's disease and the rate of the disease's progression. A study published by *Lancet Neurology* in 2011 calculated the number of cases of Alzheimer's disease that could be attributed to potentially modifiable risk factors including diabetes, midlife hypertension, midlife obesity, depression, physical inactivity, smoking and low education.

Physical inactivity had the second highest level of relative risk, after depression. Poulin focuses on researching the impact of increasing physical activity levels on brain function.

COGNITION CLEARLY BOOSTED BY EXERCISE

A strong relationship exists between physical activity and cognitive performance; that has been well established through more than 30 years of research. While research has clearly shown that physical activity has a favourable effect on cognition in older populations, what remains unclear is what the underlying mechanisms are for that positive effect. Are the improvements in cognition caused by changes in blood flow to the brain? Poulin believes so. He has led studies examining whether greater amounts of blood circulating to the brain helps explain the boost in cognitive performance observed with aerobic exercise.

One study set out to test the hypothesis that post-menopausal women who exercise will have better cognitive outcomes than post-menopausal women who are sedentary. Forty-two women in Calgary, aged 50 to 90 years, were recruited - half of which were considered sedentary and half of which were considered active



and fit, based on their self-reported activity levels and a stress test to measure their fitness. After administering a comprehensive set of cognitive function tests, an overall average cognition value (or score) was calculated for each participant. The average cognition value for the active and fit group as a whole was 10 percent higher than for the sedentary group, indicating that the active group seemed to have better cognitive function overall.

Participants also underwent numerous other tests related to their cardiorespiratory function and cerebral blood flow, and the results showed that with exercise you bring about great benefits to the blood vessels in your brain, which helps increase cognitive performance. Poulin believes that improved cerebral blood flow helps bring nutrients to the brain and remove waste products of metabolism from the brain, both important for brain health.

INTERVENTION EXPLORES IMPACT OF EXERCISE ON BLOOD FLOW IN BRAIN

To expand on what was learned in that initial study of older women, Poulin is now leading another study, Brain in Motion, that is examining the impact of introducing structured aerobic exercise to a group of sedentary men and women over the age of 55. The 250 dedicated participants will do

aerobic activity for 30 minutes per day, four days each week, for a six-month period, while tracking their progress using a wide range of tests, to assess what is happening to their bodies and brains as a result of this physical activity intervention. The first batch of participants started in 2010 and the last batch will finish this year. Once each group has finished their six-month session of structured training, they will return for additional testing six months later to determine the extent to which changes persist over time. Initial results suggest that participants are significantly increasing their aerobic fitness levels and experiencing improvements on cognition tests. Tests also show that the volume of blood flowing to their brains is increasing modestly. Anecdotal findings are strong, as well, with many participants reporting that they are noticing improvements in their cognition, sleep and energy levels. Complete study results will be available in 2015 and will include an analysis of sex differences.

Introducing regular aerobic exercise has proven to be a powerful intervention, one that is inexpensive and easily accessible to most people. It is widely understood that exercise offers powerful benefits for the heart and body, and now Poulin's research has helped contribute to our understanding of its impact on brain

health as well. Future research is likely to strengthen the already strong case in favour of getting active.

START EXERCISING TODAY

The onset of Alzheimer's disease is a gradual process, with a lag occurring between the time initial biomarkers of the disease show up in the body and the time clinical symptoms are noticeable. That lag phase varies in length from person to person, typically lasting between 10 and 20 years before the disease becomes evident. That leaves a big window of opportunity to try and intervene, making lifestyle changes that can possibly prevent or slow down the progression of cognitive decline. As Poulin points out, "It's never too late to start making healthier lifestyle choices. Today's a great day to begin." 🌍



Marc J. Poulin, PhD, DPhil
Professor, member of the Hotchkiss Brain Institute, and Brenda Strafford Foundation Chair in Alzheimer Research, University of Calgary.

¹ If you have any health concerns, it is recommended that you see your doctor before starting an exercise program.



THE BODY AND BRAIN CONNECTION

Most of us know that physical exercise is good for our general health, but did you know that physical exercise is also good for your brain? If you think you're going to get smarter sitting in front of your computer or watching television, think again.

Physical exercise has a protective effect on the brain and its mental processes, and may even help prevent Alzheimer's disease. Based on exercise and health data from nearly 5,000 men and women over 65 years of age, those who exercised were less likely to lose their mental abilities or develop dementia, including Alzheimer's.

Furthermore, the five-year study at the Laval University in Sainte-Foy, Quebec suggests that the more a person exercises the greater the protective benefits for the

brain, particularly in women.

Inactive individuals were twice as likely to develop Alzheimer's, compared to those with the highest levels of activity (exercised vigorously at least three times a week). But even light or moderate exercisers cut their risk significantly for Alzheimer's and mental decline.

WALKING IMPROVED MEMORY-STUDY

Studies of senior citizens who walk regularly showed significant improvement in memory skills compared to sedentary elderly people. Walking also improved their learning ability, concentration, and abstract reasoning. Stroke risk was cut by 57% in people who walked as little as 20 minutes a day.

WAKE UP YOUR BRAIN

In the morning, while you're still in bed, slowly begin to move your toes - any way that feels good. Wiggle, scrunch, and stretch. Move all your toes up and down several times, or work just your big toes. Wiggling your toes activates nerves that stimulate your brain and internal organs.

Do this exercise first thing each morning or after sitting for an extended period of time. It will help you to wake-up and become alert more quickly. Your whole body may feel pleasantly energized. Most important, your first steps - and those throughout the day - will be safer ones. (Falls are the second leading cause of spinal cord and brain injury among people over 65 years old.)



