

MIND ^{OVER} MATTER[®]



IS YOUR MOM
**BURNING
OUT?**

**MILLENNIALS
HAVE THE POWER TO
PREVENT THEIR OWN
COGNITIVE DECLINE**

**ADVANTAGES OF
AN AGING BRAIN
IN THE WORKFORCE**

**BEYOND
MEMORY LOSS**

**HER STRESS
VS HIS STRESS**

Insight into the latest research findings to combat brain aging diseases and what you need to *stay brain healthy longer.*

**NEW RESEARCH CHAIR
IN WOMEN'S BRAIN HEALTH & AGING**





Brain Canada
Foundation

WITH GRATITUDE

THIS EDITION OF MIND OVER MATTER® WAS MADE POSSIBLE THANKS TO THE ENCOURAGEMENT AND SUPPORT OF INEZ JABALPURWALA, THE BRAIN CANADA FOUNDATION AND HEALTH CANADA

Brain disorders directly impact 1 in 3 Canadians and carry an economic burden of about \$60 billion annually—which is greater than the burden of cancer and cardiovascular disease combined.

Since its founding almost 20 years ago, the Brain Canada Foundation (“Brain Canada”), has been the catalyst to a quarter of a billion dollars in new funds for brain research, focusing on prevention, diagnostics, treatments and, ultimately cures, for the benefit of all Canadians.

From 2012 to the publication of this magazine, Brain Canada—with funds from private donors, partner organizations and matched by Health Canada—has awarded \$176.2 million in new funding to support 166 projects across Canada involving more than 750 researchers at 70 institutions.

While the long-term search for treatments and cures continues, Brain Canada recog-

nizes the importance of prevention, which impacts quality of life today and for the future. We understand that it is essential to include sex and gender considerations in research, and we want to share data and discoveries on more open platforms, to drive innovation further and faster.

Currently, only a limited proportion of research projects include sex and gender, but initiatives are emerging to change this situation. Knowing that women are more prone to be living with dementia, with about 70% of all cases worldwide, and thanks to the efforts of Women’s Brain Health Initiative, attention and extra funding is now being focused on women, dementia and brain health. Brain Canada is dedicated to this cause and will develop research programs in the near future that will explore sex differences in brain health and disease. This focus promises to improve the impact of brain research and to improve the health and quality-of-life for millions of women.

There has never been a more exciting time for brain research in Canada and globally. And with greater understanding about brain function, we are tackling the disorders, which place such an enormous burden on individuals, family, the economy and society, while simultaneously advancing our understanding of what we can do to keep our brains healthy.

Mind Over Matter® is a tremendous resource for caregivers, for those who may be worried about their own cognitive vitality, and for those who want to maintain their brain health as long as possible. On behalf of Brain Canada, I am delighted to be partnering with Women’s Brain Health Initiative and on this issue of Mind Over Matter®.

Inez Jabalpurwala,
President and CEO,
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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 the principal of Align Creative Minds and a yogi at heart, who strives to live a well balanced lifestyle. "As a designer, you learn a wealth of knowledge from your clients over time. Working with WBHI has positively influenced my daily life. My cooking skills have even been taken to a new level, thanks to Memory Morsels! I am proud to creatively help spread awareness and knowledge for women to lead 'brain healthy' lifestyles."



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Susanne is a marketing/communications agency and events professional, with a solid appreciation for smart thinking. A believer in life balance and healthy body and mind, Susanne is also a passionate advocate for giving back. "As a business woman, wife, mother, daughter and friend, I am inspired by the impact of WBHI and the collaborative opportunities to make a real difference."



TAIGA LIPSON & SASHA KORPER | ON THE COVER

Taiga and Sasha are part of three generations of women running the Olga Korper Gallery in Toronto. The stories and memories that bind them to one another are their greatest family legacy, and why they are most honored to participate in Mind Over Matter. *(Photo: Jaylyn Todd)*



JOANNE KORTEN | EXECUTIVE DIRECTOR

JoAnne is responsible for strategic partnerships with regional, national and global leaders concerned about protecting women's brain health. JoAnne is committed to raising the funds required to support necessary sex-gender research, and dedicated to enhancing the lives of those touched by Alzheimer's and dementia, and supporting the caregivers who love them.

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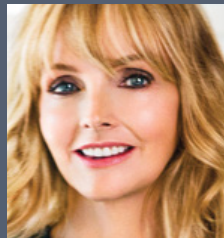
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EDITOR'S LETTER

Can't remember why you walked into a room?

For women in their 40s and 50s, issues with memory retrieval are normal, and usually they are temporary. The problem for a lot of us is that we don't know this. In fact, most of us don't know much about the difference between normal blips in brain function and signs of dementia.

Women's Brain Health Initiative (WBHI) is taking a leadership position to advocate for women, to influence scientific research that will impact women's brain health and, most importantly, to educate women about their own aging brains.

Alzheimer's is not an equal opportunity disease when it comes to men and women.

Women are almost twice as likely as men to be living with dementia, representing almost 70% of all cases worldwide. This can be explained by two important facts: women live longer, and age is the most important risk factor. But longevity alone is not adequate enough to explain why far more women are likely to develop the disease and to decline more rapidly compared to men.

This is a huge issue for women, yet not enough researchers are looking at biological sex differences in brain changes. Currently, only a small proportion of national and international research efforts include sex and gender variables in their analyses. **How can the quest for personalized medicine be justified if females are excluded in scientific discovery?** Unless scientists can identify the unique brain health needs of women, how can they help us preserve our cognitive function?

WHAT CAN WE DO TO ENSURE SCIENTISTS ARE LISTENING TO US? Our supporters have helped us to influence the science. Women's

Brain Health Initiative's partnership with the Canadian Consortium on Neurodegeneration in Aging, and University Health Network's Age-Well program has been made possible because of donors like you.

Women's Brain Health Initiative's focus on education continues to give you the most up-to-date information, with programs that include our Mind Over Matter® magazine that brings cutting-edge scientists to your doorstep, and our Mentoring Millennial Minds program that encourages the Y Generation to start protecting their brain health now, to avoid the mind-robbing diseases that are impacting Boomers.



Through collaboration, alliances, membership and partnership, WBHI is galvanizing thought leaders, generous philanthropists and industry trailblazers around the globe who share a passion for protecting women's brain health so that we can do more and reach more.

You and I need to invest in the brain health of the women who are important in our lives: our mothers, our sisters, our daughters and our best friends.

We need to show we care by donating to Women's Brain Health Initiative.

Thank you for your help. Together we will defeat brain-aging diseases like Alzheimer's that affect so many women, as victims and as caregivers.

A handwritten signature in black ink that reads "Lynn".

Lynn Posluns
Founder and President, Women's Brain Health Initiative
Editor and Publisher, MIND OVER MATTER®



DEMENTIA IS NOT INEVITABLE

The Choices You Make
Can Lower Your Risk

Nearly 60 percent of people worldwide believe that Alzheimer's is unavoidable.

Contrary to popular belief, Alzheimer's and other forms of dementia are not an inevitable part of aging. True, almost everyone forgets things occasionally from middle age onward. But not everyone develops a brain disorder that affects cognition (thinking ability), including memory, judgment, and eventually personality and behaviour --

which is what Alzheimer's is. Millions of people reach their 70s, 80s, and even 90s with good memories and relatively little decline in mental abilities.

According to an Alzheimer's Association 12-country survey, 59 percent of people surveyed believed incorrectly that Alzheimer's

disease is a typical part of aging and 40 percent of people believe that Alzheimer's is not fatal.

The Alzheimer's & Brain Awareness Month International Survey released in March 2014, conducted in Australia, Brazil, Canada, China, Denmark, Germany, Japan, India, Mexico, Nigeria, Saudi Arabia and the United King-

dom, also found that 37 percent of people surveyed have the misconception that you have to have a family history to be at risk for Alzheimer's and

heimer's Research UK Conference in Manchester in March 2016, Professor Alistair Burns, National Clinical Director for Dementia at NHS England, highlighted the potential for a healthy lifestyle to lower the risk of dementia and called for messages about risk reduction to be promoted to the public.

PUBLIC UNDERSTANDING OF DEMENTIA RISK FACTORS IS LOW

Professor Burns addressed the largest gathering of dementia researchers in the country and urged more research into ways to prevent dementia, stating: "figures show that public understanding of dementia risk factors is low, and we must work to change that if we are to help reduce the number of people developing the condition. Encouragingly, these figures suggest that when given

the right information, many people are motivated to make lifestyle choices to help lower their dementia risk - but **currently too few people recognize that they may be able to make an impact.** We must arm people with the knowledge they need to make informed choices about their lifestyle, as part of a wider strategy that must also include further research into preventions."

National Director, Health and Wellbeing at Public Health England, Professor Kevin Fenton added: "Developing dementia is not an inevitable part of ageing. Making better choices today can have a huge influence on our health and can reduce our risk of living with dementia later down the line. This includes things like eating well, moving more, quitting smoking and drinking less."

MAKING BETTER CHOICES TODAY

GET MOVING - One of the key things we can do to keep our brains young is to engage in some sort of physical exercise. Higher exercise levels can reduce dementia risk by 30 - 40%. Physically active people tend to have better cognitive function and memory. Physical activity can also trigger the growth of new nerve cells and promote nerve growth. Even a little exercise is better than none...15 minutes of regular exercise three times a week can help maintain the brain.

PUMP SOME IRON - Studies have shown lifting weights, even light weights, have increased cognitive function and increased the levels of growth factors in the brain, such as IGF1 (insulin-like growth factor 1) which nourish and protect nerve cells.

LEARNING - When we challenge the brain, we increase the number of brain cells and the number of connections between those cells. It is not enough to do things like crossword puzzles if this is something you routinely do. You have to learn new things like Sudoku or a new language. Engaging the mind can help older brains maintain healthy functioning.

REDUCE STRESS - Chronic stress floods our brains with the stress hormone cortisol, which if activated too often, leads to impaired memory. Harvard researchers studied men and women trained in meditation and found they had reduced harmful stress hormones compared to individuals who were not taking "down time" to reduce the stress in their lives.

Bottom line, the things that we keep hearing about - exercising, reducing stress, etc. - seem to have way more positives than negatives. So what do you have to lose? Get out there and "move your body"! 🧠

nearly a quarter (24 percent) of Americans hold the same mistaken belief, despite advancing age being the greatest risk factor for Alzheimer's.

Speaking in his opening speech at the Alz-



If you live long enough you'll make mistakes. But if you learn from them, you'll be a better person. It's how you handle adversity, not how it affects you. The main thing is never quit, never quit, never quit." - William J. Clinton

THE SUPERAGERS

Exceptional Health Into Old Age Is Possible

It is widely believed that cognitive abilities inevitably decline with age, but is that really true? Certainly, many older people do experience declining memory and thinking abilities as time goes on, but there are some elderly people who defy the norm, and researchers are studying them more closely than ever to learn what keeps their brains so healthy compared to their peers. Discovering the biological secrets behind their healthy brains may help in the development of treatments that prevent or reverse dementia.

THE SUPERAGERS

Researchers at Northwestern University Feinberg School of Medicine in Chicago have been studying the brains of cognitively elite elders, referred to as “SuperAgers.” Study participants that display exceptional episodic memory, meaning they can recollect personal experiences and events, and all associated contexts and emotions with no difficulty, are **RARE INDIVIDUALS WITH MEMORIES THAT ARE “AS SHARP AS THOSE OF HEALTHY PERSONS DECADES YOUNGER,”** according to the university’s press release about the research. And, it turns out their brains have structural differences that make them unique. Research so far has revealed:

The SuperAgers’ cortex was much thicker than the cortex of cognitively-normal individuals aged 80+; it was actually similar in thickness to what is typical in people 20 to 30 years younger. (The cortex is the outer layer of the brain, and is important for memory, attention and other thinking abilities.)

SuperAgers have unusually low density of the tangles* associated with Alzheimer’s disease.

SuperAgers have an unusually high supply of a particular neuron, *von Economo*, which is linked to social intelligence.

These findings point to potential biological factors that may be keeping the SuperAgers’ brains so healthy. At this point though, it is unclear why SuperAgers’ brains are different. Additional research is underway to further understand what makes SuperAgers so unique.

THE WELDERLY

The Wellderly study, conducted by researchers from the Scripps Translational Science Institute in California, examined what is unique about the genetics of exceptionally healthy older adults. Participants in the study, referred to as “Wellderly” because of their unusual health for their age, were between 80 and 105 years old, and free from any significant chronic medical condition such as dementia, heart disease and diabetes. DNA analyses were conducted on the genomes of 511 Wellderly participants and 686 adults who were part of a separate study (and represented the general population).

The analysis comparing the two groups took eight years and revealed a higher-than-normal presence of genetic variants that offer protection from cognitive decline among the Wellderly participants. This suggests a potential **LINK BETWEEN LONG-TERM COGNITIVE HEALTH AND PROTECTION FROM CHRONIC DISEASES.** The researchers suggest that the gene variants discovered “might offer a pathway for the development of new treatments for Alzheimer’s.”

HEALTHY ITALIAN CENTENARIANS

Researchers from the University of California, San Diego School of Medicine (UCSD) are teaming up with colleagues from University of Rome La Sapienza to study a group of 300 centenarians living in a remote Italian village, Acciaroli. Not only are these residents over 100 years old, they are also “known to have very low rates of heart disease and Alzheimer’s,” according to a UCSD article that announced the project in March 2016. Part of what makes this village so interesting is that there are 300 centenarians among a total population of only 2,000, representing a staggering 15% of the population. As a comparison, the percentage in the United State is only a low 0.02%. This aims to be a long-term study that includes a full genetic analysis and an examination of lifestyle factors, such as diet and exercise, in an attempt to determine why this group is living so long and staying so healthy in the hopes that the biological secret will be revealed. 🧠

* According to the Alzheimer’s Association, tangles are twisted strands that form when tau protein necessary to keep cells healthy collapses.



SIGNS OF COMPROMISED BRAIN HEALTH

Physical Performance Tests That Can Predict Dementia



In the last issue of Mind Over Matter® “The Eyes (and Nose) Have It” article, Women’s Brain Health Initiative explored the current research on smell and eye assessments for predicting the future risk of dementia. There are other types of risk prediction testing that hold promise as well. In this article, Women’s Brain Health Initiative examines two studies using tests of physical performance, such as balance and walking speed, to predict future cognitive decline.

Research has revealed

TWO PARALLEL LINKS BETWEEN PHYSICAL PERFORMANCE AND COGNITIVE DECLINE.

A lower level of motor function is a known risk factor for developing mild cognitive impairment (MCI), an intermediate stage between the expected cognitive decline of normal aging and the more seri-

ous decline of dementia. On the flip side, a lower level of cognitive function is a known risk factor for developing motor impairment, especially falls and more rapid decline in motor function. Given the interconnection between motor function and cognitive function, it’s not surprising that researchers are investigating how physical performance testing might be used to help predict who is at increased risk of developing dementia.

FOUR SIMPLE PHYSICAL TESTS MAY INDICATE RISK OF DEMENTIA

A study conducted by researchers from University of California Irvine (UCI) between January 2003 and November 2009 examined the physical performance of 629 individuals aged 90+ using four measures: grip strength, standing balance, a timed four-metre walk, and ability to do five chair stands (i.e. stand from a sitting position with arms folded across the chest). Each task was scored from 0 (unable to perform) to 4 (best performance). The results, published in *JAMA Neurology* in January 2013, revealed that poor performance >>

in any of the measures was associated with increased odds of dementia.

“The most notable effect was seen in poor performance on the 4-metre walk test,” explained Dr. Szofia Bullain, study leader and an Assistant Professor in UCI’s Department of Neurology. “Participants who were unable to walk (score 0) were almost 30 times more likely to have dementia than people who walked the fastest (score 4). However, even a minimal decrease in walking speed, from a score of 4 to 3, resulted in four times greater odds of dementia.” Poor performance in doing five chair stands had the next highest odds of increasing dementia risk, followed by grip strength, then balance.



“Our findings revealed that dementia is a complicated process that may affect both cognition and physical performance,” explained Dr. Bullain, “however, because of the design of the study, it is unknown if a decreasing ability to perform physical tasks is a cause or a result of dementia.” Although the exact nature of the relationship between physical and mental performance is not yet fully understood, this research suggests that physical performance may be a potentially modifiable risk factor for late-age dementia, meaning there is something you can do about it to possibly decrease risk. Since it is a potentially modifiable risk factor, it doesn’t hurt for people to focus on improving their physical fitness levels while waiting for additional research to reveal more.

COGNITIVE COMPLAINTS & WALKING SPEED COMBINED SERVE AS A SIMPLE TEST OF DEMENTIA RISK

Researchers with Albert Einstein College of Medicine of Yeshiva University and Montefiore Medical Center, both in New York, have assessed the prevalence of motoric cognitive risk syndrome (MCR),

a newly described pre-dementia syndrome characterized by slow walking speed (gait) and cognitive complaints, and explored MCR’s link with dementia risk. Their study, published online on July 16, 2014 in *Neurology*, involved almost 27,000 adults aged 60+ (without dementia or disability) enrolled in 22 studies across 17 countries. It found that 9.7% of the participants met the criteria for MCR based on a simple test of how fast they walked and whether they had cognitive complaints.

To test if MCR can be used to predict future dementia, the researchers focused on four of the 22 studies, evaluating over 4,800 people annually over an average follow-up period of 12 years to see who developed dementia. Those diagnosed with MCR were almost twice as likely to develop dementia over the 12 years compared with those who did not meet the MCR criteria.

The conclusion of the *Neurology* paper sums up the findings, “MCR is common in older adults, and is a strong and early risk factor for cognitive decline.”

What is particularly exciting about these findings is that the test to diagnose MCR is so quick and easy. It takes just seconds to measure the speed of someone walking and ask a few simple questions about their cognitive functioning. Plus,

THE TEST DOES NOT REQUIRE ANY MEDICAL TECHNOLOGY, DOES NOT HAVE TO BE ADMINISTERED BY A NEUROLOGIST, AND CAN BE DONE RIGHT IN A DOCTOR’S OFFICE,

so it could easily be incorporated into regular examinations with older patients.

“It is important to keep in mind that identifying MCR is not the same as diagnosing someone with dementia. It simply alerts a person and their health care team of the higher risk for developing dementia. Knowing you are at risk can prompt investigation of potential underlying conditions that could be treated and motivate healthy lifestyle changes, possibly delaying or even preventing the onset of dementia,” explained the senior author of the paper, Dr. Joe Verghese, Professor at Einstein and Chief of Geriatrics at Einstein and Montefiore.