RESISTANCE IS NOT FUTILE

Resistance strength training is the process of building muscle by imposing demands on the body. As a person overloads her muscles, she can achieve increased muscular endurance, lose weight, and even control diseases such as high blood pressure and diabetes.

Although many people believe that resistance strength training, or weight training, must be done in a gym, this is a complete misconception. It is completely acceptable to perform resistance strength training exercises in the home, or any other open, safe area. 🧘

Source: Samantha Kopf
National Academy of Sports Medicine
Certified Personal Trainer

THE WORKOUT

*The best exercises to perform in the home are those that require little to no equipment. With the exception of crunches, all exercises should be performed for **3 sets of 15 reps.***

1. DIPS

Dips target the chest and triceps and only require the use of a small table or platform (around 18 inches high). To perform a dip, an exerciser should place her hands on the edge of a table with the fingers facing forward. Feet can be placed flat against the floor with knees bent (easiest), on the heels with straight legs (medium), or can be alternated (hardest). The lower body should be kept as close to the floor as possible, while keeping the back close to the table. Push off of hands until arms are straightened.

2. SQUATS

A squat is an exercise that targets the lower body. It strengthens the quadriceps (front of the upper legs), the hamstrings (back of the upper legs) and the glutes. A squat movement mimics sitting in a chair and standing back up. To correctly perform a squat, a person should stand with her feet hip width apart. The second and third toes should be pointed straight ahead. The arms can either be held out in front of the body, straight above the head or with the hands clasped behind the head.

Once in position, the exerciser should lower her glutes to the floor while keeping her feet flat on the ground and head facing forward. The glutes should never lower past the knees. To increase the resistance, one should hold free weights in straightened arms.

3. PUSH-UPS

A push-up works the chest and triceps. Push-ups are great for at home workouts because they require no equipment. To start easy, an exerciser should kneel on a soft surface with her toes on the ground, then place her hands a comfortable width apart with fingers facing forward. Placing hands too wide or too narrow will increase the difficulty of the exercise.

With abs drawn in and the glutes engaged, the exerciser should lower her chest down to the floor. The exerciser should stop when her chest is around six inches from the ground and then push herself back up until arms are straightened.

To make push-ups harder, the exerciser should move from her knees to her toes. Repeat 3 sets of 15 reps of this exercise. The head should be kept in a neutral position without tucking or extending the chin.

4. CRUNCHES

Crunches target the abdominal muscles. There are a wide variety of crunches that can be performed with no equipment. To perform a basic crunch, an exerciser should lay on her back on a soft surface with his feet flat against the floor and knees bent. Arms can be placed across the chest (easiest), straight above the body (medium) or with hands clasped behind the head (hardest). The head should remain in a neutral position and should not return to the floor until the exercise is totally complete.

An exerciser should lift, from the abs, until the head, shoulders, and upper and middle back come off of the floor. To complete one crunch, the exerciser should reverse the movement touching first the middle and upper back and then the shoulders to the floor. The lower back should remain pressed into the floor throughout the entire exercise. Perform 25 crunches in a row.

TIP THE FRAILTY SCALE IN YOUR FAVOUR

DECREASE DEFICITS TO DECREASE DEMENTIA RISK

There are no physical tests to diagnose dementia with certainty, rather, doctors assess the symptoms (what patients complain about) and signs (what the doctor can see) to determine whether someone is experiencing dementia. Alzheimer's disease is the most common cause of dementia but there are other causes as well; another one is vascular cognitive impairment, which can result from changes in blood flow to the brain or mini strokes that build up over time. Often there are combined causes for dementia.

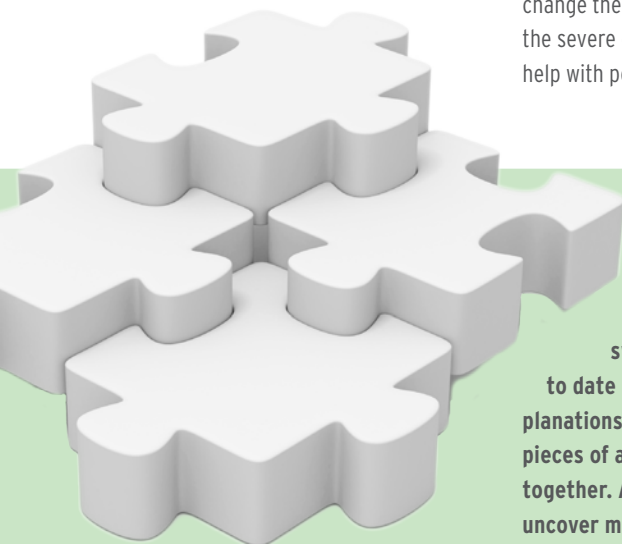
STAGES OF DEMENTIA Dementia is a progressive illness. It starts in a mild stage, progresses to moderate and then proceeds to a severe stage. "All people with dementia will have functional impairment of some degree," describes Melissa Andrew, a professor and researcher in geriatric medicine at Dalhousie University. With mild dementia, people will begin having trouble with "Instrumental Activities of Daily Living" such as driving, handling their finances, using the phone, cooking, cleaning and shopping. When the dementia proceeds to a moderate



stage, people are able to do only basic activities of daily living and require prompting to do so, e.g., need to be reminded to change their clothes. When people reach the severe dementia stage, they require help with personal activities of daily living

such as dressing, bathing and using the toilet.