This continued awareness, and in some ways the simplicity (and cost effectiveness) of actually doing physical performance (and smell and eye) assessments keeps us on the right path to predicting future cognitive decline and increasing the numbers of people getting diagnosed early. 🧠

THE ROLE OF INFLAMMATION IN ALZHEIMER'S DISEASE

Alzheimer's disease (AD), the most common form of dementia, is characterized by two abnormal structures found in the brain--amyloid beta (A β) plaques and tau protein tangles--as well as inflammation. Inflammation is the body's response to injury - it works positively to heal wounds, but it can also have a negative impact in some chronic diseases, Alzheimer's being one of them.

Much research has focused on the structural changes involved in Alzheimer's disease (i.e. the plaques and tangles). The amyloid hypothesis suggests that the accumulation of A β triggers a cascade of neurochemical events that negatively impact the functioning of brain neurons and synapses, leading to cognitive decline. If the amyloid hypothesis were accurate, one would expect clinical treatments targeting the elimination of A β to be successful at addressing symptoms and/or reversing the condition, but that has not been the case.

Furthermore, some believe that the current drug treatments available are being administered too late in the pathology of the disease to be effective. According to Mark E. McCaulley and Kira A. Grush (in their 2015 article "Alzheimer's Disease: Exploring the Role of Inflammation and Implications for Treatment" published in *International Journal of Alzheimer's Disease*), "so far, anti-A β clinical efforts have largely failed to meet primary clinical endpoints and, in some cases, have actually worsened dementia." >>



Research has confirmed there is a relationship of some kind between Alzheimer's disease and A β plaques, but the exact nature of that relationship is uncertain. It's possible that it's not a causal relationship; in other words, perhaps the amyloid hypothesis is incorrect and A β accumulation does not begin the cascade of events in the brain leading to Alzheimer's disease. McCaulley and Grush describe how some of the

PROMISING RESEARCH IS NOW POINTING TO A DIFFERENT POTENTIAL CAUSAL FACTOR, INFLAMMATION.

It is clear that an inflammatory process is occurring in the brains of people with Alzheimer's disease because activated microglia are seen in their brains. Microglia are the brain's primary immune cells. They respond to 'invaders' (such as AD plaques and tangles) and injury by becoming activated - proliferating in numbers and migrating to the site of infection or injury then destroying any invading pathogens and removing damaged cells.

FRIEND OR FOE?

Short-term inflammation is generally positive. When inflammation does its job properly, it deals with the invading foreign bodies that shouldn't be there and then the inflammatory process ends. In the case of the Alzheimer's brain though, ongoing deposition of A β registers as constant detection of an 'invader,' and so the inflammation process becomes chronic, continuing without resolution.

When inflammation becomes chronic, it appears that microglia do their job with such enthusiasm that they may be causing harm to healthy cells, leading to controversy in the scientific community around whether microglia are friend or foe to the brain.

The idea that inflammation is an immune response to the presence of A β is likely true. But research indicates that the relationship between inflammation and AD plaques and tangles is probably more complex than that. The latest research (published in the journal *Brain* in January 2016) supports the notion that inflammation in the brain may not be caused by the disease but instead could be driving the disorder. Researchers at the University of Southampton, England, in an experiment with mice bred to develop features of Alzheimer's disease, discovered that blocking the receptor responsible for regulating microglia (CSF1R) resulted in fewer memory and behavioural problems in the treated mice.

Overall, the research findings suggest that **by reducing the inflammation, progression of AD could be halted**. The research team is hopeful that the findings will lead to an effective new treatment for Alzheimer's disease, although it will be critical to work closely with

industry partners to find a safe drug that can be tested in humans.

Other research supports the possibility that treatments aimed at reducing inflammation may be effective at reducing the risk of Alzheimer's disease. Because non-steroidal anti-inflammatory drugs (NSAIDs) such as aspirin and ibuprofen are commonly used in modern societies, they have been evaluated for their potential influence on AD.

The studies have mostly suggested a positive impact. A 2003 analysis of multiple studies of NSAID impacts on Alzheimer's disease risk, published in the *British Medical Journal*, reported that longer-term use of NSAIDs (24+ months) was associated with a 73 percent reduction in AD incidence. It is important to note, however, that research findings have not all been positive with regard to NSAIDs. In some patients, the drugs made their symptoms worse. The benefits seem to be limited to people who have not yet developed more severe AD.

The inflammatory mechanisms involved in Alzheimer's disease are complex, making it challenging to develop appropriate therapies. Given the critical role short-term inflammation has in keeping your entire body healthy,

SIMPLY SUPPRESSING THE INFLAMMATION PROCESS MAY RESULT IN MORE HARM THAN GOOD.

More research is needed to fully understand the role of inflammation in AD, and to figure out how to target negative inflammation processes without "turning off" critical functions.

CAUSES OF INFLAMMATION

There are many causes of inflammation, many of which have been linked to increased risk of AD. In some cases, these causes of inflammation can be avoided or addressed - sometimes with non-pharmaceutical interventions.



CAUSE	HOW TO AVOID/ADDRESS
<p>1 Moderate and severe traumatic brain injuries are obvious triggers of brain inflammation and have been linked to an increased risk of developing Alzheimer's disease or other types of dementia.</p>	<p>Wear a helmet or other protective gear when engaged in activities such as cycling, in-line skating, playing hockey. Always wear your seatbelt in the car and avoid falls by using handrails on stairs and using a cane or walker if you need one.</p>
<p>2 Certain foods can cause inflammation and may increase the risk of developing dementia, while other foods may be anti-inflammatory and possibly boost cognitive function.</p>	<p>Stay away from sugar, white flour products and processed foods. Some of the foods to embrace include leafy green vegetables, salmon and other cold-water fish, berries, extra virgin olive oil, and cold-pressed virgin coconut oil. For more about healthy eating for vibrant brain health, see the article "Millennials Have The Power To Prevent Their Own Cognitive Decline" or visit http://memorymorsels.org.</p>
<p>3 While the exact nature of the association is unclear, there are conclusive links between depression, inflammation and dementia. Chronic inflammatory changes are known to be a common feature of depression, and evidence shows that depression often precedes AD and may be an early sign of dementia.</p>	<p>Although there is not definitive proof at this point that treating depression will decrease dementia risk, some research raises hope that may be the case, so be sure to seek treatment for depressive symptoms as a potential preventive measure.</p>

OTHER POSSIBLE CAUSES

Two additional causes of inflammation currently being researched, with no specific response measurements, include viruses and air pollution.

Viruses such as Herpes Simplex Virus 1 (HSV-1) and HIV are known to affect the brain, causing inflammation and possibly contributing to increased risk of cognitive decline and dementia. Research to date on HSV-1 and Alzheimer's disease has revealed only a correlation between the two, meaning that links have been found but there is no proof of a causal relationship.

Some studies of older adults with active Herpes Simplex Virus 1 infections have shown those individuals are more likely to be diagnosed with Alzheimer's than those without an active HSV infection, but it is not known why this happens and it certainly is not to be interpreted as proof that HSV causes AD.

It's possible the correlative relationship is coincidental, or that there are other risk factors not-yet-discovered that explain the link.

HSV-1 is far more common than AD, so it's obvious that HSV-1 could only be one of many factors than increase risk. Some estimates indicate that 80 percent of the population in the United States has HSV-1.

Research suggests that tiny particles in **air pollution** also play a role in brain diseases. Studies have found that people who have been exposed to more air pollution, especially fine particles, are at increased risk for dementia and mild cognitive impairment.

The fine and ultrafine particles in air pollution are able to travel from our nostrils directly into our brains, and although the research is in the early stages, it appears that these particles in the brain may be kicking off or accelerating brain degeneration.

The presence of these small particles creates an inflammatory response in the brain; microglia are activated to deal with the invading particles. The toxins which are sometimes attached to particles can corrupt the microglia, putting them into a permanent attack mode, creating chronic inflammation. 🌐

MILLENNIALS HAVE THE POWER TO PREVENT THEIR OWN COGNITIVE DECLINE

It's Not Too Early to Start Taking Care of Your Brain



Many people think of dementia as a disease that affects seniors, and while it is true that diagnosis of dementia is most common in older adults, it is also true that the disease begins its long course of destruction in the brain decades before any symptoms are even noticed.

There is much we still don't know about dementia but the vast majority of cases are thought to be the result of complex interactions among multiple factors. Some of the known risk factors such as age or genetics cannot be changed, but research to date suggests that other factors can often be modified to decrease risk.

Most of the modifiable risk factors are those consistent with a healthy lifestyle and, given the lengthy time span over which dementia develops, the sooner you get started making healthy choices, the better.

Accordingly, millennials should take note - there is much you can and should be doing now to help keep your brain healthy.

DON'T WAIT UNTIL YOU'RE OLDER TO TAKE ACTION, WHEN DAMAGE MIGHT ALREADY BE WELL UNDERWAY.

BE PROACTIVE EARLY TO PREVENT COGNITIVE DECLINE AND DEMENTIA

Get Regular Physical Activity

The strong relationship between physical activity and cognitive performance has been well established through more than 30 years of research. Be sure to engage regularly in cardiovascular exercise that elevates your heart rate so that you get your blood flowing such as running, spinning, and swimming.

Include some weight or resistance training since a combination of aerobic exercise and strength training is best for your body and brain. Incorporating activities that develop balance and coordination - such as yoga, Pilates, tai chi, or simply workouts with balance balls - can help you avoid falls as you get older (thus avoiding head injuries that are associated with an increased risk of dementia).

Manage Vascular Risk Factors

Address any vascular risk factors you have, with help from your doctor if necessary. It just makes sense - and research confirms - that anything that negatively impacts circulation through your blood vessels will affect your brain. Although your brain is only about 2 percent of your total body weight, it gets 15 to 20 percent of your body's blood supply. Clearly, the reliable and steady flow of blood to your brain is critical for optimal functioning.

Specifically:



If you smoke, stop. Smokers are twice as likely to develop dementia than non-smokers. When you stop smoking, your brain experiences improved circulation almost immediately, regardless of your age.



Maintain a healthy body weight. People who are overweight or obese have increased risk of dementia.



If you have diabetes or hypertension, follow any diet/exercise advice from your doctor to manage your condition through a healthy lifestyle, and if those efforts are not sufficient, then take any medication(s) prescribed to ensure your condition is managed.

Eat a Healthy Diet

Research to date suggests that food that is good for your heart is also good for your brain, so follow these broad, heart-healthy eating principles: (1) eat lots of vegetables, fruits and whole grains; and (2) limit your intake of sugar and saturated fats. The Alzheimer's Association describes two specific diets that have been studied and found to be potentially beneficial, the DASH (Dietary Approaches to Stop Hypertension) diet and the Mediterranean diet (although they are careful to note that "no one diet is best").

DASH emphasizes vegetables, fruits and fat-free or low-fat dairy products; includes whole grains, fish, poultry, beans, seeds, nuts, and vegetable oils; and limits sodium, sweets, sugary beverages, and red meats while a Mediterranean diet includes relatively little red meat and emphasizes whole grains, fruits and vegetables, fish and shellfish, and nuts, olive oil and other healthy fats.

Participate in Mentally and Socially Stimulating Activities

Multiple studies suggest that staying mentally active and having strong social connections may lower the risk of cognitive decline and Alzheimer's disease. Implementing this brain-healthy strategy should be fun! You could find a new hobby, learn to play a musical instrument, learn a new language, join a professional networking group and/or book club discussion, go out with friends, or host a dinner party. The options are endless, so you should easily be able to find something appealing to do in your spare time that engages you mentally and socially.

Manage Your Stress

Chronic or severe stress is known to have a negative impact on the brain - increasing your risk of dementia, in part because of the resulting shrinkage of your hippocampus (a key part of the brain for memory). **Different strategies work for different people when it comes to stress reduction.** For many people it will involve >>



IMPACT OF MODIFIABLE RISK FACTORS ON DEMENTIA

One study estimates that up to half of Alzheimer's disease (AD) cases worldwide are potentially attributable to seven modifiable risk factors (diabetes, midlife hypertension, midlife obesity, smoking, depression, cognitive inactivity or low educational attainment, and physical inactivity). The authors of "The projected effect of risk factor reduction on Alzheimer's disease prevalence" in *The Lancet Neurology*, September 2011, predict that a 10% to 25% reduction in all seven factors could potentially prevent up to three million AD cases worldwide.

UK research "Lifestyle linked to changes in brain ageing" published by *Age UK* on December 15, 2014 revealed that about 75% of cognitive decline can be accounted for by lifestyle and other environmental factors such as level of education. The lifestyle factors that they found decreased the risk of dementia included regular physical exercise, eating a Mediterranean diet, not smoking, drinking alcohol in moderation, and preventing/treating diabetes, high blood pressure and obesity.

learning to say no to some things so that your "to do" list is realistic. For others, it may involve adding new activities that bring joy such as engaging in a creative pursuit or walking your dog in the woods, or perhaps new activities that relieve pent-up anger, anxiety or frustration such as going for a jog, writing in a journal, meditating, or taking a yoga class.

Everyone can benefit from incorporating some simple, quick stress-relieving tools into their day that provide immediate relief, such as simply pausing to focus on your breathing periodically throughout the day, practicing letting go when something fires you up, or taking a soothing bath before bed.

Millennials Motivated to Stay Healthy as They Age

With so much potential for prevention of dementia, it's great news that

MILLENNIALS SEEM LIKELY TO TAKE ADVANTAGE OF THE KNOWLEDGE THAT THEY CAN TAKE STEPS NECESSARY TO PROTECT THEIR BRAIN AS THEY AGE.

In 2014, the Nielsen and Natural Marketing Institute published a

research report titled "Millennials are Seeking the Fountain of Youth Through Healthy Aging." The report shares that millennials (18-36 years old, according to the definition they used for this research) "are taking personal interest in their health and are increasingly driving sales in health care categories."

Motivation to stay healthy is not just a trend with millennials. The same study also examined the attitudes of all adults (18+ years) and found that 75 percent of all American adults say "they are taking more personal responsibility for their health today compared to 10 years ago, so as not to have to rely on others later in life."

It's Never too Late to Take Action for Your Brain Health

While this article is intended to specifically urge millennials to be proactive about their brain health early, it is important to emphasize that it's never too late to begin making healthy lifestyle choices to potentially prevent or delay cognitive decline (so older people should heed the lifestyle advice as well!).

And, with "multi-factoral" conditions such as dementia, "a small reduction in multiple risk factors can substantially decrease overall risk," according to Alina Solomon et al. in their article "Advances in the prevention of Alzheimer's disease and dementia" published in March 2014 in the *Journal of Internal Medicine*. Be sure to address all of the risk factors that apply to you, whatever your age, so that you maximize the impact of your efforts. 🌱



MENOPAUSE & MEMORY

Cognitive Changes
Can Occur

It is normal for women in their forties and early fifties to notice short-term memory loss becoming an issue. Once you spot the symptom, it's easy to jump to conclusions about memory-impairment diseases, such as dementia, but the majority of menopausal women facing short-term memory loss are actually experiencing "brain fogs". Common during perimenopause, brain fogs affect a woman's ability to concentrate, adapt to routine, and absorb, process, and retrieve information. Some memory lapses are caused by an imbalance of hormones, but may be minimized if certain measures are taken.

This led to a number of questions, so Women's Brain Health Initiative turned to Dr. Wendy Wolfman at Mt. Sinai Hospital in Toronto to find answers. >>

WOMEN'S BRAIN HEALTH INITIATIVE (WBHI): What is considered normal memory loss at normal, or non-surgically induced, menopause? And what is considered abnormal?

DR. WENDY WOLFMAN (WW): Women have an increased risk of Alzheimer's disease compared to men, which raises the possibility of estrogen depletion at menopause being a contributor.

Memory loss is a very subjective experience. Memory changes are a common complaint amongst our patients in the menopause clinic. There are many types of memory and different areas of the brain are involved. Many women report changes in memory around menopause, such as difficulty with name finding. Some of these memory lapses improve after the extreme in hormonal fluctuations resolve after the menopausal transition.

Normal memory changes would include forgetting where you have put your keys, or someone's name that isn't a close friend or family member. Abnormal changes might include getting lost in a familiar neighbourhood or forgetting your own birthdate. It is important to be respectful of memory changes in women and we feel that further evaluation is warranted in someone who notices persistent severe changes, for whom family members are concerned, or if the memory changes are associated with personality or mood changes.

WBHI: If imbalance of hormones is considered to be a major cause of cognitive function, what measures can be taken and which are most effective? Some physicians prescribe hormone replacement therapy (HRT), but in the early 2000's the Women's Health Initiative (WHI) study suggested HRT could cause heart disease or cancer, so many suspended the therapy. What is the current thinking?

WW: In the past, postmenopausal hormone therapy was prescribed to improve memory. A sub-study of WHI, the Women's Health Initiative Memory Study (WHIMS) surprisingly showed a worsening of minimal cognitive decline in women over the age of 65 who initiated hormone replacement therapy compared to women on placebo.

The WHI's findings pooled information for a mixed group of women ages 50-79.

MOST OF THE CARDIAC RISKS WERE ONLY SEEN IN WOMEN OVER THE AGE OF 70.

The risks for women on estrogen alone were different than women taking combination therapy to prevent uterine cancer because they still had their uterus. The current thinking is much more favourable for younger symptomatic women who have fewer risks and probably net benefit in taking hormone therapy. It is, howev-

er, an individual decision based on symptoms, benefits and risks. Currently, improved memory is not usually a symptom for which hormone therapy is indicated although individual women may notice improvement in certain areas of memory while on hormone replacement therapy.

Recent studies have also suggested that there are differences in the effects of estrogen if it is initiated around the time of menopause or many years later. Also a recent study did suggest less amyloid protein (associated with Alzheimer's disease) deposited in the brain in patients on transdermal estrogen around menopause, as measured by PET scanners. There is very promising research ongoing about hormonal effects on the specific aspects of memory.

In the case of women who experienced menopause as a direct result of surgery, studies have shown that loss of estrogen has been associated with cognitive decline, probably due to the acute change in hormone status. These studies have shown validated changes in memory for these women - specifically declines in visual memory in women who had their ovaries removed after 45 and semantic memory before age 45 compared to women with a natural menopause.

WBHI: What are your top tips for keeping brain healthy for post-menopausal women?