FRAILITY: A GERIATRIC ASSESSMENT TOOL
"In the bigger picture, the brain is very important, but it is only one part of the body,"



SEX DIFFERENCES IN DEMENTIA

Dementia is more common in women than men. Why? "That question is really complex to try and answer," says Andrew. Research to date points to some potential explanations, which Andrew describes as pieces of a puzzle we're still putting together. Additional research will help uncover more pieces of the puzzle over time.

BIOLOGY
Estrogen - Senior men have higher levels of estrogen than post-menopausal women. Estrogen is known to help protect cognitive function.

Frailty - Older women have higher burden of chronic illnesses than older men, and experience more functional problems and symptoms.

DEMOGRAPHICS
Life Expectancy - Women live longer than

Andrew points out. "It's all connected." A concept used in geriatric research and medicine that attempts to measure a person's overall health is frailty. It reflects someone's vulnerability to losing their independence in the future, based on the relative overall scope of their 'problems' versus their 'reserve.' Think of it like a balance scale measuring the things people have going for them (such as good health practices and support resources) versus what they have going against them (such as illnesses, disabilities or isolation).

"Some older people are in a very robust balance between those two sides," shares Andrew, "while other people are teetering quite precariously in this balance."

Different researchers measure frailty in different ways. Some focus exclusively on physical aspects. Andrew uses a holistic view that considers other factors beyond the physical. In both approaches, frailty is calculated by adding up the 'problems,' also referred to as deficits (with each receiving a single point) and dividing that number by the total number of potential problems in the list. For example, if someone is experiencing 10 out of a list of 40 problems, then their frailty index score is 0.25. This kind of scale to measure frailty has been used for more than 10 years and it has been used by different researchers in many different countries.


men. (Although, even when data is adjusted for age, many studies show that more women experience dementia.)


NEUROPSYCHOLOGY

Cognitive Test Profiles - Women tend to perform better on certain types of memory tests, especially verbal ones. It has been hypothesized that maybe women have "farther to fall" (i.e., they started out with high memory function) and so when they start experiencing reduced cognitive functioning, it is more obvious to others.

FRAILTY IMPACTS RISK OF FURTHER NEGATIVE OUTCOMES What have researchers discovered about frailty? Many studies from around the world consistently show that the more frail you are, the more likely you are to experience further bad outcomes including going into a nursing home, developing dementia or dying. Dalhousie University research looking specifically at dementia has shown that frailty might be the biggest risk factor of all for developing dementia, particularly for women because they tend to be more frail than men.

STEPS TO HEALTHY AGING The evidence points to good reasons for doing whatever you can to reduce your frailty. Thankfully, there are many things within your control that you can do to minimize your health deficits, thereby reducing your frailty. Andrew suggests the following Steps to Healthy Aging:

 **Physical activity** is probably the most important thing. Research has shown that exercise increases the size of the hippocampus and improves memory. Start off with 30 minutes a day at least three times per week and build from there. Even for seniors that aren't able to stand up, there are exercises that can be done seated in a chair.

 There are lots of studies that show being **socially engaged** is really good for your health. For example, one study from Finland discovered that singing in a choir is

beneficial. Many other leisure pursuits involving group activities have been shown to keep people's minds and bodies healthier.



Engage in mentally stimulating activities you enjoy to keep your

mind engaged and challenged. This doesn't need to be formal or expensive. Some examples include reading the newspaper, doing crossword puzzles or Sodoku, and playing chess or cards.

The steps to reducing your frailty, as described in the list above, can clearly infuse more fun in your life while at the same time reducing your risk of dementia. Avoiding dementia will help you remain independent longer, and independence is often the most valued qualities in later life. Cognitive decline happens gradually, starting quite early in life, so it's never too early to start living a brain-healthy lifestyle. And by taking good care of your brain, the rest of your body benefits, too. 🌍



Melissa Andrew, PhD, MD, MSc (PH), FRCPC-Geriatrician, Assistant Professor of Geriatric Medicine, Dalhousie University

SOCIAL ROLES & OPPORTUNITIES

Education - Higher levels of education are known to be protective against dementia. Among the current generation of seniors, there may be differences in educational level, with men typically having more education than women.

Functional Roles in Retirement - Women tend to participate in different roles after retirement than men. If the woman in a household is doing most of the cooking and cleaning, it may be more obvious when she

experiences a cognitive decline. Whereas, if a man is not doing those household activities, declines in his cognitive function won't be as noticeable.

Physical Activity - Physical activity is known to help protect against dementia. There may have been different lifetime levels of engagement in physical activity between men and women that are contributing to differing rates of dementia.



BRAIN MATTER MATTERS

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This month [November, 2013], I had the honour of being a part of the Halifax launch of the Women's Brain Health Initiative, a national charitable project to raise funds for research in Alzheimer's and other dementias. These diseases afflict women 70 per cent more often than men. In our small area of Kings West alone, Alzheimer's - or another form of dementia - will affect approximately 348 women this year.

Important and ongoing work to investigate these diseases has always emphasised men, albeit the marked discrepancy in the female to male ratio of those who suffer from dementias. Even the lab mice used in this research are male, because the differences in hormonal characteristics have proven to be very complex. The Women's Brain Health Initiative will fund research focused on women.

Some diseases are more common in childhood or among a certain demographic. It is important to understand that Alzheimer's, the most common form of dementia, is a disease that occurs primarily during mature adulthood and particularly among mature women. This disease is more prevalent in senior years, yet it is not a natural disease of aging. Age is merely a risk factor in developing Alzheimer's; it is not the cause. We still do not know the cause or causes of this

fatal disease, but inroads in neurological research look promising. Abnormalities in the brain of someone with Alzheimer's have been identified (inflammation, oxidative stress, mitochondrial impairment, glial cell sickness, calcium dysfunction and selective shrinkage—primarily in the memory and thinking areas), yet there is still no single known cause or cure.