WW: It is up to each of us to develop life-style changes that will be beneficial to healthy aging.

- Loss of memory has been associated with multi-tasking and stress. Women are advised to avoid multi-tasking, avoid stress and get adequate sleep.
- Activities that enhance brain function such as reading, puzzle solving, and engagement in activities that require analytical thought are advised at all ages.
- A trial of hormone therapy especially for younger perimenopausal women may be helpful but doesn't work for all women. This needs to be discussed with your healthcare provider.

Eating well, sleeping well and keeping active both mentally, physically and socially seem like simple choices, and are always recommended. 🧠

Dr. Wendy Wolfman,
Director Menopause Unit, Mount Sinai Hospital,
Toronto and Professor, Department of Obstetrics
and Gynaecology, University of Toronto



EARLY DIAGNOSIS

Would you want to know?



If given the option of knowing or not knowing you are at risk for Alzheimer's, what would you choose? My answer: I'm not sure if I would. I'm an obsessive problem solver. Give me an issue and I'll come up with a barrage of solutions. But if there is no solution, no cure, do I really want to know?

I surveyed many of my friends about whether they would want to know if testing proved that they were at a higher risk for cognitive decline, and the overall consensus was - no - don't tell me. The common sentiment seemed to be what's the point of knowing, if nothing can be done?

It seems my friends are not alone. I recently had the good fortune to hear Dr. A.M.

THERE IS A VERY SPECIFIC DIFFERENCE BETWEEN TESTING AND SCREENING

Clarfield, MD, FRCPC deliver a talk titled "Screening for Cognitive Decline - A Double-edged Sword?"

Dr. Clarfield pointed out some very interesting issues. To start, there is a very specific difference between testing and screening.

Although the World Health Organization sets out a comprehensive matrix that defines the criteria for screening, in essence, if you have no complaints you are being screened for risk factors. If you

have symptoms, you are being tested as to whether you are already showing signs of the disease, how far the disease has progressed and you are receiving a diagnosis.

When it comes to cognition, there are problems with effective screening. For instance, since life expectancy is increasing, >>



if you exhibit risk factors you are then labeled as having the disease and all that appears to have been accomplished is increasing the length of time for which you 'have' an untreatable disease.

And once you've been diagnosed, it is difficult to ignore that you have IT! Along with IT, comes some thought-provoking issues.

What are the legal implications? Will an Alzheimer's diagnosis mean that you will not be able to obtain long-term disability or travel insurance?

Will it lead to depression? Begin a diagnostic spiral of anxiety? Result in labeling which in turn will make you ill?

How much time would it take our primary doctors, usually family practitioners, to deal with prevention? A US study estimated it would take 7.5 hours per day for doctors to deal with issues arising from these screening processes.

And of course, we would then have to be very cautious of the opportunity costs. What could we do with the money used for screening in this age of limited medical resources? How would we keep the disease promoters at bay - those who sell sickness and are ready to grow a market for those to sell and deliver treatments?

For those in favour of the screening/known question, the arguments include having time to plan, exercising one's right to know, preparing your children and loved ones, and, most importantly, contributing to research. For me, only the last point would be incentive to know.

IF I ALREADY HAD A POSITIVE DIAGNOSIS FOR COGNITIVE IMPAIRMENT, BEING PART OF A CLINICAL TRIAL THAT MIGHT HELP OTHERS WOULD MAKE ME FEEL THAT I WAS STILL USEFUL.


Clarfield shared the recommendations of a number of professional groups on the screening issue. The American Geriatrics Society and the Medicare Annual Wellness Visits, Department of Health and Human Services (US) advocated for evaluation and screening for cognitive ability and functional status.

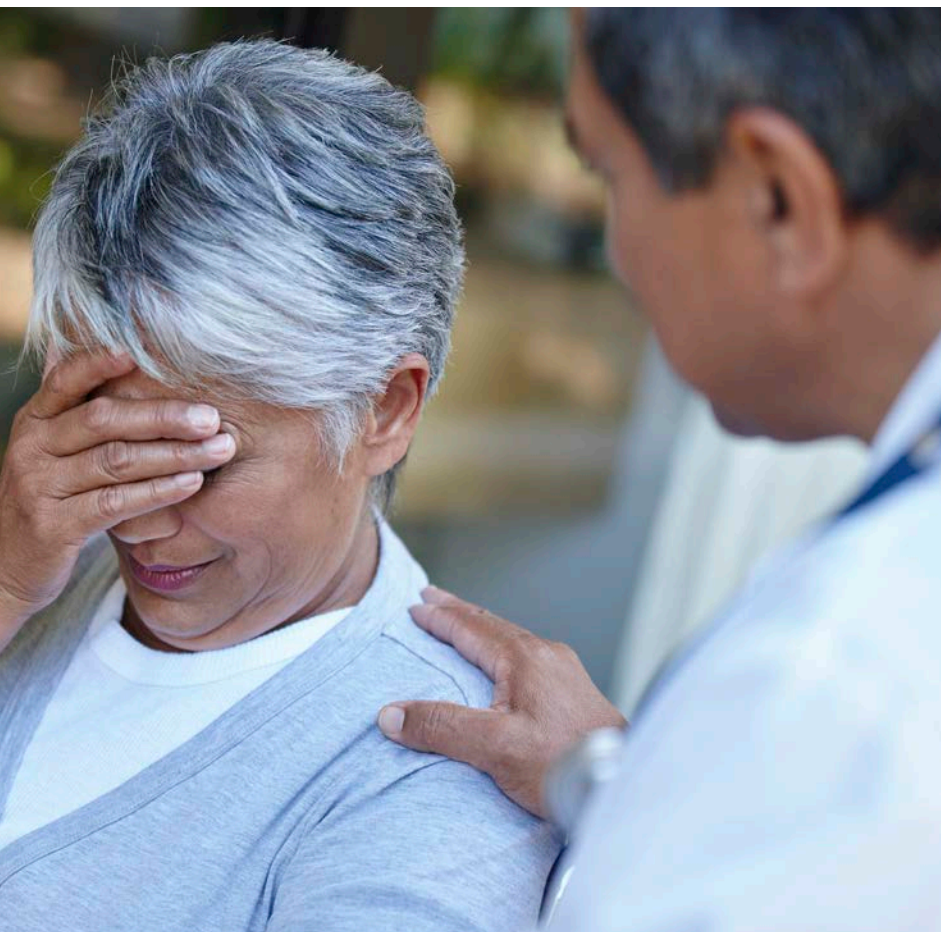
The American Academy of Neurology stated "insufficient data to make any recommendations regarding cognitive screening of asymptomatic individuals and sufficient data to recommend the

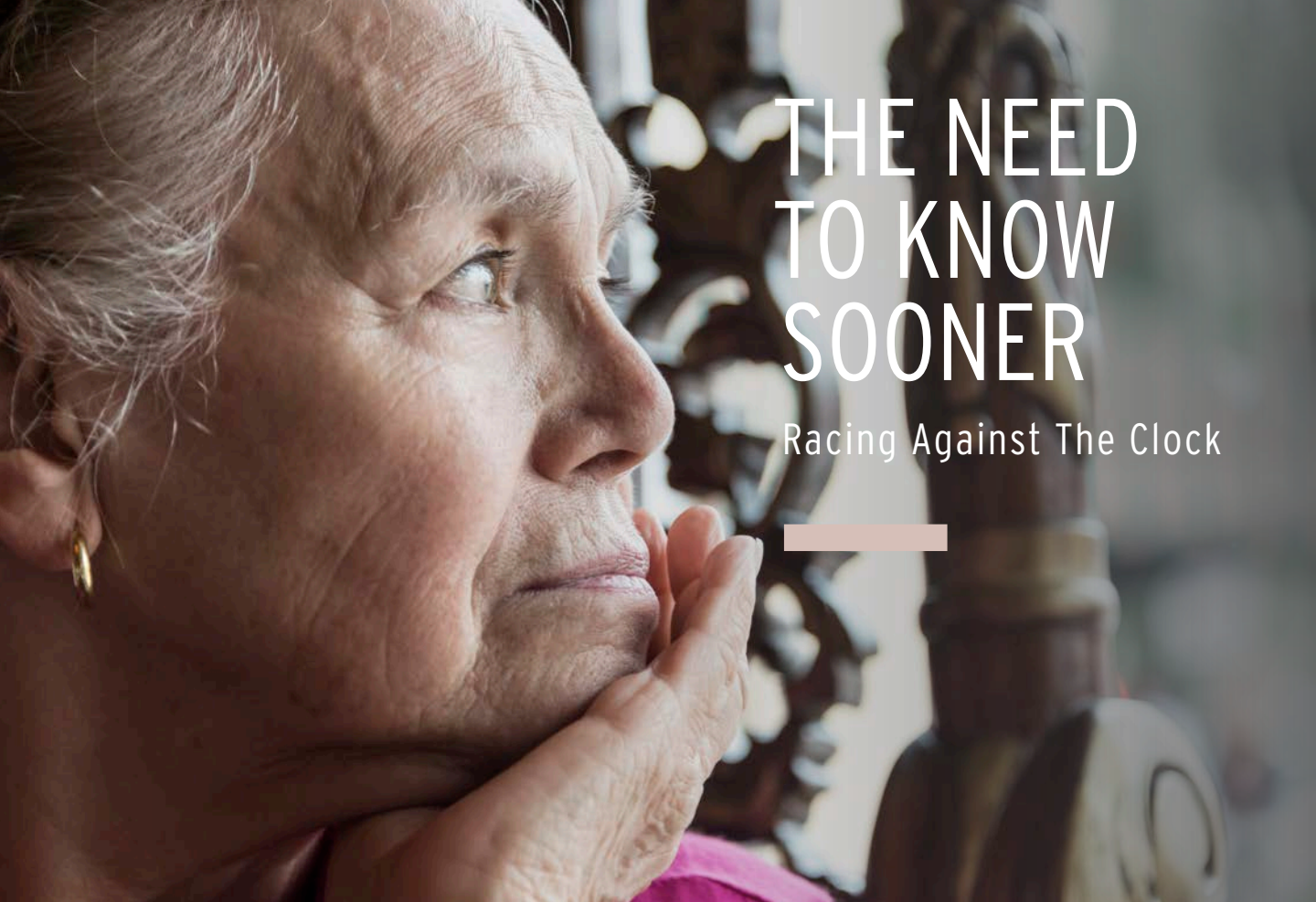
evaluation and clinical monitoring of a person with MCI due to their increased risk for developing dementia" (Peterson et al. Neurology 2001).

When surveyed about guidelines for screening, Canada, the US, Britain and Israel all agreed that there was insufficient evidence to proceed with screening programs for cognition and that prevention is more important than screening.

Clarfield concluded his presentation with the following: "All screening programmes do harm; some (can) do good as well" (J A Muir Gray, 1997).

That being said, it is quite likely that there will continue to be indecision out there when it comes to testing and screening and choosing to know and not know. My hope is that our increased efforts for research and prevention will pay off so that the fear of the unknown is resolved, and with that taken out of the equation, the question will become less relevant. 





THE NEED TO KNOW SOONER

Racing Against The Clock

Current diagnosis of Alzheimer's disease (AD) happens after symptoms of cognitive decline are evident, yet by that point in time brain damage is often already severe. The disease is known to develop over many years before symptoms appear, perhaps decades. Researchers have been seeking an easy, accurate method for detecting Alzheimer's disease before the symptoms surface, and before so much damage is done in the brain.

They are looking for biomarkers that indicate early stages of the disease. (A biomarker is a measurable substance that indicates the severity or presence of a disease, e.g., blood sugar levels are evaluated to determine if someone has diabetes.)

BIOLOGICAL MARKERS

Looking for changes in the brain, detectable with neuroimaging is one area of biological

marker research. Three molecular imaging tracers have been developed and approved that bind to amyloid beta (A β) plaques in the brain so that they can be seen during a positron emission tomography (PET) brain scan.

WHILE THE PRESENCE OF A β PLAQUES IN THE BRAIN IS A CHARACTERISTIC OF ALZHEIMER'S DISEASE, NOT ALL PEOPLE WITH SUCH PLAQUES HAVE OR EVER DEVELOP THE DISEASE.

So, these tests are not definitive on their own for reliably diagnosing or predicting Alzheimer's.

Other biomarkers being researched are levels of A β and tau--associated with Alzheimer's brain plaques and tangles--in cerebrospinal fluid (CSF), the clear liquid that cushions the brain and spinal cord. CSF

can be sampled via a spinal tap, or lumbar puncture.

These tests are not considered definitive on their own for diagnosing AD, and are currently used primarily in research settings.

Blood tests are also being studied for their potential to diagnose or predict risk of Alzheimer's disease.

No biomarkers for Alzheimer's disease have yet been validated, meaning that not enough research has been done at this point to say that any biomarker

accurately and reliably indicates the presence of Alzheimer's disease. The benefits of validated biomarkers will be significant for researchers who are working on developing treatments that target the disease earlier in its progression.

But, the discovery of validated biomarkers would open up the possibility of tests >>

that would let individuals know early that they are going to (or are likely to) get Alzheimer's disease, and that would result in challenging personal and ethical decisions.

TESTING

If a test existed that would tell you definitively you are going to get Alzheimer's disease in 20 years, would you want to know? What if it told you definitively 10 years in advance, or five years? While the answers to those questions are likely to vary from person to person, it is easier to weigh the pros and cons of the decision if the test results are 100% accurate. But in reality, that is not usually the case. More likely is that tests will be developed that will predict with some degree of accuracy less than 100% that you have a certain level of risk of getting Alzheimer's disease.

Now consider this hypothetical situation: if a test were available that could tell you if you are at high risk of developing Alzheimer's and that test was correct 97% of the time, would you want to take the test? In that scenario, the benefits of "knowing" are questionable because you actually don't

CURRENT PROCESS FOR ALZHEIMER'S DIAGNOSIS

Examination of brain tissue during an autopsy is currently the only way to definitively diagnose Alzheimer's disease. There is no single test that can be used to assess whether a living person has Alzheimer's disease. Doctors must use a variety of tools during an assessment, and they will be looking to rule out any other illness that might be causing the symptoms. According to the Alzheimer's Association, "experts estimate a skilled physician can diagnose Alzheimer's with more than 90 percent accuracy."

really know 100%, and the harms of "knowing" could be quite high, especially if you receive a false positive or a false negative result. Is it helpful to know you will probably get Alzheimer's, but might not? Most people would probably not find that information helpful and, so, would opt not to take such a test.

GIVEN THE UNCERTAINTY OF PREDICTIVE TESTING AND THE LACK OF A CURE OR LIMITED EFFECTIVENESS OF CURRENT TREATMENTS, WIDESPREAD SCREENING FOR ALZHEIMER'S DISEASE IS NOT RECOMMENDED.

Screening involves looking for signs of early disease or the presence of risk factors in healthy individuals, as is done in routine colonoscopies, for example. It is pre-symptomatic prediction, in particular, that has evoked strong criticism.

David Le Couteur, FRACP, PhD at the University of Sydney, Australia and his colleagues argue that screening for 'pre-dementia' or mild cognitive impairment (before symptoms are evident) will lead to over diagnosis and "have potential adverse consequences for individual patients, resource allocation, and research" (in their 2013 article "Political drive to screen for pre-dementia: not evidence based and ignores the harms of diagnosis" published in *BMJ*).

They go on to emphasize that over diagnosis of mild cognitive impairment needs to be avoided since "only 5-10% of people with mild cognitive impairment will progress to dementia each year, and as many as 40-70% of people do not progress or their cognitive function may even improve."

In the long-run, as testing methods are further developed and hopefully effective treatments or a cure are discovered, the ethical issues may shift around whether predictive testing and screening are a good idea or not. Of course, using predictive tests for research purposes, which is already happening now, is critical as it allows researchers to seek treatments that

would address the disease early. Screening for research purposes, to find study participants, is different than widespread screening in a clinical setting.

EARLY DIAGNOSIS

While widespread screening for Alzheimer's disease is not recommended, there is consensus that anyone who is experiencing worrisome cognitive changes should get assessed. In other words, there is consistent support in favour of being diagnosed as soon as possible. The Alzheimer's Society of Canada, for example, has a campaign (www.earlydiagnosis.ca) to raise awareness of the importance of getting diagnosed early, and the Alzheimer's Society in the UK runs the Right to Know campaign (<https://www.alzheimers.org.uk/righttoknow>) which advocates for early detection and support after diagnosis.

Once symptoms appear, there are obvious benefits to getting medically evaluated. Many treatable conditions cause dementia-like symptoms, and addressing those or ruling them out as early as you can is important. If you are diagnosed with Alzheimer's disease early, it provides an opportunity for you to play a role in planning for the changes ahead, while you have the mental capacity to make important decisions about your finances and long-term care. Other benefits of being diagnosed early include having an opportunity to make lifestyle changes that might delay the disease's progression, and perhaps participating in a clinical trial to help find a cure or treatment.

Even at this later stage, when the consensus is to seek a diagnosis if you are experiencing cognitive difficulties, there can be understandable resistance. Alzheimer's is a dreaded disease so, of course, many people are reluctant to see their doctors when they are experiencing problems with memory. But, not getting a diagnosis if you have the disease doesn't change the fact that you have it, and it robs you of a chance to make the most of the time you have left. 🌱

TRYING TO FIND THE CURE FOR ALZHEIMER'S

Why isn't there one yet?

There is growing evidence that it takes a decade or two for Alzheimer's disease (AD) to reveal itself - changes begin in the brain long before symptoms are evident. Historically, that meant that the disease was not diagnosed until late in the process, after symptoms became too noticeable to ignore or brush off as normal age-related cognitive decline.

Researchers focused on trying to treat mid-to late-stages of the disease because those were stages that could be identified, and there was urgent demand for an effective treatment given the devastating effects of the disease.

Several medication trials have failed to improve memory and other thinking skills in people with middle-to late-stage Alzheimer's disease, perhaps because the study participants' brains were already significantly and irreversibly damaged. Researchers thus began trying to intervene earlier in the disease process to see if Alzheimer's disease could be prevented or delayed.

There are clinical drug trials underway now with individuals who have either mild cognitive impairment (MCI) or early Alzheimer's disease and "these are important efforts," according to Dr. Reisa Sperling of Boston's Brigham and Women's Hospital and Harvard Medical School.

Dr. Sperling believes that, similar to cardiac disease and cancer treatment,

ALZHEIMER'S DISEASE IS PROBABLY OPTIMALLY TREATED BEFORE COGNITIVE IMPAIRMENT IS EVIDENT,

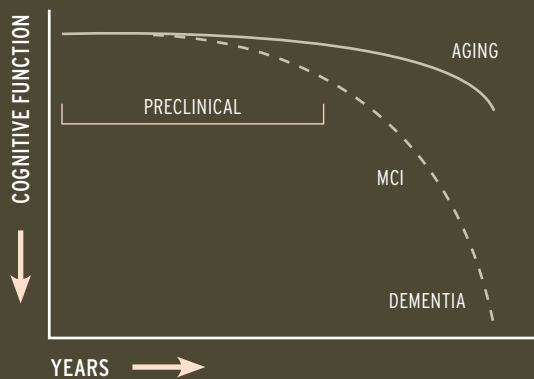
during what is referred to as the preclinical, or presymptomatic, stage. "While it's important to study all stages of the continuum of Alzheimer's disease," explained Dr. Sperling, "I am particularly excited that there has been a recent shift to conducting trials with people during the preclinical stage that precedes MCI."

Advances in brain imaging and genetics have allowed the expansion of research to include these prevention trials that target cognitively normal, but at-risk individuals.

A4 STUDY

Dr. Sperling is the Project Director for one of these innovative prevention trials, the A4 Study. This trial targets cognitively-normal people aged 65 to 85 years that have been screened for the presence of early amyloid-beta plaque (A β) build up in their brains. The presence of A β is a known hallmark of Alzheimer's disease so this trial is seeking a way to reduce or halt A β >>

THE CONTINUUM OF ALZHEIMER'S DISEASE



Alzheimer's disease (AD) progresses through a long continuum that looks like normal aging during the earliest part, as shown in the above image. During the preclinical stage, gradual changes are occurring in the brain but the individual is not yet experiencing any noticeable symptoms. MCI (mild cognitive impairment) comes next, followed by dementia, which itself is often classified in three sub-stages (early, middle and late). It is important to note that not everyone who experiences early changes in their brain structure goes on to develop MCI, and not everyone with MCI goes on to develop AD.

Source: "Toward defining the preclinical stages of Alzheimer's disease" in *Alzheimer's & Dementia*, May 2011

accumulation, hoping that will prevent cognitive decline.

A cure would be the ultimate discovery, but even if one isn't found, a treatment that delays onset would be monumental. Dr. Sperling explained that

"IF WE FOUND AN INTERVENTION THAT DELAYED THE ONSET OF ALZHEIMER'S BY FIVE YEARS, THAT WOULD RESULT IN A 57 PERCENT REDUCTION IN THE NUMBER OF PATIENTS WITH THE DISEASE."

Half of the participants in the A4 study receive a monthly IV infusion of the drug solanezumab for 3.25 years while the other half, the control group, receive a placebo (a harmless substance containing no medication). During the trial, participants will complete a variety of tests including ones that monitor any changes in their cognitive functioning.

The first participant began IV infusions two years ago, however the

project won't conclude until 3.25 years after the last participant begins. Enrollment in the trial will continue until they reach 1,150 participants. The study is being conducted at 67 sites, 65 of which are in Canada and the US, plus one in Australia and one in Japan. To learn more about this study or to participate, visit: <http://a4study.org/>.

GENERATIONS TRIAL

Another example of a prevention trial now underway is the Generations trial. This one targets people who are at high genetic risk for developing Alzheimer's disease based on testing for the AD risk gene APOE4. Butler Hospital in Providence, Rhode Island is one of the sites for this clinical trial, and Dr. Stephen Salloway heads the research team there. (Butler Hospital is one of the sites for the A4 trial as well.) Dr. Salloway explained, "The Generations trial will test two medications, an anti-amyloid vaccine and a beta secretase inhibitor, for their ability to delay the onset of memory loss."

Individuals with normal memory function, aged 55-75 years, can sign up at www.endalznw.org/genematch and receive a kit to perform a cheek swab at home and mail it back to test for the APOE gene. The researchers are looking for people with two copies of the APOE4 gene since that indicates a very high risk of developing Alzheimer's disease. It will be a particularly challenging task to identify suitable participants for this trial because as Dr. Salloway noted, "only approximately 2-3 percent of the population has two copies of the APOE4 gene." The researchers will therefore need to screen 100,000 people to find those at highest risk for the study.

GETTING INDIVIDUALS TO TAKE ACTION EARLY

In this publication the article "Millennials Have The Power To Prevent Their Own Cognitive Decline" on (page 14) WBHI emphasizes the importance of making lifestyle changes early to keep your brain healthy and try to prevent dementia, and in the article "The Need to Know Sooner" (page 21) WBHI discusses the widespread consensus about the importance of early diagnosis. Making healthy lifestyle choices to support your brain health and seeing your doctor immediately if you have any concerns about your cognitive functioning are both important ways that you can take action early to address



Alzheimer's risk. Yet another step you could take, to possibly help yourself and definitely help future generations, is to participate in a clinical trial. "Most participants in our studies decide to participate because they want to protect their children and grandchildren from having Alzheimer's disease," shared Dr. Salloway.

FINDING COGNITIVELY NORMAL, BUT AT-RISK PEOPLE TO PARTICIPATE IN CLINICAL TRIALS IS CHALLENGING AND YET IT IS CRITICAL FOR FINDING A CURE OR TREATMENT.

As Dr. Sperling described, "These people are out happily living their lives. They are not going to their doctor because they have no symptoms, so we have to reach out to these people in other ways." Articles like this one, TV interviews, social media and word of mouth can help raise awareness. "The good news is, once we reach people and raise awareness, we find there is a tremendous amount of interest in participating," said Dr. Sperling.

The two studies described above are only examples and there are many other trials that need participants. The Brain Health Registry (www.brainhealthregistry.org) is a website, led by researchers at the University of California San Francisco that is streamlining the process for getting involved with clinical trials while also helping

researchers analyze the brain function of thousands of volunteers over time.

After a simple sign-up process, volunteers provide a brief personal history and take online brain tests (which feel like online games). A select number of volunteers will be asked to do more, e.g., provide saliva or blood tests, or participate in clinical trials. Volunteers may choose to participate as little or as much as they like.

"ALZHEIMER'S DISEASE IS ONE OF THE TOP THREE PUBLIC HEALTH PROBLEMS THAT THREATEN THE STABILITY OF HEALTH CARE ECONOMIES AROUND THE WORLD,"

emphasized Dr. Salloway. "So it's no surprise that the US Congress and G-7 have made finding breakthrough treatments for Alzheimer's disease by 2025 a major priority." Alzheimer's is a devastating illness - for countries, communities, families and individuals. "There's nothing worse than the idea that the body is still healthy but the mind is slowly being lost over a decade or more," expressed Dr. Sperling. "We now have to take the fact that this is a long, slow disease and turn that to our advantage, targeting the earliest stage possible to try and prevent it. And I absolutely do believe that Alzheimer's disease is preventable." 🌐



WHEN SHE SAYS THAT'S NOT WHAT YOU SAID... IT'S NOT WHAT YOU SAID

While the underlying mechanisms that explain memory differences between men and women are largely unknown, the fact that there are differences remains an intriguing and insightful area of scientific study.

WOMEN HAVE THE UPPER HAND IN STORING
AND RECALLING VERBAL EPISODIC MEMORIES,

whereas men have the upper hand in storing and recalling visuo-spatial episodic memories.

Scientists have also discovered that women are very adept at remembering the faces of strangers and nearly anything associated with emotion, which may or may not be stored as episodic memory. Of course, what is important is not who has the best memory but how our memories work, the understanding of which

may help resolve the curious observation that the ways in which men and women remember information seem to compliment one another.

One reason why differences in memory formation exist between men and women can be attributed to hormones, primarily estrogen and androgens such as testosterone. Studies of people receiving hormone-based therapies have shed some light on the involvement of hormones in the formation and storage of memories. For example, estrogen replacement therapy in menopausal women improves long-term memory, and testosterone therapy in older men improves short-term memory.

According to a new study published in the March 16, 2016, online issue of *Neurology*[®], the medical journal of the American Academy of Neurology,

WOMEN MAY HAVE A BETTER MEMORY FOR WORDS THAN MEN

despite evidence of similar levels of shrinkage in areas of the brain that show the earliest signs of Alzheimer's disease (AD).

In the early stages of Alzheimer's disease, women may remember words more than men. This may delay diagnosis and treatment in women despite the same levels of shrinkage in brain areas linked to the debilitating disease .

These areas show the earliest evidence of the most common type of dementia. Alzheimer's disease is the 6th leading cause of death among Americans and an estimated two-thirds of people diagnosed with AD are women.

"One way to interpret the results is that because women have better verbal memory skills than men throughout life,

WOMEN HAVE A BUFFER OF PROTECTION AGAINST LOSS OF VERBAL MEMORY BEFORE THE EFFECTS OF ALZHEIMER'S DISEASE KICK IN,"

said Dr. Erin E. Sundermann from the Albert Einstein College of Medicine in New York.

In another recent study, researchers recruited participants who were part of the Alzheimer's Disease Neuroimaging Initiative. The participants included 235 people with AD, 694 with mild cognitive impairment including memory problems and 379 people without any thinking or memory problems.

The team of researchers measured both verbal memory and the size of the hippocampal area of the brain, the part responsible for verbal memory and is affected by the disease. They compared

these two factors and found that women performed better than men on the tests.

Verbal memory tests are used to diagnose patients with AD. These tests might fail in detecting mild cognitive impairment in women. When proper diagnosis is delayed, treatment is not initiated early enough in the disease.

This study sheds light on the need for individualized tests or a

SEPARATE MEMORY TEST FOR WOMEN SUSPECTED TO HAVE AD.

This will allow for early diagnosis and treatment among women, who are more affected by the disease. The study also showed that women showed greater evidence of shrinkage of the hippocampus.

In another study reported in the *American Journal of Geriatric Psychiatry*, a group of scientists set out to question if abnormalities in brain structure and function can occur several decades prior to the onset of cognitive decline. It is in the preceding decades that an intervention is most likely to be effective, when informed by an understanding of factors contributing to the early symptoms of Alzheimer's. In this paper, the researchers examined the timing and exposure of factors contributing to verbal memory performance in later life.

A total of 387 participants from the population-based Women's Healthy Ageing Project with a mean age at baseline of 49.6 (45 - 55) completed neuropsychiatric assessments and provided clinical information, physical measures and biomarkers as a baseline, and had at least three follow-up visits that included at least one cognitive reassessment.

Over the 20 years of the study follow up with these subjects, researchers found that mid-to-late life physical activity had the strongest effect on better later life verbal memory (0.136 [0.058, .214]). The next most likely contributors to verbal memory in late life were the negative effect of cumulative hypertension (-0.033 [-.047, -.018]) and the beneficial effect of HDL cholesterol (0.818 [0.042, 1.593]).

These findings suggest that

MIDLIFE INTERVENTIONS FOCUSED ON PHYSICAL ACTIVITY, HYPERTENSION CONTROL, AND ACHIEVING OPTIMAL LEVELS OF HDL CHOLESTEROL WILL HELP MAINTAIN LATER-LIFE VERBAL MEMORY SKILLS.

All three studies tell us the same thing - women do in fact, keep verbal memory longer than men. What we also learn is that it's not too late to make lifestyle changes that will enhance and protect our ability to keep those memories. 🌐

BEYOND MEMORY LOSS

Other Behavioural Changes Can Indicate Dementia

MILD BEHAVIORAL IMPAIRMENT CHECKLIST (MBI-C)

DATE: _____

LOCATION: CLINIC RESEARCH

RATED BY: CLINICIAN INFORMANT SUBJECT

Circle "YES" **ONLY** if the behavior has been present for at least **6 MONTHS** (continuously, or on and off) and is a **CHANGE** from her/his longstanding pattern of behavior. Otherwise, circle "No".

Please rate severity: 1 = MILD (noticeable, but not a significant change); **2 = MODERATE** (significant, but not a dramatic change); **3 = SEVERE** (very marked or prominent, a dramatic change). If more than 1 item in a question, rate the most severe.

Memory loss, a hallmark sign of dementia, is only one of the early symptoms of the disease, yet is often the sole focus of attention. Other out-of-character behaviours such as anxiety, confusion, disorientation, social withdrawal and inappropriate conduct can be more common, and in particular upsetting and noticeable to family members.

Researchers suggest if these other behaviours continue periodically for at least six months or more, they may be an indication of Mild Behavioural Impairment (MBI), a new clinical stage in the disease. This condition or patient status may be a forerunner of Mild Cognitive Impairment (MCI), the disorder that precedes dementia.

According to Dr. Zahinoor Ismail, of the University of Calgary's Hotchkiss Brain Institute, when it comes to older adults with mild cognitive impairment, about 13 percent progress to dementia each year. If they also have mild behavioural impairment, that rate increases to 25 percent per year.

The proposed checklist, MBI-C, designed under the auspices of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), is divided into five categories, addresses a younger, pre-dementia population and can be easily administered by physicians.

Though the checklist is preliminary, the results may be a red flag.

	YES	NO	SEVERITY		
This domain describes interest, motivation, and drive					
Has the person lost interest in friends, family, or home activities?	YES	NO	1	2	3
Does the person lack curiosity in topics that would usually have attracted her/his interest?	YES	NO	1	2	3
Has the person become less spontaneous and active - for example, is she/he less likely to initiate or maintain conversation?	YES	NO	1	2	3
Has the person lost the motivation to act on their obligations or interests?	YES	NO	1	2	3
Is the person less affectionate and/or lacking in emotions when compared to her/his usual self?	YES	NO	1	2	3
Does she/he no longer care about anything?	YES	NO	1	2	3
This domain describes mood or anxiety symptoms					
Has the person developed sadness or appear to be in low spirits? Does she/he have episodes of tearfulness?	YES	NO	1	2	3
Has the person become less able to experience pleasure?	YES	NO	1	2	3
Has the person become discouraged about their future or feel that she/he is a failure?	YES	NO	1	2	3
Does the person view herself/himself as a burden to family?	YES	NO	1	2	3

Has the person become more anxious or worried about things that are routine (e.g. events, visits, etc.)?	YES NO	1 2 3
Does the person feel very tense, having developed an inability to relax, or shakiness, or symptoms of panic?	YES NO	1 2 3
This domain describes the ability to delay gratification and control behavior, impulses, oral intake and/or changes in reward		
Has the person become agitated, aggressive, irritable, or temperamental?	YES NO	1 2 3
Has she/he become unreasonably or uncharacteristically argumentative?	YES NO	1 2 3
Has the person become more impulsive, seeming to act without considering things?	YES NO	1 2 3
Does the person display sexually disinhibited or intrusive behaviour, such as touching (themselves/others), hugging, groping, etc., in a manner that is out of character or may cause offence?	YES NO	1 2 3
Has the person become more easily frustrated or impatient? Does she/he have troubles coping with delays, or waiting for events or for their turn?	YES NO	1 2 3
Does the person display a new recklessness or lack of judgement when driving (e.g. speeding, erratic swerving, abrupt lane changes, etc.)?	YES NO	1 2 3
Has the person become more stubborn or rigid, i.e., uncharacteristically insistent on having their way, or unwilling/unable to see/hear other views?	YES NO	1 2 3
Is there a change in eating behaviors (e.g., overeating, cramming the mouth, insistent on eating only specific foods, or eating the food in exactly the same order)?	YES NO	1 2 3
Does the person no longer find food tasteful or enjoyable? Are they eating less?	YES NO	1 2 3
Does the person hoard objects when she/he did not do so before?	YES NO	1 2 3
Has the person developed simple repetitive behaviors or compulsions?	YES NO	1 2 3
Has the person recently developed trouble regulating smoking, alcohol, drug intake or gambling, or started shoplifting?	YES NO	1 2 3
This domain describes following societal norms and having social graces, tact, and empathy		
Has the person become less concerned about how her/his words or actions affect others? Has she/he become insensitive to others' feelings?	YES NO	1 2 3
Has the person started talking openly about very personal or private matters not usually discussed in public?	YES NO	1 2 3
Does the person say rude or crude things or make lewd sexual remarks that she/he would not have said before?	YES NO	1 2 3
Does the person seem to lack the social judgement she/he previously had about what to say or how to behave in public or private?	YES NO	1 2 3
Does the person now talk to strangers as if familiar, or intrude on their activities?	YES NO	1 2 3
This domain describes strongly held beliefs and sensory experiences		
Has the person developed beliefs that they are in danger, or that others are planning to harm them or steal their belongings?	YES NO	1 2 3
Has the person developed suspiciousness about the intentions or motives of other people?	YES NO	1 2 3
Does she/he have unrealistic beliefs about her/his power, wealth or skills?	YES NO	1 2 3
Does the person describe hearing voices or does she/he talk to imaginary people or "spirits"?	YES NO	1 2 3
Does the person report or complain about, or act as if seeing things (e.g. people, animals or insects) that are not there, i.e., that are imaginary to others?	YES NO	1 2 3

Based on the ISTAART-AA Research Diagnostic Criteria for Mild Behavioral Impairment © 2016
For more information contact Zahinoor Ismail MD email: MBIchecklist@gmail.com

MIRROR, MIRROR ON THE WALL. DO WE SEE OURSELVES AT ALL?

by Dr. Cori Lathan & Meryl Comer

Every time we go to the doctor's office, our height, weight, temperature, and blood pressure are meticulously checked and recorded. Those vital signs are important, but we seem to be missing the most important vital sign of all - our brain vital. One in four Americans suffers from conditions that affect brain function such as depression, post-traumatic stress, or Alzheimer's. And, all of us experience times when our brain is not operating at maximum efficiency.

These same observations apply when caregivers of loved ones with dementia look in the mirror. Over time we forget who we are and ignore early warning signs about our own brain health status. What if there was a "mobile mirror" we could access on our smart phones anytime/anywhere that: 1) objectively measures and feeds-back an early alert on our personal cognitive vitality; 2) links back to a research study that tracks and validates the impact of caregiving; and 3) turns our collective experience into research-worthy data to improve health outcomes and impact policy.

The Health-eBrain Study is a mind-meld of researchers in mobile health innovations, the non-profit, BrightFocus® Foundation, and the Geoffrey Beene Foundation Alzheimer's Initiative.

In 2015, more than 1,000 caregivers were recruited for Phase I of a study, which documented cognitive impairment in the informal caregiver population compared with non-caregiver controls. An informal caregiver is defined as an unpaid person without formal training, such as a family member, who provides care for an individual with dementia.