Some studies suggest that Alzheimer's disease and other dementias will soon become one of the most prevalent expenses in healthcare. I applaud the Women's Brain Health Initiative for their dedication to promote research in this area. The direction of the strategy will depend greatly on the scientific research. For all the women in my life, I am committed to supporting any initiative that will help find a cure or at least improve the quality of life of those suffering from this disease.

As I delivered remarks at the launch of this initiative, I was reminded of a teaching colleague who, in her fifties, began to exhibit the classic sign of Alzheimer's. She would lose focus when preparing individual lesson plans for her students and, as her condition progressed, she would have to ask fellow teachers to remind her of the precise learning difficulties of the student she was assessing. Within a year, she had to leave the profession she loved and just five years later, she could not even recognise family members.

Until there is a cure for Alzheimer's, there are steps we can take to decrease the risk factors known to diminish brain function. Aging is a risk factor and, to my knowledge, we have not yet discovered a way to halt this natural process. However, we do know that healthy lifestyle choices help mitigate the negative effects of this progression. Exercise, exercise, exercise! People who ex-

ercise are 40 per cent less likely to develop Alzheimer's. Physical activity is imperative for the maintenance of the entire body and it is important to recognize that the brain is an organ of the body that needs to be cared for just as much as every other organ. Exercise helps the connectivity between nerve cells, so we need to do everything possible to increase our activity level.

During the launch of the Women's Brain Health Initiative, we were served chocolate!



The flavonoids in chocolate help improve blood flow, regulate cholesterol and lower blood pressure, so moderate levels of chocolate are good for the brain.

Berries and caffeine are rich in antioxidants, which help maintain brain health. The monounsaturated fats in avocados improve blood flow and the vitamin E in almonds lowers the risk of stroke, another risk factor for Alzheimer's. These fun facts do not replace the importance of making healthy eating choices at every meal. Diabetes and obesity are also risk factors, so it is important to work with our healthcare professionals to treat and manage all chronic conditions.

We can increase our health and help decrease our risk of developing Alzheimer's disease and other dementias. The choice is ours. Choose a healthy lifestyle!

Chocolate anyone? The women in my life are worth it! 🍫

Honourable Leo A. Glavine, Nova Scotia Minister of Health & Wellness



CAN I SHARPEN THE TIP OF MY TONGUE?

For many people the first sign of aging is a “senior moment”—forgetting names or appointments, misplacing car keys, not knowing why they entered a room. Less than a generation ago, conventional wisdom advised people to “grow old gracefully,” to accept that their bodies and minds would deteriorate at a predictable rate and in a predictable way. Subsequent studies have proven that regular exercise and proper nutrition can slow down and sometimes even reverse some of the aging process. Additional studies by the National Institute on Aging (NIA), part of the National Institute of Health (NIH), have demonstrated that adult brains may be just as resilient and adaptable as the rest of their bodies, given the necessary resources and proper training.

THESE STRATEGIES ARE DESIGNED TO HELP HONE YOUR MEMORY SKILLS:

1 Keep your mind active. Engage in activities that make you think and learn new things, such as playing games (e.g., puzzles, cards, chess), socializing, attending cultural events, and reading books.

2 Keep your body healthy. Eat a well-balanced diet that includes lots of fruits and vegetables. **Exercise regularly**, doing something you enjoy. Get your sleep. Try not to smoke or drink too much alcohol. Attend regular medical check-ups.

3 Manage stress. Participate in activities you find relaxing, such as going for a stroll, listening to music, or reading a book. Learn relaxation techniques such as deep breathing, meditation, and yoga. Take some time for yourself everyday.

4 Write things down. Use a pocket day planner or electronic organizer (PDA) to keep track of your schedule, frequently called phone numbers, “to do” lists, current medications or other important information. Writing things down does not make your memory lazy - it’s an active memory strategy.

5 Repeat information to yourself. If you want to memorize something, repeat it to yourself several times and gradually spread out the repetitions over longer and longer intervals.

6 Pay attention. It is hard to remember something you did not pay full attention to in the first place. Make a point of focusing your attention on information you want to remember, such as the name of someone you meet for the first time or where you parked your car.

7 Talk to yourself. Have you ever walked into a room and forgotten what you went there for? Have you ever left the house and wondered

whether or not you locked the door? State out loud (or to yourself) the task you intend to do or are currently doing. This will help you remember it.

8 Make things meaningful. If you want to remember a name, think about what the name means or associate it with someone or something that reminds you of the name.

9 Routine is the key. Memory strategies work best when they are used consistently. Use your day planner every day. Keep items that can be easily misplaced in a sensible location and get into the habit of always returning the items to those places.

10 Maintain a positive outlook. There are things you can do to improve your memory, and you have control over these things. People with positive attitudes toward their memory find it easier to learn and remember. Consult your doctor if you are feeling depressed and unable to achieve a positive attitude.



TRAIN YOUR BRAIN TO BOOST COGNITIVE RESERVE:

IT'S NEVER TOO LATE

There has been a dramatic increase in life expectancy in the past 100 years. In 2000, people on average lived 30 years longer than in 1900. With that increase in life expectancy comes an increase in age-related diseases. Sylvie Belleville, a psychology professor and researcher at Université de Montréal and director of the Montreal Geriatric Institute, points out, “The diseases we have in the last years of life are largely diseases of the brain.”