The Phase I study was designed to better understand factors responsible for cognitive decline among caregivers. It was found that the **CAREGIVER SAMPLE PERFORMED WORSE ON A NUMBER OF COGNITIVE TESTS RELATIVE TO NON-CAREGIVING, AGE-MATCHED, CONTROL PARTICIPANTS.** Further analyses revealed that factors such as stress, sleep, and years of caregiving seemed to play an important role in explaining caregivers' performance.

Phase II of the Health-eBrain Study, launched at the Global Alliance for Women's Brain Health Luncheon at the AAC in Toronto on July 26, 2016, explores caregiver stressors as possible causes for compromised cognitive vitality, and provides a pilot intervention that will support these caregivers with their mental health.

In Phase II, an international cohort of caregivers will use DANA, the U.S. Food and Drug Administration (FDA) cleared brain health assessment mobile app, to assess their cognitive function over 12 weeks. DANA provides detailed feedback about brain function that can be analyzed for changes over time. All participants in Phase II will use DANA, with some participants also using Mindoula, a virtual case management service. DANA will track their sleep, mood, stress levels and self-evaluation of memory. Participants receiving Mindoula will be those who show signs of depression and a high-level of caregiver burden. Mindoula connects users with a case manager who tracks their performance and provides resources to cope with the stressors of caregiving.

Using tools like DANA, regular screening for cognitive efficiency can track changes

in cognitive performance over time, and screen via objective tests for co-morbid conditions such as depression, insomnia, and fatigue. The Phase II objective is to evaluate the effectiveness of an intervention that combines virtual case management with a cognitive assessment app, through mobile digital health tools, in reducing depression and improving cognition among informal caregivers.

It doesn't matter if you identify as a caregiver, a family member, or care partner; we know who we are and what we do for our loved ones. But **NO DISEASE SHOULD BE ALLOWED TO TAKE DOWN THE HEALTHY CAREGIVER AS WELL.** Phase II of the Health-eBrain Study validates our collective experience and mirrors a personal reminder that our cognitive vitality matters too. Join us at: health-ebrainstudy.org 



Dr. Cori Lathan
CEO and Board Chair, AthroTronix, Inc.

Meryl Comer
President, Geoffrey Beene Foundation
Alzheimer's Initiative and Founding
Partner, 21st Century BrainTrust®



A FIRST FOR WOMEN'S BRAIN HEALTH

Our Grey Matter Matters



An exciting new research leadership position has been announced to develop knowledge on the subject of brain health for women. *The Wilfred and Joyce Posluns Research Chair in Women's Brain Health and Aging* will support an exceptional researcher working to enhance women's brain health through the study of cognitive aging and associated disorders.

If scientists can figure out the mechanism that causes women to experience diseases like Alzheimer's differently, then more effective treatments and a cure that meets women's needs specifically can be developed.

THIS INITIATIVE, THE FIRST OF ITS KIND, WILL BUILD CAPACITY IN RESEARCH THAT ACCOUNTS FOR GENDER AND SEX (BOTH SOCIAL AND BIOLOGICAL INFLUENCES) ON BRAIN HEALTH AND AGING FOR WOMEN.

The chair holder will work to translate the research results into gender and sex-sensitive policies and interventions that improve brain health and promote wellness in aging.

Lynn Posluns, founder and president of Women's Brain Health Initiative, is spearheading the initiative along with her siblings Wendy Posluns and David Posluns in the name of their parents, Wilfred and Joyce. Wilfred Posluns passed away in 2010 at the age of 78, and this Chair is being established to honour his and his wife's long-standing dedication to community involvement—something that Wilfred was very passionate about.

Sustained resources for the next 10 years will be provided to the chair holder in a unique partnership between the Posluns Family, the Canadian Institutes of Health Research (CIHR), the Ontario Brain Institute (OBI), and The Alzheimer Society of Canada (ASC).

According to Dr. Yves Joanette, Scientific Director, CIHR Institute of Aging, "It has become increasingly apparent in recent years that we need to account for sex and gender influences in health research. Men and women are similar in many ways, but when it comes to our health, our differences matter. By understanding these differences in brain health—such as why more women are affected by Alzheimer's than men, which cannot be accounted for by the greater longevity in women—we can work toward better treatments for everyone."

Dr. Tom Mikkelsen, President and Scientific Director, Ontario Brain Institute added, "We know that brain disorders can affect men and women differently with regards to how disorders present themselves and how they are experienced by an individual. The important work carried out by this new Chair will be poised for maximum impact."

To support the exciting research conducted by the new Chair, please contact Women's Brain Health Initiative at: 1-888-927-2011 or email info@womensbrainhealth.org.





(L-R) Meryl Comer (Geoffrey Beene Foundation Alzheimer's Initiative), Stacy Pagos Haller (BrightFocus Foundation), George Vradenburg (US Against Alzheimer's), Lynn Posluns (WBHI), Phyllis Barkman Ferrell (Elli Lilly)

Support for WBHI and women's brain health continues at events in Canada and the U.S.

GLOBAL ALLIANCE ON WOMEN'S BRAIN HEALTH LUNCHEON

(Above) July 2016

ROYAL BANK OF CANADA HOSTED DINNER FOR WBHI

(Below) July 2016

BRAIN BUZZ

WOMEN'S BRAIN HEALTH INITIATIVE ON THE MOVE



(L-R) Janice Fukakusa (RBC) , Hon. Michael Wilson (Barclays Capital), Lynn Posluns (WBHI)



Rachel Roy



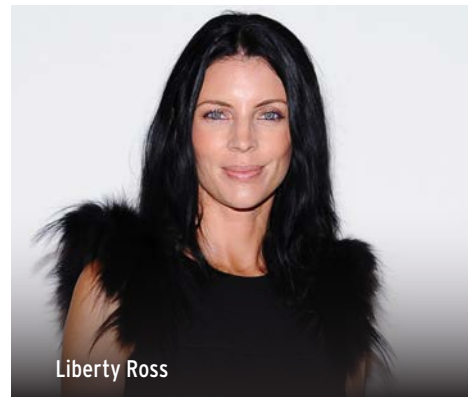
Molly Sims & Camilla Belle



(L-R) Alissa Vradenburg, Trish Vradenburg, Lynn Posluns, Anne Heche, Dr. Vivien Brown, Dr. Pauline Maki



Tracee Ellis Ross & Kelly Lynch



Liberty Ross

**WBHI WEST
COAST LAUNCH**
Los Angeles
October 2015



THE ADVANTAGES OF AN AGING BRAIN IN THE WORKFORCE

Timing is everything in life, isn't it?

In the summer of 2016, the American Presidential race dominated the world's media. Hillary Clinton and Donald Trump seemed to be the only topic of conversation in coffee rooms, twitter feeds, and news media. Much of this narrative was clearly divided: Republican versus Democrat, Public versus Private, North versus South, Male versus Female. Interestingly, however, for all of the rebuttals, issues, and challenges people may have with either candidate, there seemed to be a lack of commentary about their relative age in life, about their compared respective ages, or about how age might affect either of them as a candidate or as the President of the United States of America.

This got Women's Brain Health Initiative thinking: How do our brains age healthily, naturally? Does this differ between men and women over the life course? Especially in an era where both men and women work formally in the workforce into their retirement years, what does this mean for their careers or ability in the workforce?

Dr. Brynn Winegard thinks, writes, and speaks about the intersection of business and brain sciences toward professional and personal achievement. Formally trained in both business (MBA, PhD) and brain sciences (neuroscience, psychology), Dr. Winegard recently spoke to Women's Brain Health Initiative about the advantages of a healthy aging brain, how the brain ages in the workforce, as well as how this might differ between men and women in the workforce.

SOME FUNCTIONAL ADVANTAGES OF AN AGING BRAIN

When highlighting the advantages of an aging brain, Winegard notes that independent of gender, as we all get older, we get better at emotional intelligence (formally termed 'EQ'—emotional quotient—an homage to 'IQ') and interpersonal insight. While some systems may falter with age, our 'mirror neuron system' (MNS) actually becomes more acute as we get older, allowing us to better perceive what someone else might be thinking or feeling—an ability formally termed 'Theory of Mind' (effectively, that our 'theory' about what someone else's mind might be perceiving or thinking becomes more acute and more accurate). This ability allows us to better understand others' perspectives, to predict others' reactions, and to thoughtfully consider others' feelings or motivations in any given situation.

Further, because older brains have had a longer time on earth, with more experiences and cognitive learning to prove it, our brains get much better generally at long-term planning; at predicting cause and effect of most things; at being able to project longitudes; as well as seeing the 'big picture'. Wherever our personalities naturally started out in life,

WE ORGANICALLY GET BETTER AT BIG-PICTURE, LONG-TERM THINKING AS WE AGE.

Also, while aging itself brings with it some challenges, paradoxically we become more optimistic over our life course. This happens because negative memories decay in accessible memory first, and the brain uses an experimental process of evaluation about the outlook of the future by sampling its past—if the past seems to be 'rose-coloured' and well-lived, the human brain then uses this information to predict the future. The brain then (inaccurately) predicts that the future will look much like the (rose-coloured) past, and therefore the outlook is good. This is the route of all nostalgia: while the past wasn't better, that's how we remember it! In good news, however, this cognitive inaccuracy serves us well from a coping and mood perspective—wherever we started out on the optimist-pessimist scale in life,

WE BECOME MORE OPTIMISTIC AND OUR OUTLOOK IS USUALLY BRIGHTER AS WE GET OLDER.

All of this is interesting information about the healthy, aging human brain, but Women's Brain Health Initiative's question for today's work—and political—environment becomes: How does this translate on the job or in the workforce?

THE AGING BRAIN IN THE WORKFORCE: SOME OF WHAT WE GET BETTER AT

Firstly, Winegard explains, better EQ and a more acute MNS make us much better at predicting what direct reports, suppliers, workers, affiliates, partners, or employees are going to need, feel, say, or expect from us. This in turn helps us become more effective group members, managers, negotiators, arbitrators, mediators, and communicators.

Having more compassion, genuinely understanding multiple perspectives, and better insight into others' state of mind and thought processes makes us better at managing ourselves, others, and others' expectations, as well as communicating the right information the right way, which typically leads to better outcomes for everyone from a management perspective. **Older brains are typically better than their younger versions at the traits required to be good managers.**

Secondly, older, seasoned workers have developed a greater ability to predict longitudes, imagine cause and effect, and think 'big picture', and are therefore usually better at strategizing, long-term planning, managing, and leading others. While our younger counterparts tend to be more tactical, more technical, more experimental, more rote, and more innovative, we become better at knowing things tacitly (e.g. how to tie up a shoelace) and having cognitively accessible wisdom.

Overall, much of our cognitive 'executive functioning' (pardon the pun) housed in the prefrontal cortex of our brains, gets better as we age, and this typically leads to better outcomes for organizations from a leadership perspective. **Older brains are typically better than their younger versions at the traits required to be good leaders.**

Thirdly, our experience, decaying negative memories, and cognitive heuristics toward the positive allow our brains to become better at seeing the positives in life, in problems, and at work. The advantage of this from a management perspective is both that we make for more relaxed, more pleasant managers to deal with likely, but we are able to apply this optimism to problem-solving and solution-finding activities with greater ease than our younger selves or our younger counterparts would be able to—we aren't as burdened by stress associated with having to problem-solve.

From a cognitive perspective, our years of experience and expertise also allow us to generalize our problem-solving with greater ease, deal with ambiguity more readily, and transfer our skills and knowledge to other situations, contexts, or issues. Accordingly, the outlook combined with experience of an older brain typically leads to better outcomes for organizations from a counselling or consulting perspective. **Older brains are typically better than their younger versions at the traits required to be good counsellors or consultants.** >>

While this was all fascinating, Women's Brain Health Initiative was interested in how women and men might differ in terms of their healthy aging brains and what that might mean for their respective management styles, approaches, or relative advantages.

THE AGING BRAIN IN THE WORKFORCE: SOME GENDER DIFFERENCES

Here, Winegard highlights, the plot thickens: women and men do age differently, mostly

for biological reasons (e.g. men are theoretically reproductive all their lives, whereas women are not), and this does have an effect on the respective abilities that we retain. The one challenge in the research Winegard highlights is the following: there's an idiom in social research that holds that there's typically as much variation within a population (say all aging women) as there is between any two populations (e.g. between aging men and women).

This often makes it hard to draw absolute conclusions from social research on the topic of gender-based differential aging. Nevertheless, women seem to maintain their linguistic ability more readily, while men typically remain more physically capable. While men typically age faster and die younger, women often suffer more chronic diseases but age less rapidly (something termed "The Grandmother Effect").

From a vocational perspective, it is interesting to note that as women age they become better at processing higher-order social interactions (due in part to that acute MNS and experienced emotional intelligence), and are typically more interested and better able than men to manage complex social situations—which helps them in

AS WOMEN AGE THEY BECOME BETTER AT PROCESSING HIGHER-ORDER SOCIAL INTERACTIONS, AND ARE TYPICALLY MORE INTERESTED AND BETTER ABLE THAN MEN TO MANAGE COMPLEX SOCIAL SITUATIONS

managing many people interacting, or in understanding and predicting group dynamics. This ability actually helps women be relatively better managers of groups or teams of people wherever they put themselves to work: at home, in associations, or in the workforce.

Interestingly, this isn't reflected in modern patriarchal, hierarchical organizations—there are typically more men leading most modern organizations. Further, as an example, while women do not remain procre-

ative all their lives, men do, which means men are as distracted by thoughts and imagery of sex at 80 as they would have been at say 50 or 60.

Now add to this the confound that as we age our mutual ability to ward off distraction, concentrate, or stay with a particular thought decreases, and we end up with an interesting premise: while both genders are more easily distracted and find it harder to concentrate, men are more naturally and intrinsically distracted than women, allowing that while most of the C-suite and leadership of modern organizations remains predominantly male, in fact older female brains might be more natural to be there—they are theoretically more interested in and better at formally managing and leading groups of people, as well as less naturally distracted.

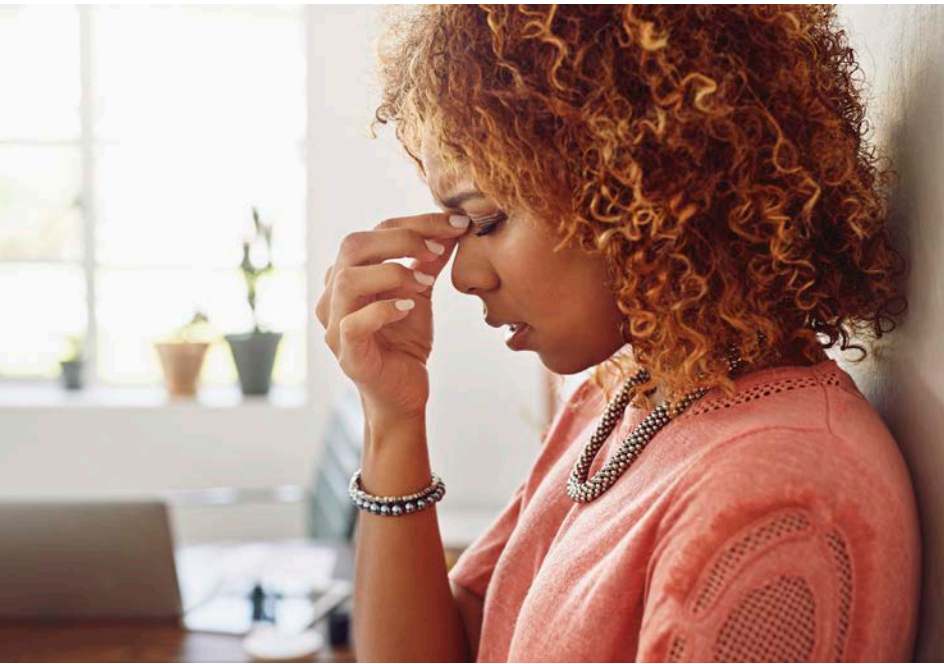
While definitive conclusions about gender-based differences are hard to draw, we here at Women's Brain Health Initiative can take solace in knowing that the healthy, aging, female brain certainly has a valuable place in society and in the workforce: they remain at least as relevant and able as men in the workforce.

What the proper research and proof of this could do for the composition of organizations in the future remains to be seen, but it certainly could mean exciting things for females of all generations in and entering the workforce.

And, what does all of this mean for Hillary versus Donald? At least we can discern that when it comes to the science of the aging brain, Hillary is at least as capable, predisposed, and skilled as The Donald ever could be. 🌐

Dr. Brynn Winegard
Business-Brain
Expert & Speaker
Winegard & Company

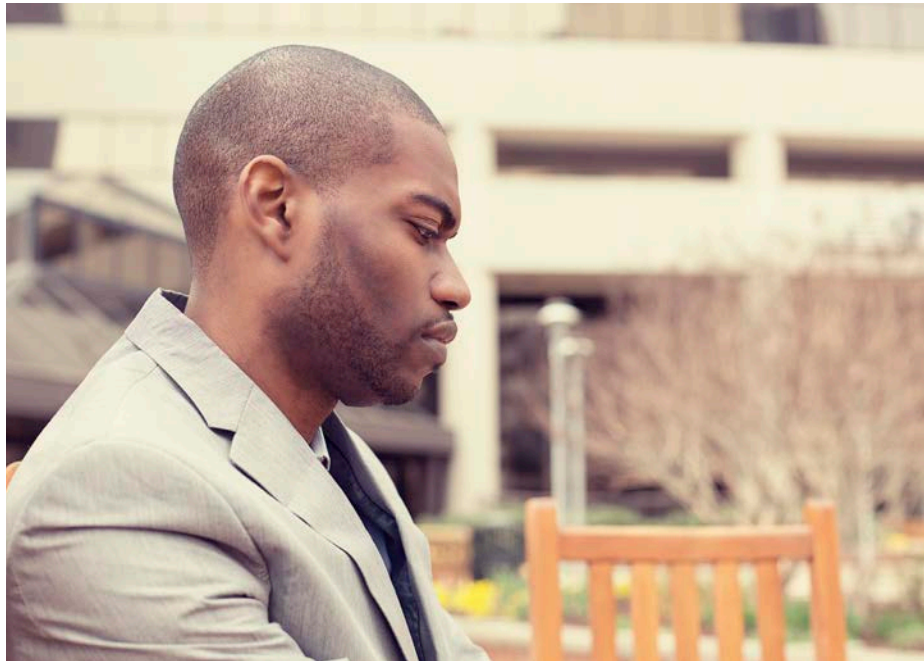




HER STRESS VS.