Alzheimer’s disease is the greatest fear associated with aging for most people. That fear is grounded in the reality that lots of people do get the disease. Statistics tell us Alzheimer’s affects eight percent of people aged 65+, and that percentage rises to 33

percent by the time people reach 80 years of age and above.

OLDER CANADIANS’ TOP HEALTH PRIORITY - MEMORY

A study by Dr. Cara Tannenbaum (Université de Montréal) and colleagues in 2005 asked over 1500 older Canadians, “What is your top health priority and on what issue should researchers focus?” The top health priority indicated by a significant majority of respondents was memory. Belleville does not find that response surprising, explaining, “There’s a kind of wisdom that comes with aging, that somehow we have come to accept the fact that we are going to die. But I think that older people just don’t accept

the possibility of losing their autonomy and dignity as they age. **When they lose their memory, they lose their identity. That’s why memory is such an important topic for older Canadians.”**

ALZHEIMER’S ONLY 100% CERTAIN AFTER DEATH

Alzheimer’s is a unique disease in that it is defined pathologically. Belleville explains, “That means that as long as you’re alive and doctors don’t have access to your brain, to look at it under a microscope, they are not able to diagnose it with any certainty.” A definitive diagnosis of Alzheimer’s disease cannot be made until after death, based on finding particular neural pathologies in the

brain. When someone is alive, doctors do what is called a clinical diagnosis, meaning that the person meets a number of criteria that are assessed when that person comes to the doctor such as memory and a review of any problems that are impacting their daily lives. If, after reviewing those “inclusion criteria” the doctor thinks the patient is experiencing memory problems, the doctor will then consider other factors that might be responsible such as depression, a brain tumor or vitamin B12 deficiency. It is only after other possible causes are ruled out that a clinical diagnosis of Alzheimer’s would be made.

Although samples of brain tissue to examine under a microscope for signs of Alzheimer’s are impossible to obtain while someone is alive, it is possible to conduct brain scans while someone is still living that show certain things about the brain. (See the article called “Sex Differences Evident in Brain Imaging” for more about the capabilities of modern brain scans on pg. 11.) In the early stages of Alzheimer’s you don’t see any changes in the brain but by the time the diagnosis is made, you can see significant effects, e.g. shrinkage of the brain overall and of the hippocampus, in particular.

WHAT KEEPS BETTY WHITE SO SHARP?

Everyone experiences cognitive decline as they age but some individuals are particularly resistant to the effects of brain aging and to Alzheimer’s disease. These people remain mentally sharp and vibrant well into old age - think of people like Betty White, Queen Elizabeth II, Mother Teresa and Jacques Cousteau. In some cases, there can be two different people with the same pathological lesions in their brains but one shows signs of dementia in their behaviour and the other appears normal. What can account for these differences? What do the people who have resistance to the effects of brain aging have in common? These people all seem to be extremely productive scientifically, artistically, or politically (which includes being engaged in their communi-

ty in any way, not just as a politician). Researchers believe that by continuing to use their brains intensively, those people might have high cognitive reserve (also referred to as brain reserve). People with high cognitive reserve have more neurons and a richer or more effective brain network that helps protect them from the impacts of brain aging and Alzheimer’s disease. Generally, people with high cognitive reserve are more educated, have intellectually stimulating hobbies, have intellectually stimulating careers, have rich social lives and are physically active. You’ll notice that most of these factors are modifiable; that is, they are things that you can do something to change even as you enter old age.

Research indicates that as many as **half of the cases of Alzheimer’s disease are caused by modifiable factors such as vascular risk factors, depression, physical inactivity, smoking and cognitive inactivity.**

Cognitive inactivity accounts for 19.1 percent of modifiable cases. There are things you can do to be cognitively active and increase your brain reserve, helping provide protection against cognitive decline.

YOU CAN CHANGE YOUR BRAIN

To see if cognitive performance could be improved with brain training, Belleville’s team in Montreal developed and tested a cognitive stimulation program for people with mild cognitive impairment, who were considered at risk for developing Alzheimer’s disease. The program, called MÉMO, brought in small groups of four to eight people on a weekly basis for 6, 8 or 12 weeks to participate in one- to two-hour sessions that taught different memory strategies. Participants were then encouraged to practice the new skill they learned throughout the following week, allowing them to apply the strategy in real life situations. MÉMO program participants showed dramatic improvements in memory - and remember, these were not healthy seniors, they were people already showing early signs of dementia.

Neuroimaging has been used to watch what is happening in the brain during interventions of this type. “What we see is that, even in older people, even among people who are in the early stages of Alzheimer’s, there is an increase in activity in alternate regions of the brain during memory training,” describes Belleville. “Memory training is increasing the activity in new regions of the brain, putting in motion a new process to store information and improve memory.” This is evidence that brain plasticity is present even in early Alzheimer’s patients.

There is a lot you can do on your own to integrate new learning and creativity into your life, stimulating your brain and building cognitive reserve. Belleville recommends choosing activities that are pleasurable and interesting for you. To improve your memory and language skills, she suggests joining a book club, learning a new language or writing your autobiography. To improve your attention skills, she suggests playing video games, playing chess or Sudoku. Physical activities and creative pursuits are great as well, such as joining a walking club, doing tai chi, learning to tango or joining a choir.

The brain remains plastic - able to change and grow - well into old age. **It’s never too late to introduce new activities into your life to stimulate your brain and build cognitive reserve.** Doing so will help you prevent cognitive decline, reduce the risk of developing dementia, and help keep you thriving and independent as you get older. 🧠



Sylvie Belleville, PhD
Full professor, Psychology Dept, Université de Montréal, Researcher & Research Director, Institut Universitaire de gériatrie de Montréal

DEMENTIA OR SIMPLE ABSENT-MINDEDNESS?