HIS STRESS

Women React
Differently Than
Men to Pressure



Chronic stress is linked to a wide-range of health problems including heart disease, depression, anxiety, and even dementia. Stress induces hormonal changes that when experienced for a prolonged period, result in increased blood pressure, higher blood sugar levels and a compromised immune system, creating the conditions for developing serious ailments.

Certain stress-related illnesses, such as depression, anxiety and dementia, are more common in women. In an attempt to uncover why that is the case, researchers are investigating the differences between women and men when it comes to stress. Stress is inherently challenging to study because it is perceived differently by each individual and there are numerous environmental, cultural and biological variables involved. And, teasing out >>

STRESS & DEMENTIA

Many studies point to a link between stress and dementia. Below are two recent examples:

A scientific study, led by the Rotman Research Institute at Baycrest Health Sciences in Toronto, and published in 2016, reviewed existing research and found that chronic anxiety and stress are associated with degeneration and impaired functioning of the hippocampus and prefrontal cortex, which may account for an increased risk of developing dementia.

A study by University of Florida Health researchers, described in a May 2015 *EMBO Journal* article, contributes to the evidence of a potential relationship between stress and Alzheimer's disease. It found that the release of the hormone corticotrophin releasing factor (CRF) boosts production of amyloid beta, the protein pieces that clump together into the plaques associated with Alzheimer's disease. Stress causes the release of CRF in the brain.

differences between the sexes when it comes to stress adds another layer of complexity. Research to date shows that "her stress" and "his stress" differ in several ways. Women and men differ in how much stress they report, how they perceive that stress, and how they cope with it. Here's a summary of what has been discovered so far about the stress differences between the sexes.

PSYCHOLOGICAL DIFFERENCES

Women report experiencing **higher stress levels** than men. The 2012 Stress in America survey by the American Psychological Association (APA) found that:

➤➤ On average, women reported their stress level to be 5.3 on a 10-point scale compared to the 4.6 men reported on average, with 1 meaning "little or no stress" and 10 representing "a great deal of stress." (A score of 3.6 was considered by both sexes as a healthy level of stress.)

➤➤ More women reported experiencing extreme stress; 23 percent of women reported a stress level of between 8 and 10 while only 16 percent of men did.

The same survey revealed that women are more likely than men to report **symptoms due to stress** such as fatigue (45 percent vs. 29 percent); feeling nervous or anxious (42 percent vs. 27 percent); feeling depressed or sad (39 percent vs. 28 percent); and having headaches (34 percent vs. 20 percent).

Other research supports the APA findings. For example, a study published in the journal *Personality and Individual Differences* in November 2004 reported that **"WOMEN SCORED SIGNIFICANTLY HIGHER THAN THE MEN IN CHRONIC STRESS AND MINOR DAILY STRESSORS"** as well as on physical symptoms. Interestingly, the study also revealed that while there was no difference between the sexes in the number of stressful life events experienced in the previous two years, the women "rated their life events as more negative and less controllable than the men" demonstrating that **women appear to perceive stress differently.**

It is important to note that it is not clear whether the higher levels of stress and symptoms reported by women are actual differences. Some researchers suggest it's possible that these differences may reflect a tendency by women to over-report stress or for men to under-report stress.

Research also suggests that **women and men differ in how they respond to stress.** In the 1930s, physiologist Walter Cannon argued that all humans and animals experience a universal physiological response to stress which he called "fight or flight." When faced with a stressful situation, the body's sympathetic nervous system responds automatically—increasing heart rate and blood pressure, quickening the breath—preparing one to "fight" the threat/stressor or flee from it (i.e. "run").

An article in *Psychological Review* in 2000 suggested that human females' response to stress is "not well characterized by fight-or-flight" but rather is more accurately described as a pattern they called "tend-and-befriend." The researchers suggested that because of women's traditional role as primary caregiver of any children, a uniquely female stress response evolved over time, one that maximized survival of self and offspring. With children to take care of, women were not able to fight or flee when faced by a threat, so they evolved to deal with stressors in a different way, tending to distressed children during periods of difficulty and befriending others to build a social support network that might provide protection during future exposure to threats/stressors.

BIOLOGICAL DIFFERENCES

Stress hormones are thought to be one of the main underlying causes of women's and men's differing reactions to stress, and perhaps of women's higher incidence of stress-related illness. Three hormones in particular play a crucial role in whether someone is inclined to tend-and-befriend or fight-or-flight: cortisol, epinephrine and oxytocin. For both women and men, stress increases cortisol and epinephrine levels, which raises blood pressure and circulating blood sugar (while cortisol alone compromises immune system function).

WOMEN'S AND MEN'S BRAINS BOTH RELEASE OXYTOCIN IN RESPONSE TO STRESS, BUT WOMEN'S BRAINS RELEASE MORE.

And, oxytocin is a substance known to alleviate pain and help one feel good about social interactions; it counteracts the effects of cortisol and epinephrine, and promotes nurturing and relaxing emotions, feelings that are consistent with a tend-and-befriend response to stress. Men, with their lower amounts of oxytocin, are more likely to exhibit the fight-or-flight response.

A study published in the October 6, 2010 issue of *NeuroReport* examined whether **brain differences** might be influencing women's tendency to seek out social support and men's tendency to withdraw in response to stress. Half of the women and half of the men participating were exposed to a stressor—placing their hands in nearly freezing water for up to three minutes, while the other half placed their hands in warm water.

Saliva tests measuring cortisol levels indicated that the men and women who had experienced the icy water were equally stressed by that experience, but brain scans using functional magnetic resonance imaging (fMRI) showed that the stress affected their brains in different ways. The stressed-out men and women were shown either neutral or angry faces while undergoing an fMRI scan; differences were noted in the fusiform facial area of the brain which helps with facial recognition. This area in the brains of the stressed-out men showed a decrease in activity, appearing to disengage, while this area in the stressed-out women's brains was on alert and more attuned to facial expression.

Sex hormones also play a role in sex differences in stress response. For example, estrogen is known to buffer the effects of stress, reducing the amount of cortisol released. Estrogen is produced by the ovaries in women until they reach menopause, after which estrogen levels drop dramatically. Men also have estrogen in their bodies; part of the testosterone produced by the testicles gets converted to estrogen. So, men continue to have estrogen—and enjoy its protective properties for their brains—throughout their

lives. This might help explain why more women than men experience brain diseases such as Alzheimer's after 50 years of age, because that is typically when women enter menopause and have low estrogen levels.

Much more research is needed to fully understand the sex differences when it comes to stress.

STRATEGIES TO DECREASE STRESS

Given the serious health consequences of chronic stress, both women and men need to seek out ways to deal with it. There are many ways both sexes can **cope with stress naturally** including learning to say no to some things, and engaging in meditation, yoga and other forms of physical activity, and creative pursuits. There are two habits that should also be addressed to reduce stress as well as the risk of depression and dementia: worrying and ruminating.

STOP WORRYING. Researchers at the University of Gothenburg in Sweden discovered that middle-aged women who tended to worry excessively had a higher risk of developing Alzheimer's disease later in life. The study, described in a 2014 *Neurology* article, followed 800 women for almost 40 years. A personality test was used to identify the women whose personalities tended toward the neurotic (i.e. were prone to worrying, anxiety, moodiness) and they were found to be twice as likely to develop Alzheimer's disease than the women who were least prone to neuroticism.

STOP RUMINATING. Rumination is a term used to describe the habit of mentally churning over and over thoughts about things that disturb or stress you out, rehashing past negative experiences or imagining future negative consequences. Research by Yale University professor Dr. Susan Nolen-Hoeksema found that ruminating is more common among women than men, and that people who have a tendency to ruminate are more likely to be depressed and at greater risk of developing other mental health disorders.

The lesson to be learned then is simple, for the health of your brain, practice staying focused on the present moment, letting go of the past, and not worrying about the future. It may not be easy to change these habits, but the payoff will be worth the effort. 🧠



SNORING – THE LONG TERM EFFECTS MAY KEEP YOU UP AT NIGHT



WHAT IS SLEEP APNEA?

Sleep apnea (AP-ne-ah) is a common disorder in which you have one or more pauses in your breathing or shallow breaths while you sleep.

Breathing pauses can last from a few seconds to minutes. They may occur 30 times or more an hour. Typically, normal breathing then starts again, sometimes with a loud snort or choking sound.

Sleep apnea usually is a chronic (ongoing) condition that disrupts your sleep. When your breathing pauses or becomes shallow, you'll often move out of deep sleep and into light sleep.

THE HEALTH RISKS

Obstructive sleep apnea may primarily be considered a "man's disease", but it poses serious and even life-threatening health risks for women who suffer it as well - particularly those women who live with the condition undiagnosed. Besides daytime sleepiness and issues with concentration, sleep apnea in women can cause an irregular heartbeat and high blood pressure in addition to other serious health problems like an increased chance of stroke.

ARE WOMEN AFFECTED IN THE SAME WAY AS MEN?

Research has shown that sleep apnea is quite common in older adults, affecting as many as 53 percent of men and 26 percent of women.

A 2013 study led by The University of California, Los Angeles (UCLA) suggests that women are less likely than men to be diagnosed with obstructive sleep apnea. The study also found evidence that

WOMEN WITH SLEEP APNEA ARE MORE PROFOUNDLY AFFECTED IN THE AREAS OF THE BRAIN THAT REGULATE MOOD AND DECISION-MAKING.

When it comes to obstructive sleep apnea, men and women often experience varying symptoms. While men often report symptoms such as snoring, waking up gasping for air or snorting, many women report symptoms like fatigue, anxiety and depression. Of course, some women also experience shortness of breath and snoring too, but, in many cases, the telltale signs of sleep apnea in females may not be as obvious.

The fact that men are twice as likely than women to be diagnosed with sleep apnea may be partially attributed to how women describe their symptoms. **Sleep apnea in women is commonly**

mistaken for depression, hypertension, hypochondria or other disorders.

IS THERE A CONNECTION BETWEEN DEMENTIA AND SLEEP APNEA?

Ricardo Osorio, MD, Research Assistant Professor of Psychiatry at NYU Center for Brain Health in New York, and his colleagues studied 2,000 people enrolled in the Alzheimer's Disease Neuroimaging Initiative (ADNI)—a population of 55 to 75 year olds, some of whom are cognitively normal, some who have mild cognitive impairment and others who have Alzheimer's dementia. Everyone was asked about their snoring or sleep apnea, and researchers followed up every six months for two to three years to record any changes in their cognitive status.

Those who reported having sleep apnea or snoring tended to develop signs of mild cognitive impairment, including memory lapses and slower speed on cognitive skills, about 12 years earlier on average than those who didn't report any sleep-disordered breathing. Mild cognitive impairment (MCI) often precedes Alzheimer's dementia, but not all people who develop MCI go on to get Alzheimer's. The connection between disrupted sleep breathing and MCI remained strong even after Osorio accounted for the effects of Alzheimer's -related genes, gender, education, depression and heart disease risk factors, all of which have been associated with increased risk of cognitive decline.

Osorio also saw a connection between sleep apnea or snoring and Alzheimer's dementia, but it wasn't as robust as the link to MCI. That might be because other studies have found that not only are sleep disorders a risk factor for Alzheimer's, but they are also a symptom of the degenerative brain disease—so those who already developed Alzheimer's disease may not have been accurately reporting their sleep habits.

In another study published in the journal *Neurology*, Dr. Andrew Varga, an instructor in medicine at the New York University Sleep Disorder Centre and study co-author, said "This study is adding to the emerging story that **sleep apnea may be contributing in some way to the acceleration of cognitive decline as you age.**"

Varga and his colleagues reviewed the medical histories of 2,470 people aged 55 to 90 who had participated in an earlier study designed to look for markers of Alzheimer's disease.

At the outset, study volunteers were categorized as being free of memory and thinking problems, or in the early stages of mild cognitive impairment, or with Alzheimer's disease.

The researchers found that sleep apnea was associated with a much quicker decline in cognitive function. But there was some good >>

news from the study:

TREATMENT FOR BREATHING PROBLEMS DURING SLEEP APPEARS TO BE PROTECTIVE, DELAYING THE ONSET OF MCI BY APPROXIMATELY 10 YEARS.

Patients with sleep apnea were, on average, diagnosed with mild cognitive impairment (MCI) nearly 10 years earlier than those who did not suffer from breathing problems during their slumber, according to New York University researchers.

The timespan for developing Alzheimer's also seemed to speed up. Those with sleep apnea were diagnosed, on average, five years sooner than sound sleepers, the authors reported.

"Essentially, this meant that people who got treated declined at the same speed as people who didn't have apnea at all," Varga said. The treatment can include machines that help people breath better as they sleep.

ARE THERE ANY OPTIONS?

Osorio is careful not to implicate all snoring as a precursor to memory problems or Alzheimer's. But particularly in the elderly, he says

doctors should consider the potential effect that disrupted breathing during sleep can have on the brain. While it's not clear how sleep disorders might be increasing the risk of MCI or Alzheimer's, it's possible that the cumulate effects of even the short periods when the person isn't breathing could deprive brain neurons of critical oxygen, and Alzheimer's has been linked to slower or abnormal blood flow caused by hypertension and high cholesterol levels.

Other studies have also shown that the protein associated with Alzheimer's, amyloid, tends to build up during the day when the nerves are active and decline at night during deep sleep. If people are being roused from deep sleep by their apnea or snoring, then they aren't enjoying prolonged periods of low amyloid production, so the substance can build up and potentially form plaques.

Osorio also found that it's possible to counteract some of the effects of sleep apnea. He also studied people who used a device to prevent apnea, known as a continuous positive airway pressure (CPAP) machine, which keeps airways open during sleep. Even though they snored or had sleep apnea, people who used the device developed MCI or Alzheimer's at the same rate as those who didn't have these sleep problems. CPAP machines are cumbersome and uncomfortable to use, and many people drop them after a few weeks. But, says Osorio, they may have more reason to stick with them now. "A lot of people don't use them because they see no benefits," he says, "but if they know it can improve their memory, they may definitely try to do better." 🧠



WHEN MOM IS DIFFICULT

Dementia May Cause Challenging Behaviour

Relationships between mothers and adult children can be challenging on the best of days, but when a mother gets dementia, that relationship can become downright difficult. In part, because of the well-known cognitive symptoms of dementia like memory lapses, repetition and confusion. But also because of additional symptoms of dementia that are quite common and even harder to handle, collectively referred to by health professionals as BPSD (behavioural and psychological symptoms of dementia). For someone with dementia, changes happening in the brain impact not just their cognition, but also their personality, behaviour, and emotions.

Imagine yourself as the adult caregiver in the real-life scenarios on the next page that illustrate a couple of the common behavioural and psychological symptoms of dementia. What would you do? >>



1. Mom is in the early to mid-stage of Alzheimer's disease and she still lives at home. Over time it becomes clear that she is no longer cleaning her house at all, despite having been quite fastidious before. The dust is thick on every surface, the bathroom is filthy and the carpet is covered with bits of food and cat hair. You explain to her that she needs some help with cleaning and offer to hire a cleaning person. She adamantly refuses, insisting that she is perfectly capable of cleaning her own house. She is so insistent that you drop the subject for that day, deciding you'll see if she does take any action on her own. When you return in a few days and the house looks the same, you bring up the need for a cleaning person again. Your mom proudly takes you into the kitchen to point out that she has dusted the top of the upper cabinets, explaining she did it all on her own, climbing up on a chair then the counter so that she could reach. She is convinced that this display of independence will convince you that she is right, she is perfectly capable of cleaning her own house and is doing a great job of it.

2. Mom is in the late stages of Alzheimer's and has to be taken to the hospital after a minor fall. As the two of you sit in the busy waiting room, she begins taking off her clothes. When you ask her to stop, she appears to not hear you so you start physically trying to prevent her from disrobing. This makes her angry and more determined to take it all off, and it turns into an escalating struggle, with your mother lashing out both physically and verbally (shouting and swearing).

Other examples of BPSD include: agitation, delusions and hallucinations, pacing, cursing, throwing things, speaking without a filter

(e.g., telling people their breath stinks), and other socially inappropriate behaviours, such as theft and public masturbation.

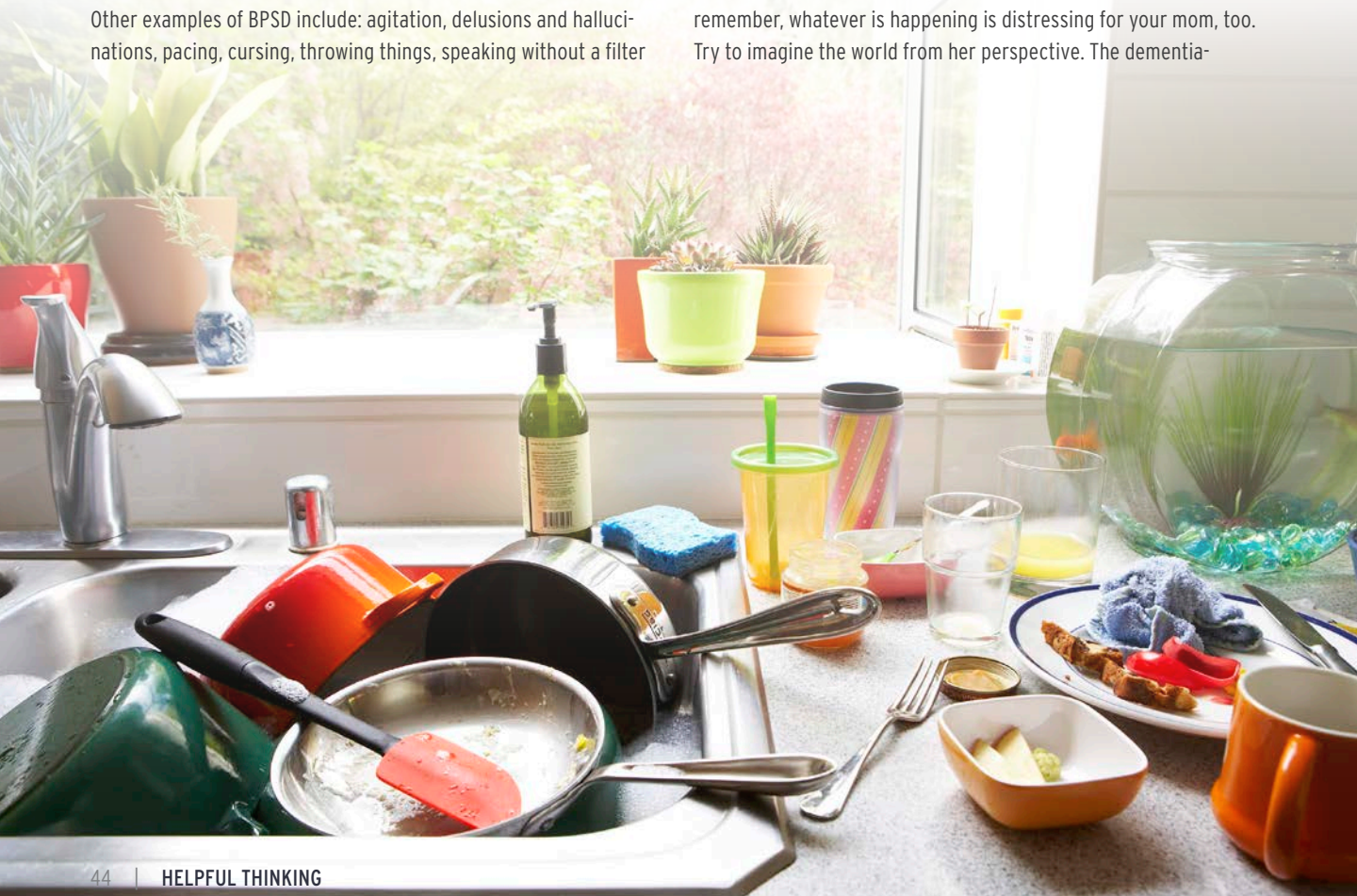
Historically, the behavioural and psychological symptoms of dementia were referred to as challenging, difficult, negative, excessive, disruptive, problematic, disturbing or inappropriate. While this negative terminology may accurately describe the behaviours from the caregiver's point of view, researchers and health professionals now prefer the term "responsive behaviours" which is a more neutral, person-centered term, emphasizing the fact that most of the behaviours occur in response to something, an unmet need or a trigger.

"Responsive behaviours can be the most challenging part of any type of dementia to deal with as a caregiver and can often lead to placement in a facility outside of the home," said Dr. Carol Ward, a geriatric psychiatrist with Acute Tertiary Mental Health, Interior Health Authority of BC and Clinical Assistant Professor at the University of British Columbia.

TIPS TO HELP YOU NAVIGATE CHALLENGING TIMES WITH SOMEONE WHO HAS DEMENTIA:

IMAGINE "WALKING A MILE IN HER SHOES"

Your mother's alarming behaviour may be stressing you out, but remember, whatever is happening is distressing for your mom, too. Try to imagine the world from her perspective. The dementia-



induced damage to her brain has changed her ability to make sense of the world around her. She is seeing and hearing things differently, interpreting things incorrectly, and having trouble communicating her needs. She is losing her sense of who she is as a person, is struggling to remember people and places she once knew, and is having difficulty with tasks that were once routine. She may even have anosognosia, a common consequence of dementia that leaves people unaware their functioning is compromised. Your mother may not even realize she is ill, so she's wondering why others keep telling her what to do. How would these experiences make you feel? Probably scared, confused, angry, and vulnerable.

Alzheimer's Research UK has developed an Android-exclusive app that, according to their website <http://awalkthroughdementia.org>, puts you "in the shoes of someone living with dementia." It depicts three everyday situations, using virtual reality, to help convey what everyday life can be like for a person with dementia.

Stopping to consider dementia from your mother's perspective will surely help you have more empathy, compassion, and patience.

DON'T TAKE HER BEHAVIOUR PERSONALLY

To help you deal with your mother's responsive behaviours, it is key to remind yourself that the effects of dementia are beyond her control. She is not deliberately being difficult or mean. As Dr. Ward put it, a person with dementia is "not intentionally being obstinate or trying to get your goat."

TRY TO DECODE HER NEEDS & UNCOVER HER TRIGGERS

See all the behaviours your mother displays as her best effort to communicate something. Consider it your job as a caregiver, with assistance from your mother's healthcare team, to decode the needs she is trying to express and

NOTICE WHAT SITUATIONS OR ENVIRONMENTS TRIGGER ANY RESPONSIVE BEHAVIOUR.

Is your mother in pain, dehydrated, or having trouble sleeping? Is she upset about being moved to a nursing home? Is she having trouble focusing in a cluttered or noisy environment? Is she forgetting how to do simple everyday activities like eat and get dressed? Is she resistant to receiving assistance with bathing?

Watch for patterns. Are certain times of the day more challenging than others? Do certain activities elicit regular resistance, e.g., bathing? Common triggers include too much sensory stimulation, being rushed, and being given too many instructions all at once.

VARIOUS RESEARCH STUDIES HAVE ESTIMATED THAT BETWEEN 50 AND 90 PERCENT OF PEOPLE WITH DEMENTIA, SUCH AS ALZHEIMER'S DISEASE, EXPERIENCE SOME SORT OF BEHAVIOURAL OR PSYCHOLOGICAL SYMPTOMS.

(<http://www.baycrest.org/educate/mental-health/behavioural-and-psychological-symptoms-of-dementia/what-is-bpsd/>)

There are many resources available online that can help you discern what your mother is trying to communicate, and explore what you can do to best help her. For example, The Alzheimer Society of Ontario offers an online tool, The U-First! Wheel, at <http://u-first.ca/why-u-first-2/u-first-wheel/>. This easy-to-use tool will help you learn about potential causes and triggers for BPSD and plan for optimal care based on understanding what's behind your mother's behaviours. It takes you through six areas that are part of the PIECES model (physical, intellectual, emotional, capabilities, environment, and social). There's even an app designed by University of New South Wales called BPSD Guide that can help you understand BPSD and suggest interventions that might help you in dealing with those symptoms.

DEVISE A CUSTOMIZED CARE PLAN

Once you've identified the underlying causes and triggers of your mother's responsive behaviours, you can experiment with different caregiving strategies until you uncover what works.

Dr. Ward shared an example of effective, customized care in response to a common trigger. She explained, "People with late Alzheimer's disease need regular help going to the bathroom but this type of intimate care is a common trigger. They do not understand or appreciate why someone is trying to help and so they resist or even get angry. Caregivers will use different strategies to help distract in the moment. Understanding each person is key because what works for one person may not work for the next. Some caregivers will sing a song they know the person likes, and even encourage the person to sing along during the task. Another successful technique is putting pictures in the bathroom that the person with dementia connects with, using them as tools to distract while care is being done." >>

In addition to techniques for distracting as described in the example, a care plan for addressing responsive behaviours might also include: creating a calm environment (e.g., by reducing noise, clutter and shadowy lighting, perhaps playing soft music and using soothing aromatherapy oils to scent the air), maintaining routines to provide predictable structure, allowing lots of time so the person doesn't feel rushed, reducing caffeine and sugar intake, placing dangerous objects out of reach, introducing activities to relieve boredom and increasing physical exercise.

Keep in mind that what works one day may not work the next. Your mother's symptoms and needs will change over time as the disease progresses, and so your caregiving strategies will need to evolve too.

FOCUS ON YOUR BEHAVIOUR

In a situation where everything might feel out of control, learn to focus on what is within your power to change: your own behaviour.

Check your attitude before interacting. Before entering the room or initiating an interaction, pause for a few deep breaths to slow yourself right down and get centered. Entering in a calm state of mind will help set a positive tone. Take your time and engage in some social interaction before getting right into administering any care activities.

How you communicate is key. Dr. Ward explains that **"the reaction you elicit from a person with dementia is heavily influenced by your facial expression, tone of voice and body language."** These are more important than the words you speak so be sure to smile, make eye contact and provide a reassuring touch to help get your message across while at the same time showing love and compassion.

According to the *Best Practice Guideline for Accommodating and*

Managing Behavioural and Psychological Symptoms of Dementia in Residential Care by BC's Ministry of Health, "verbal and non-verbal communication techniques such as speaking at eye level, approaching from the front and communicating in a clear, empathetic adult tone of voice have demonstrated effectiveness in preventing and managing some behaviours."

Don't argue about what's true. If your mom is saying things you know are false, consider just going along with it or asking questions to better understand her perspective. Resist the temptation to correct her or argue about what is actually true. Ask yourself, in the end, what does it really matter if mom doesn't remember what is actually true. If it won't hurt her, she doesn't need to be contradicted. Think of how accepting we are with young children's imaginative alternate views of the world, and how there is no harm in that.

Take a time out if you need to. If things are getting heated and you can't divert your Mom's attention to something else, back away or even step into another room (if it is safe to do so) to cool down.

LEARN TO LET GO

Before responding in any given situation, ask yourself if the behaviour is truly a problem. Dr. Ward suggests you, "stop, reflect and breathe. Think about safety, theirs and yours." Many behaviours may be embarrassing or uncomfortable to be around, but may not actually be hurting anyone, and in cases like that, learn to let things go. "Does it matter in the moment if the person with dementia goes into the bedroom and puts on three shirts and one is on backwards? Maybe not," continues Dr. Ward. Consider how to possibly anticipate and plan for the behaviour in the future (such as laying out clothes, limiting choices or access to clothing, in this example). Avoid intervening or correcting unless it is necessary to protect your loved one from harm. Allow the person with dementia to have as much choice and control as is safely possible. 🌱

FOCUS ON WHAT IS WITHIN YOUR POWER TO CHANGE: YOUR OWN BEHAVIOUR





CARING FOR A PARENT WITH DEMENTIA

What you can do to stay in the game

In The United States and Canada, about 16 million family members and friends are looking after people with dementia dedicating themselves to a staggering 18.5 billion hours of care.

If you happen to be one of these caregivers, you're probably not thinking much about the numbers. You're probably more focused on getting through today, this week, this month, this year. Here are some tips to help you navigate your "caregiving career." >>

Caring for a loved one with Alzheimer's disease or dementia is a risky business. While all types of caregiving come with a fair share of stress, numerous studies indicate that dementia care exacts a particularly high toll on its caregivers. Anxiety, depression, family conflict, chronic fatigue, and poor physical health are just a few of the adverse effects that commonly creep up on the family members who assume this role.

For adult children, the scenario is even more complex. They are more likely to be juggling caregiving with busy careers and families of their own. At the same time, many suffer from intense feelings of guilt over the inherent role reversal of Alzheimer's and their parent's progressive loss of independence.

On the plus side, caregiving can be an enriching experience. In Canada, 80% of a nationally representative sample identified positive aspects about caring for their family member with dementia. Benefits included giving back to a loved one, a sense of meaning, feeling needed, mastering new skills, strengthened relationships, and developing an appreciation for life.

Better news yet, positive feelings appear to buffer against depression and poor health. Here are a few additional points to consider, gleaned from research and experts in the field, to help make caregiving more rewarding and lessen the stress.

MAKE YOUR HEALTH THE ABSOLUTE FIRST PRIORITY

Family caregivers of people with dementia are often called the 'second patient in the making' – and for very good reason. Research consistently shows that they are at increased risk of serious problems such as lower immunity, chronic conditions (diabetes, arthritis, ulcers and anemia), cardiovascular problems, obesity, greater medication use, cognitive decline, and the list goes on and on.

In one study, a daughter caregiver described how she was so exhausted from working by day and caregiving by night that she fell asleep at the wheel and had an accident. In another case, a male caregiver sacrificed so much to care for his wife that he suffered a heart attack and a stroke from the strain. These may be anecdotes but they are supported by quantitative research.

**DEMENTIA CAREGIVERS
ARE PRONE TO NEGLECTING
THEIR OWN HEALTH.**

"Keep your health appointments – your mammogram, your physical. And exercise," says Dr. Laura Gitlin, Founding Director of the Centre for Innovative Care in Aging at John Hopkins University. "You're not taking time away from your parent. Staying healthy is an important part of your caregiving role."

WHAT A MALE PERSPECTIVE CAN TEACH YOU

When it comes to dementia care, women carry a heavier burden than their male counterparts, and not just because the majority of caregivers are female. Women face higher levels of depression, anxiety and role strain than men, and not surprisingly report a lower life satisfaction.

A possible reason for this gender difference is that male caregivers tend to take on the role of care manager rather than care provider. They believe their skills are best put to use on functions like managing finances, grocery shopping and medications, while assigning "softer" direct care tasks to family members and professionals.

Women, on the other hand, tend to take on the more stressful role of care provider. The sheer number of hours devoted to dementia care, with intensity of support growing over time, takes an inevitable toll. Care providers report having to give up pleasurable personal activities and restrict time with friends and family, leading to feelings of social isolation. Adult daughter caregivers in particular may be at risk of compassion fatigue.

Men may be better at preserving their own wellbeing in the face of dementia care. In a recent small-scale study, son caregivers reported that they knew caregiving might affect their health and so they put boundaries on the time devoted to caregiving and the types of care they provided. They also made a concerted effort to continue seeing friends and participating in leisure activities. By putting in place a network of care helpers, they were able to put their own needs on par.

CREATE AN EXTENDED FAMILY OF CARE

Dementia caregiving is not a one-person job. Too often the role falls disproportionately onto the shoulders of one person in the family, a spouse or one child, leaving them open to the emotional and physical health risks of caregiver burden.

Family meetings can help facilitate a fairer division of labour and create an environment of support.

**MORE THAN OTHER TYPES
OF CAREGIVING, DEMENTIA CARE
IS RIFE WITH FAMILY CONFLICT
AND THE PERCEPTION THAT OTHER
FAMILY MEMBERS ARE NOT
DOING THEIR SHARE.**

Honest discussions up front and on-going communication to adjust responsibilities as needs arise may help alleviate some of the tensions.

PSSST... CANADIANS, TAKE NOTE

Residents of Canada have access to several caregiver benefits and tax breaks. Federal compassionate care leave for a terminally ill loved one was extended in 2016 from six to 26 weeks. The government is looking at expanding the benefit to include family members with serious illness in the future, so keep your ear to the ground.

You can also take a protected unpaid leave of absence ranging from 8-12 weeks, depending on your province. In Nova Scotia, caregivers of low-income adults can get a \$400 per month benefit. Check with your provincial governments to see what might be available.

Come tax time, Canada also offers a caregiver tax break, which can be easily claimed on Line 315 of your tax return. A StatsCan survey showed that only 3% of people providing care to their parents were taking advantage of this tax credit. Contact the Canada Revenue Agency to confirm your eligibility.

at a higher proportion than non-dementia caregivers. Inflexible work arrangements and difficulty reconciling the caregiver role with employment have been shown to increase strain and depression.

It's worth a visit to your Human Resources department to check out what options they might offer. Flexible hours, working from home, compassionate leave, and employee assistance programs might help mitigate stress considerably.

EDUCATE YOURSELF, DE-STRESS AND GET SUPPORT

Caregivers should learn as much as they can about dementia after their parent's diagnosis. There is a tendency towards denial in the early stages, a feeling that "people are overstating things," or "it's not that bad." This is a disease that follows its own trajectory, in its own time. Knowing the types of things that can happen provides caregivers with context when changes do (sometimes suddenly) occur.

There is no sugar coating it:

CARING FOR A PARENT WITH DEMENTIA IS DIFFICULT, ESPECIALLY AS THE DISEASE MOVES INTO ITS ADVANCED STAGES.

Stress reduction techniques are critical and can be as simple as deep breathing, exercise, listening to music, or laughing out loud. One expert advises clients to think about the small things they do in a day for themselves, and then really focus on savouring those moments.

Finally, seek out support from the local Alzheimer's organization. They help people with all types of dementias, not just Alzheimer's. They will tailor assistance to your individual needs, include the parent you are caring for in programs, and be by your side for the long haul - best practices are shown to have a positive impact on caregiver wellbeing. 🧠

By spreading the love around, primary caregivers have a better chance at finding pockets of time to take a break for themselves. Whether it affords time for a 20-minute walk or an hour-long coffee date with a friend, this kind of social support improves psychological wellbeing and helps caregivers feel more positive about their role.

PREPARE YOURSELF FINANCIALLY

National economies owe a debt of gratitude to family caregivers, who annually contribute \$21.3 billion worth of unpaid care for people with dementia in the United States and enough hours in Canada to fill 227,760 full-time jobs.

Unfortunately this care, which enhances quality of life for elders and delays institutionalization, comes at a great financial cost to the caregivers themselves.

ADULT CHILDREN, WHO ARE MORE LIKELY TO BE EMPLOYED AND AT MID-CAREER, MAY BE PARTICULARLY HARD HIT.

Many will need to interrupt their careers to look after their parent. Early retirement, turning down a promotion, losing job benefits or giving up work entirely are realities that affect dementia caregivers



IS YOUR MOM BURNING OUT?

Caregiver Stress Takes its Toll



Caregivers often get so good at living with chronic stress that they don't know they are in trouble themselves until it's too late. If your mother (or father) is caring for an elderly parent with dementia (or you are), you may be at high risk for developing mental or physical health problems of your own. Here are some signs to recognize if a caregiver is burning out:

CAREGIVER SUPERHERO - She tries to do everything herself. When you ask if you can help, there is always some reason why she has to handle it herself. She's not giving herself a proper break.

BUGS ARE CATCHING UP - Colds, flus, illnesses that come more often and stick around too long, all are signs that the caregiver is getting run down. Caregiving is taking a toll on the immune system.

HAVE YOU HEARD FROM MOM? - It is too common for primary caregivers to lose touch with other family members and friends. Caregiving becomes an all-consuming task, leaving them feeling isolated.

JOYLESS GLASSES OF WINE - If you notice that your mom or other caregiver is drinking or smoking more than usual, or using drugs in a way not prescribed by their doctor, that's a sign that they are not coping well.

SHE'S JUST NOT HERSELF - As caregiver stress takes hold, a caregiver might have mood swings, furious one minute and despairing the next. Listen for expressions of overwhelm, anxiety or depression.

BRAIN FOG IS CREEPING IN - If a caregiver seems unfocused, can't concentrate and has difficulty problem solving, that's a sign that they are burning out.



WHAT YOU CAN DO...

"Have a family meeting," says Dr. Laura Gitlin, Founding Director of the Centre for Innovative Care in Aging at John Hopkins University in Baltimore, Maryland, "family caregivers have a hard time articulating what they need. Ask the caregiver to go through their daily routine and pinpoint what is most overwhelming, what can be taken away."