QUICK QUIZZES MAY REVEAL IF YOU'RE AT RISK FOR ALZHEIMER'S

Currently Alzheimer's is only diagnosed through in depth cognitive testing, but there are several self-administered tests available that may spot the early signs of Alzheimer's disease.

These small home-tests present indications of Alzheimer's or dementia but are no substitute for visiting your physician at the first sign of progressive memory loss. These tests can also be taken at home by patients who can then share the results with their physicians to help spot early symptoms of cognitive issues.

Diagnosing Alzheimer's early is vital for receiving medications to delay symptoms and prolong life. An early diagnosis also gives the patient the opportunity to contribute to many of the decisions that will need to be made later.

15-MINUTE TEST

Dr. Douglas Scharre and his team at Ohio State University developed a 15-minute test that they claim correlated well with detailed cognitive testing.

The exam can be completed online or by hand and tests language ability, reasoning, problem solving skills and memory. Results can then be shared with doctors to help spot early symptoms of cognitive issues such as early dementia or Alzheimer's disease.

The SAGE test can be downloaded at <http://bit.ly/JUObaP>

21-QUESTION TEST

Another test, devised by Banner Sun Health Research Institute in Arizona, claims to distinguish between normal absent-mindedness and the more sinister memory lapses that may signal the early stages of dementia.

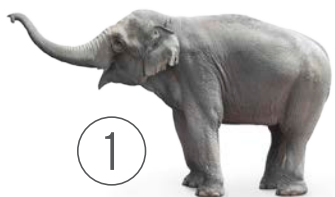
The questions are designed to be answered by a spouse or close friend. The 21 questions are answered with a simple 'yes' or 'no'. A 'yes' is given a score of one or two and a 'no' always scores zero, giving a maximum possible score of 27.

Pick 1 answer each of the 21 questions and note down the corresponding number of points. Then add up all the points to give a total score out of 27. Someone who scores under five is advised that there is no cause for concern. A score of five to 14 suggests mild cognitive impairment or memory lapses that could be the early stages of Alzheimer's.

1. **Does your loved one have memory loss?** Y = 1 N = 0
2. **If so, is their memory worse than a few years ago?** Y = 1 N = 0
3. **Do they repeat statements or stories in the same day?** Y = 2 N = 0
4. **Have you had to take over tracking events or appointments, or does the patient forget appointments?** Y = 1 N = 0
5. **Do they misplace items more than once a month?** Y = 1 N = 0
6. **Do they suspect others of hiding, or stealing items when they cannot find them?** Y = 1 N = 0
7. **Does your loved one frequently have trouble knowing the day, date, month, year, and time; or check the date more than once a day?** Y = 2 N = 0
8. **Do they become disoriented in unfamiliar places?** Y = 1 N = 0
9. **Do they become more confused when not at home or when traveling?** Y = 1 N = 0
10. **Excluding physical limitations, do they have trouble handling money, such as tips or calculating change?** Y = 1 N = 0
11. **Do they have trouble paying bills or doing finances?** Y = 2 N = 0
12. **Does your loved one have trouble remembering to take medicines or keeping track of medications taken?** Y = 1 N = 0
13. **Do they have difficulty driving; or are you concerned about their driving?** Y = 1 N = 0
14. **Are they having trouble using appliances, such as the stove, phone, remote control or microwave?** Y = 1 N = 0
15. **Excluding physical limitations, are they having difficulty completing home repair or housekeeping tasks?** Y = 1 N = 0
16. **Excluding physical limitations, have they given up or cut down on hobbies such as golf, dancing, exercise or crafts?** Y = 1 N = 0
17. **Are they getting lost in familiar surroundings, such as their own neighbourhood?** Y = 2 N = 0
18. **Is their sense of direction failing?** Y = 1 N = 0
19. **Do they have trouble finding words other than names?** Y = 1 N = 0
20. **Do they confuse names of family members or friends?** Y = 2 N = 0
21. **Do they have trouble recognizing familiar people?** Y = 2 N = 0

A SIMPLE WORD TEST

This is a simple word test that may help in the early diagnosis of Alzheimer's. It deals with the way in which our brain saves and stores memories. Since some words are learned earlier in childhood and used more frequently in adulthood, certain words will be more difficult for the Alzheimer's patient to recall. Word association tests such as this seem to work well in detecting early stage Alzheimer's.



First ask the individual to name all the animals they can think of in one minute.

Then ask her/him to name all the types of fruit they can remember in one minute.

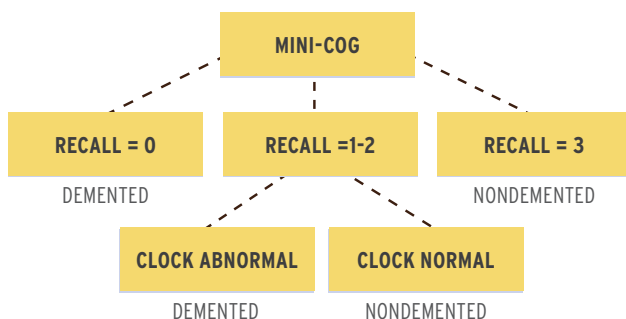
Researchers have found that people with early Alzheimer's are able to list only 10 to 15 words in contrast to the 20 to 25 words from a healthy individual.

THE MINI-COG TEST

The Mini-Cog test is also a simple but highly recommended test for Alzheimer's. This 3-minute instrument can screen for cognitive impairment in older adults in the primary care setting. The Mini-Cog uses a three-item recall test for memory and the clock-drawing test (CDT).

- The patient is instructed to listen carefully and repeat the following; APPLE WATCH PENNY**
- The Clock Drawing Test is administered.**
- The patient is asked to repeat the three words given previously.**

SCORING:



It's important to note that these tests are not designed to diagnose dementia, and people who are worried about their memory should seek advice from a doctor rather than attempting self-diagnosis with a test at home.

THE CLOCK DRAWING TEST

Another test that is often given by a qualified physician is the Clock Drawing Test (CDT).

The person undergoing testing is asked to draw a clock, put in all the numbers and set the hands at ten past eleven.

There are a number of scoring systems for this test. The Alzheimer's disease cooperative scoring system is based on a score of five points. **A normal score is four or five points.**

The test can provide huge amounts of information about general cognitive and adaptive functioning such as memory, how people are able to process information and vision. A normal clock drawing almost always predicts that a person's cognitive abilities are within normal limits.

Research varies on the ability of the Clock Drawing Test to differentiate between, for example, vascular dementia and Alzheimer's disease.



BOOST

your

BRAIN

WITH FOOD

Most people know that diet impacts heart health, but fewer people realize that the brain is also affected by what you eat. As a part of your physical body, your brain relies on the food you eat to stay healthy, just as your heart does.



ADOPT A MEDITERRANEAN-STYLE DIET

On a broad scale, Registered Dietician Leslie Beck recommends, “one of the best things people can do to keep their brains healthy is to adopt a Mediterranean-style diet.” Studies have shown that people who follow a Mediterranean-style diet closely experience slower cognitive decline as they age, reduced risk of mild cognitive impairment (MCI) and reduced risk of any MCI progressing into Alzheimer’s disease.

The Mediterranean diet is rich in vegetables and fruits, whole grains, legumes, nuts and fish. Red meat is eaten only a few times a month. The major source of fat is olive oil. Beck explains the benefits of this type of diet, “It’s low in saturated fat, and includes plenty of anti-inflammatory foods and lots of antioxidants as well.”

It is not clear exactly why following a Mediterranean diet may protect brain function, but researchers think that it may work by improving cholesterol and blood sugar levels as well as overall blood vessel health, all of which are factors that may reduce the risk of Alzheimer’s Disease.

Research about nutrition is ever evolving, and sometimes the latest findings conflict with previous results, making it confusing to wade through all of the recommendations and determine what you should be eating. To shed some light on how to eat well for brain health, Leslie Beck, a Registered Dietitian and author of 12 books on healthy eating, shares the latest information to help you choose foods that will give your brain a boost.

MANY OF THE MAIN CONTRIBUTING FACTORS LEADING TO COGNITIVE DECLINE AND DEMENTIA CAN BE ADDRESSED THROUGH FOOD:

- 1 Oxidative stress - eating a diet rich in antioxidants can help.
- 2 High blood sugar or diabetes - limiting sugar and choosing low glycemic foods that don’t spike your blood sugar are good strategies.
- 3 Inflammation - consuming things like omega 3 fatty acids and mono-unsaturated fats can help.
- 4 Risk factors for cardiovascular disease such as high blood pressure and cholesterol - eating foods that protect your heart and arteries will protect your brain as well.

FOODS FOR THOUGHT: EAT MORE OF THESE BRAIN-BOOSTING SUPER FOODS

Certain foods are particularly strong choices for boosting brain function and warding off cognitive decline. Beck recommends trying to include these super foods in your diet to give your brain a boost:



OILY FISH - To get more omega 3 fatty acids in your diet, consume oily fish such as salmon, trout or sardines on a regular basis. There is

more than one type of omega 3 fatty acid. The one that is of particular importance for brain health is called DHA (docosahexaenoic acid), the fatty acid that is concentrated in the brain. It helps keep brain cell membranes flexible so that memory messages can pass easily between them. To get your blood level of DHA to a concentration required for cardiovascular protective benefits, **you should be eating about 12 ounces per week of an oily fish like salmon.** If you're not consuming that amount, take a fish oil supplement. If you're going to buy an omega oil supplement, Beck advises avoiding the omega 3/6/9 products and choosing a pure omega 3 supplement made from fish oil, since omega 6s and 9s are pretty widespread in our food supply. If you are vegetarian, take a DHA supplement made from algae; note that this is different from the

omega 3 that can be found in flax oil, which is ALA (alpha-linolenic acid).



LEAFY GREENS

- A large study, done with adults 65+, found that men and women who ate more than two vegeta-

ble servings per day had a 40 percent lower rate of cognitive decline. The most protective vegetables were found to be leafy green vegetables such as arugula, kale, rapini, spinach and swiss chard. So, Beck advises her clients to **aim to have leafy green vegetables at least four times a week.** Cooked is better than raw, making more of the antioxidants and minerals available for absorption. "Try adding them to soups or pasta sauces, or throw a bunch of baby kale in a pot of chili, all of those things that are so easy to do," suggests Beck.



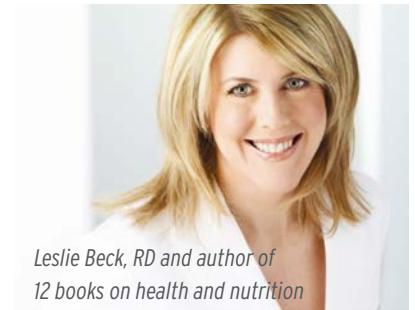
BERRIES & WALNUTS -

Berries and walnuts are rich in antioxidants called polyphenols which en-

hance the action of microglia cells in the brain. The microglia's role is to help remove

toxic proteins from the brain that accumulate with age. These toxic proteins, if left to accumulate, have a negative impact on brain function. Polyphenols seem to activate or enhance this natural housecleaning process that takes place in the brain. All kinds of berries are good sources of polyphenols but so are other fruits such as plums, pomegranate seeds, prunes and red grapes. A walnut-rich diet was shown, in a US study, to reverse age-related motor and cognitive decline in aged rats. The researchers attributed these improvements to the polyphenols in the walnuts. While walnuts were the only nuts studied, Beck would also recommend almonds, hazelnuts and peanuts because of the vitamin E they contain. **Consuming foods rich in vitamin E, an antioxidant, on a daily basis will help protect your brain cells from oxidative damage.**

Other foods high in vitamin E are sunflower seeds, sunflower oil, safflower oil and grapeseed oil. 🌱



Leslie Beck, RD and author of 12 books on health and nutrition

LESLIE BECK PHOTOGRAPH: LORELLA ZANETTI PHOTOGRAPHY



TAKE A DAILY SUPPLEMENT

"The other thing I usually recommend is a multivitamin and mineral, just a broad-based low dose formula that gives you a little bit of everything," advises Beck. "It helps ensure that you're covered for your B vitamins, in particular, folate and B12." This is important because deficiencies in some of the B vitamins have been linked to cognitive impairment and stroke. After the age of 50, it becomes more difficult to get your B12 from food because of reduced production of stomach acid, so it is advised that older adults get their B12 from a multivitamin.

TIPS FOR CHANGING YOUR DIET

Changing life-long habits, especially diet, is not easy. Beck offers these tips for helping with a transition to brain-healthy eating:

Start with one or two changes a week. Choose something that totally makes sense to you. For example, maybe you rarely have salmon but you really like it, so make a plan to include it in your diet regularly.

Set small goals and make them very specific. Don't just say I'm going to eat a healthier diet. List off exactly how you're going to do it. And then build on your plan, gradually over time.

Focus on adding healthy foods to your diet rather than setting a bunch of restrictions about what you shouldn't eat. By the time you've eaten all the healthy new foods, you may find yourself with no appetite left for the less healthy options.

MEMORY MORSELS

SPINACH is rich in vitamins A and K, folic acid and iron, and is packed with at least 15 different antioxidant compounds known as flavonoids, which have been shown to inhibit the formation of the beta-amyloid plaques that build up in those with Alzheimer's disease.

MOTHER'S DAY MENU

MARK MCEWAN'S SPINACH SALAD WITH TUNA, RADISHES AND CARA CARA ORANGES

Prep time: 20 minutes Cook time: 2 minutes Serving: 6

INGREDIENTS

1 1/2 LBS	baby spinach	3	cara cara oranges, cut into segments
10	leaves raddichio	3 TBSP	chives, chopped
1/2 cup	mixed celery and parsley leaves	1/2 cup	red wine vinaigrette
3	oregano leaves		
4	heirloom radishes, sliced thin	Red Wine Vinaigrette:	
2	cans quality tuna packed in olive oil	1 cup	extra virgin olive oil
		1/3 cup	red wine vinegar

Directions: Combine all ingredients and toss with vinaigrette. Adjust seasoning with Salt and Pepper to taste.



BLUEBERRY BASIL KALE SMOOTHIE

Prep time: 5 minutes Cook time: 0 minutes Serving: 4

INGREDIENTS

1 cup	soy milk
1 1/2 cup	pomegranate juice
1/2 cup	blueberries
1/2 cup	raspberries
1/2	cucumber
1	handful fresh basil, whole
5	fresh kale leaves
1 TBSP	real maple syrup
3/4 cup	ice cubes

Directions: Peel cucumber and chop in 2-3 inch pieces. Add to blender with raspberries, blueberries, basil, kale, and pomegranate juice. Blend until smooth, then add soy milk, maple syrup and ice cubes. Continue to blend until fully combined and smooth.

Nutrition is incredibly important for your brain. The earlier you start focusing on your brain health, the better the cognitive outcome. Studies have shown that a Mediterranean diet can reduce inflammation, oxidative stress, & other vascular risk factors for brain & heart diseases. Our Memory Morsels campaign includes custom recipes and superfood-driven menus to enhance brain health and boost important vitamins and antioxidants - and they're simple to prepare.

Because our grey matter matters, you can help our cause by hosting a Memory Morsels get together. What better way to boost energy than a home cooked party with a purpose? Instead of hostess gifts, encourage your guests to make a donation to the Women's Brain Health Initiative in support of the Memory Morsels campaign - any amount is appreciated. Collect pledges the same way you would for a marathon or climb, but this time - thank your contributors with a glorious brain-healthy meal!

For more recipes, brain-healthy superfoods and party ideas, please visit memorymorsels.org



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HOW COULD YOU EVER
FORGET A FACE
LIKE THIS?
EASY.

IF HER MOTHER CAN
FORGET, ANYONE CAN.

Every year, millions of mothers will disappear without ever leaving the room. In fact, 70% of Alzheimer's patients will be women, with the number of dementia victims expected to triple by 2050.

This Mother's day, support the Initiative.
Wear a Hope-Knot.

WILL YOU FORGET? WE HOPE-KNOT.



THE HOPE-KNOT

PROJECT

TO COMBAT WOMEN'S BRAIN AGING DISORDERS

Hope-Knot is a registered trademark of the Women's Brain Health Initiative.

100% of proceeds from every Hope-Knot sold helps support gender-based brain aging research. HOPEKNOT.ORG