Divide up the caregiving duties to offer some respite. Community services and adult day programs can also alleviate some of the burden.

Dr. Gitlin also points out that young adults tend to have a different relationship with people with dementia. "They can really be with the person in the moment, more so than older caregivers who come with the history and knowledge of what the person used to be able to do, which is painful." Precious little time between grandparents and their grandchildren, listening to music or watching a show, is not only good for the family dynamic overall, it lets caregivers enjoy some worry-free time. 🌱

PRACTICAL TIPS FOR DEMENTIA CAREGIVING

1 Don't take it personally - When your mom or dad lashes out, gets stubborn or behaves erratically, understand that it's the disease talking. The mannerisms may be the ones you know from childhood, but your parent has no appreciation of how they are acting.

2 Step into your parent's shoes - For insights into puzzling behaviour, look at a situation through the eyes of your parent. One son politely knocked on his mother's door, making her so agitated that he had to leave. When he returned, he walked straight in without incident. He realized later that by knocking, she assumed he was a stranger.

3 Become a semi-professional sleuth - Questioning your parent about what they are doing or why can make them feel invaded. Instead, reduce the upset by sleuthing around. Piece together what is happening and simply look after it.

4 Find smart ways to meet their needs - Put supports into place in a way that won't upset your parent. For example, if you know in advance that your mother will be resistant to paying for a housekeeper, tell her it's a free trial or that you bought her a gift certificate as a treat.

5 Vent to a safe person - Remember Fred Flintstone screaming into a paper bag? Venting is healthy if it's aimed in the proper place. Write down your negative thoughts and expletives and throw them away. Jennifer McCallum, an Alzheimer Society First Link Coordinator, invites clients to vent via voicemail, which she then deletes. The important thing is not to hold it in.

Source: Jennifer McCallum & Tracy Koskamp Bergeron, Alzheimer Society of Dufferin County

TAKING ADVANTAGE

Seniors With Dementia More Vulnerable to Abuse



TERMINOLOGY: MISTREATMENT VS. ABUSE

The 2015 Canadian “Into the Light” study examined “mistreatment” of older adults, defining mistreatment as “actions and/or behaviours, or lack of actions and/or behaviours, that cause harm or risk of harm within a trusting relationship. Mistreatment includes abuse and neglect of older adults.” Other researchers simply use the term “abuse” to encompass neglect along with physical, psychological, financial and sexual abuse.

Many of the common effects of growing older, such as decreased mobility and strength, and diminished sight and hearing, leave seniors vulnerable to being abused, and this is especially true for elders with dementia. It is unknown exactly how many older adults are abused worldwide since it is a difficult subject to research. There are varied ways to define and measure elder abuse, and many of the abused are either reluctant or unable to disclose what they are experiencing, or may not even recognize it as abuse. A recent Canadian study, "Into the Light: National Survey on the Mistreatment of Older Canadians, 2015" found that 8.2 percent of older adults had experienced some form of mistreatment in the past year.

Research indicates that people with dementia have an increased risk of experiencing abuse, and the level of risk increases as dementia progresses. According to the US Department of Health & Human Services' National Center on Elder Abuse website, "Prevalence rates for abuse and neglect in people with dementia vary from study to study, ranging from 27.5% to 55%." With such incredibly high prevalence rates being found (rates that may underestimate the problem given the research challenges), elder abuse among dementia patients is clearly a massive public health and societal concern.

Elder abuse is any action that causes harm or distress to an older person. It can involve just a single incident or be a repeated pattern of behaviour. **THERE ARE MANY FORMS OF ELDER ABUSE: PHYSICAL, PSYCHOLOGICAL, FINANCIAL AND SEXUAL ABUSE, AS WELL AS NEGLECT.**

Most types of **physical abuse** are easy to recognize such as hitting, pushing and restraining, but physical abuse can also include the inappropriate use of anti-psychotic drugs.

Psychological abuse includes any behaviour that decreases a senior's sense of self worth and dignity, such as insults, threats, treating the senior like a child or socially isolating them.

Financial abuse includes improper use of the senior's money through coercion, theft or forgery. According to the Government of Canada's website for seniors, it can also include "unduly pressuring seniors to make or change a will," or "sharing an older person's home without paying a fair share of the expenses when requested."

Any type of sexual contact against someone's will is considered **sexual abuse**. This can include rape and inappropriate touching (over or underneath clothing).

When a caregiver does not provide the senior with the basic needs for survival, it is considered **neglect**. This includes not providing adequate nutrition, access to healthcare, or correct medication. For seniors with dementia, though, neglect can include simply leaving the person home alone since that can be dangerous.

Despite much media coverage of abuse at senior care facilities, the reality is that elder abuse is much more common at home, and

PERPETRATED MORE OFTEN BY FAMILY MEMBERS RATHER THAN BY PROFESSIONAL CAREGIVERS.

When seniors are abused by their loved ones, they are often reluctant to report the abuse because they feel shame or guilt, are afraid of being punished by their loved one or not being believed, are worried they will be put in a nursing home, or are apprehensive about involving the police or going through the court system. Sometimes they are not aware of their rights or of support systems that are available to help them. Most shocking, though, is that some seniors don't even realize that they are being abused; rather, they rationalize the behaviour in some way.

Dr. Lynn McDonald, a professor in the Faculty of Social Work at University of Toronto and principal investigator for the "Into the Light" survey, knows first-hand how often seniors will rationalize abuse. As part of a research project, older adults completed a measurement tool to assess whether they were being abused, checking off applicable experiences such as being hit or yelled at. Then participants were interviewed about their experiences, and it was surprising to discover the disconnect between what people reported on the measurement tool and what they would say. The tool would clearly indicate someone had experienced abuse but they would blow it off as if it wasn't abuse when asked about it. Dr. McDonald shared two examples of this disconnect:

1. "Someone checked off 'broken bones' on the abuse measurement tool but when asked verbally if they thought they were being physically abused, the person said, 'Oh no, I wasn't abused.' Further discussion revealed this person's rationale for what happened, 'Well, my daughter's always in a hurry and she's got to get me dressed before she goes to work. And you know, my bones are really thin, and she just snapped my wrist by mistake.'"

2. "One of the biggest areas of disconnect was also between what people checked off on the measurement tool and what they said involved psychological abuse. For example, someone would check off yelled at, intimidated, etc. but when asked if they felt they were being treated disrespectfully and abused, they would say, 'Oh, no. My son always yells at me. He's always scary, always saying he's going to put me in a nursing home if I don't do this or that.' These people didn't even realize they were experiencing abuse!"

Dr. McDonald continued, "It is outrageous that sometimes older people come to see themselves as so unimportant that it doesn't matter how much we hurt them. It tells us how much we need to >>>

educate, not just for younger people but for older people as well.”

SPOTTING THE SIGNS OF POTENTIAL ELDER ABUSE

Elder abuse can be hard to detect but watch for the following signs that may point to an elder being victimized or neglected:

- » mysterious physical injuries
- » unexplained credit card expenses or a sudden decrease in cash flow or financial assets
- » unexplained new legal documents, e.g. will
- » frequent arguments between the senior and a caregiver
- » a caregiver refusing to allow anyone else to be alone with the senior
- » weight loss or dehydration
- » poor hygiene
- » noticeable behavioural or personality changes, e.g. fear, anxiety, depression, passiveness
- » under or overdose of medication

Some of these warning signs can be the natural result of increasing frailty with age, and some overlap with the symptoms of dementia, making it challenging to confirm cases of abuse. It is especially challenging to confirm abuse of older adults with dementia since they may be unable to communicate what is happening to them, may forget the details or may be experiencing hallucinations that something is happening but isn't (e.g. delusions of sexual abuse can be one of the behavioural and psychological symptoms of dementia).

TAKING ACTION IF YOU SUSPECT ELDER ABUSE

If you notice any signs of potential elder abuse, it is important to take action. Speak directly to the elder, asking questions about what you have observed. Research support services for abuse in your community and offer to connect the elder with those services. In some cases the older adult may insist nothing is wrong; that may be true, but remember that

**IT IS COMMON FOR ELDER
NOT TO REPORT ABUSE OUT OF
FEAR OR SHAME.**

If you feel strongly that something is amiss and the elder refuses to

WHERE TO FIND HELP

Different communities will have different kinds of services available to help address elder abuse. The “What You Can Do to Keep Yourself Safe from Abuse” brochure that is part of the It's Not Right! campaign to address elder abuse in Canada (<http://itsnotright.ca/>) describes the types of services to look for, including:



PROVINCIAL/TERRITORIAL TELEPHONE NUMBERS

- » General information lines about community services
- » Senior abuse or family violence helplines. An example of a senior abuse helpline exists in Ontario, Canada. The Seniors Safety Line (1-866-299-1011) is a toll-free, confidential resource that provides information, referrals and support 24 hours a day, seven days a week
- » Legal services lines



DOMESTIC VIOLENCE SHELTERS/ELDER ABUSE SAFE ACCOMMODATION PROGRAMS



VICTIM SERVICES



HEALTH CARE PROVIDERS



MENTAL HEALTH PROGRAMS

Of course, in an emergency, you need to call 911 or the local police.

It's Not Right! was developed by The University of Western Ontario's Centre for Research & Education on Violence Against Women and Children.

seek help or if the elder is incapable of seeking help on her or his own, you can contact abuse support services to report your observations and they can investigate the matter further.

The Elder Abuse Ontario website reminds us that “everyone has a role to play to assist someone they suspect is being abused.” Don't assume that someone else will have already spoken to the elder about it or reported possible abuse. Don't be reluctant to get involved; the older adult with dementia may be in desperate need of your help. 🌐

THE ROAD LESS TRAVELED

The Impact of Dementia on Independent Mobility

A highlight of the teenage years for many people is getting a driver's licence. It represents freedom and independence. So, it's no surprise that the thought of losing one's licence - an inevitable reality for those with dementia - can be so distressing. Since driving cessation is such a sensitive topic, many caregivers are reluctant to bring it up to a loved one who has dementia. However, it is critical to have such discussions and ensure your loved one hangs up the keys before she/he, or anyone else, gets hurt.

Driving is a complex activity that requires physical coordination, good judgement, and the ability to make quick decisions and stay focused in sometimes chaotic conditions. These are all skills that can be compromised, sometimes even in the early stages of dementia, dramatically affecting the risks of driving. >>



“Studies have shown that the driver with dementia is at increased risk to cause traffic accidents,” reported Dr. Laura B. Brown and Dr. Brian R. Ott in their research paper, “Driving and Dementia: A Review of the Literature” published in the December 2004 issue of the *Journal of Geriatric Psychiatry and Neurology*. In fact, they stated that overall “there is probably a 2- to 8-fold greater risk of crashes for elderly drivers with mild to moderate dementia compared to those not demented.”

They continue to say, however, that there is evidence to suggest

“NOT ALL PERSONS WITH DEMENTIA ARE INCOMPETENT DRIVERS, PARTICULARLY IN THE VERY EARLY STAGES.”

Everyone with dementia will eventually have to modify and then stop driving completely, but the challenge is figuring out when these changes should happen. The answer is different for each person because dementia affects every individual differently. Most experts agree that simply getting a diagnosis of dementia is not, on its own, reason enough to take away someone’s licence. Each person must be assessed individually on her or his competence to drive, and assessments must occur frequently because the disease progresses over time.

DENIAL: DEMENTIA’S UNIQUE IMPACT ON DRIVING

With age, driving skills change for virtually everyone as vision and hearing fade, reaction time slows and mobility decreases (e.g., making it hard to turn your head and see behind you while you drive in reverse). Yet, for people with dementia, the challenges are even greater. The biggest difference is that people without dementia that experience the common changes that come with age will often realize their driving skills have been impaired and independently make changes to their driving behaviour to increase safety, e.g., avoiding driving at night, on the highway, or in poor weather.

Dementia patients, however, frequently lack the capacity to understand what is happening to them and are likely to minimize the complexity of driving, overestimate their own abilities, and resist making any changes because they don’t think anything is wrong. In essence, they struggle with the combined impact of compromised driving skills plus impaired self-assessment skills, making it essential for others to intervene to ensure everyone’s safety. While health professionals or governmental departments responsible for licences may play a role in driving cessation, **FAMILY MEMBERS ARE OFTEN IN THE BEST POSITION TO WATCH FOR SIGNS OF DECREASED DRIVING SKILL**, bring any changes to the attention of professionals, and help the person with dementia transition out of driving.

WARNING SIGNS

Below is a list of some of the key signs to watch for indicating the dementia may be impacting driving to an extent that it is no longer safe. Consider the frequency and severity of the incidents you observe, and watch for patterns. Drastic action may not be necessary if incidents are isolated or minor.



GETTING LOST IN FAMILIAR TERRITORY



DRIVING TOO SLOW OR FAST, OR STOPPING FOR NO REASON



RIDING THE BRAKE, OR CONFUSING THE BRAKE AND GAS PEDALS



OTHER DRIVERS FREQUENTLY HONK THEIR HORNS



DAMAGE (I.E., SCRAPES OR DENTS) ON THE CAR OR GARAGE



DIFFICULTY WITH PARKING



FAILING TO NOTICE/OBEY TRAFFIC SIGNS OR SIGNALS



DIFFICULTY WITH TURNS, LANE CHANGES OR HIGHWAY EXITS



INCORRECT SIGNALING



NEAR MISSES OR ACCIDENTS

The Hartford Financial Services Group in Hartford CT offers a free educational guide called “At the Crossroads: Family Conversations About Alzheimer’s Disease, Dementia & Driving” that includes a comprehensive worksheet listing all of the warnings signs to look for, along with other helpful information and worksheets to assist people with dementia and their families in working their way through the driving cessation process. This free guide can be viewed online at: https://www.thehartford.com/sites/the_hartford/files/cmme-crossroads.pdf

ASSESSING WHEN IT’S TIME TO STOP DRIVING

The process of assessing when a person with dementia should stop

driving often begins with a family conversation. The “At the Crossroads” guide recommends a relative who knows the person with dementia well be the one who initiates the conversation, and to do it as early as possible. Do not wait until the person has an accident or commits a traffic violation to raise the subject.

Talking about it early will increase the chances that the person comprehends and remembers your discussion, and it’s the best time for exploring options together about gradually limiting and then eventually stopping driving.

BE EMPATHETIC, APPEAL TO THEIR SENSE OF RESPONSIBILITY, AND OFFER TO HELP THEM FIND NEW WAYS TO GET AROUND.

Frequent, short conversations are thought to be more effective than a single, long conversation. However, if the person is already showing significant impairment of driving abilities and safety is an urgent concern, one conversation may have to be enough. Be direct and firm while maintaining a calm, reasonable tone.

The Canadian Automobile Association (CAA) and The American Automobile Association (AAA) have online resources to help older adults self-evaluate their driving skills. Both offer tools that may help in the preliminary assessment of skills but are not substitutes for an official driving evaluation. The results are intended to help older adults become aware of the potential impairments that may be affecting their safety behind the wheel, and to guide subsequent discussions with professionals who are qualified to conduct an official evaluation such as a doctor, occupational therapist, or driving rehabilitation specialist.

➤ CAA’s website includes a section with resources specifically for senior drivers (<http://seniorsdriving.caa.ca>). In the subsection on assessing your driving skills (<http://seniorsdriving.caa.ca/assess-your-driving-skills>), there are two different options:

- (1) a form you download and complete in about 15 minutes; and
- (2) an interactive, online test that requires a partner to complete, and takes about 45 minutes.

➤ AAA has a section on their website dedicated to the subject of seniors and driving (<http://seniordriving.aaa.com>), including a link to an interactive, online driving evaluation (www.roadwiseonline.org). This free, confidential, self-evaluation takes 30 to 45 minutes to complete and assesses

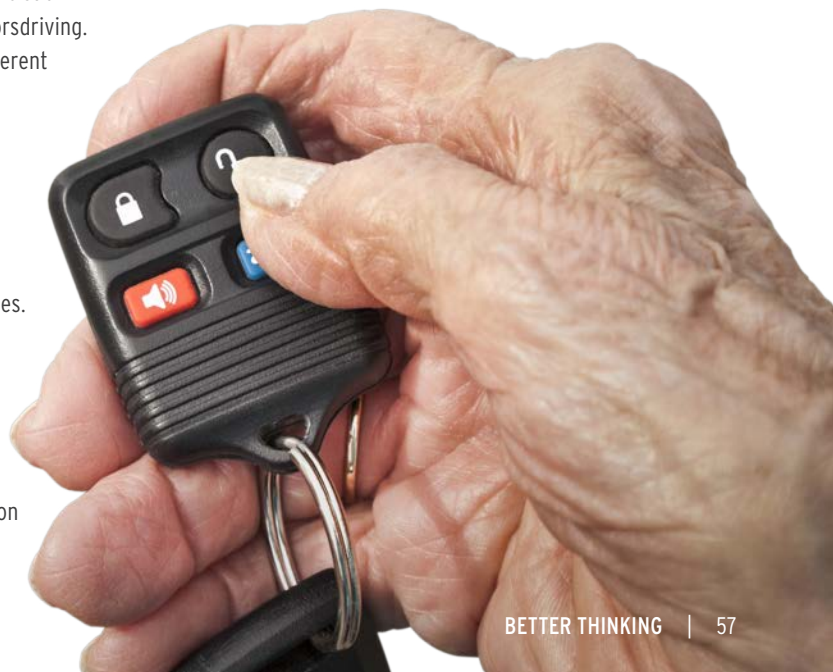
potential driving risks in eight key areas.

Some individuals with dementia are more accepting of advice to restrict or stop driving if it comes from their doctor or a licensing official, so contacting one of these professionals may be the next step after a family conversation and/or online self-assessment. Doctors sometimes assess the patient about their competence to drive, but sometimes they will refer patients to other professionals, at either a public or private facility, for an in-depth driving assessment. These assessments vary from place to place, and might include a written test, driving simulation test and/or a road test. Your local Alzheimer’s Association can help you find a driving assessment program in your area.

HELPING WITH THE TRANSITION

When it’s clear that it is time for driving to stop completely, the Alzheimer’s Association suggests the following tips to help ease the transition:

- (1) acknowledge the loss;
- (2) arrange for alternative transportation;
- (3) solicit the support of others (e.g., physician, friends, relatives, insurance agent);
- (4) make the car less accessible;
- (5) require the patient to take a driving test; and
- (6) be firm. >>



Some advanced dementia patients may not stop driving just because they are told they must, even if their licence is revoked. In cases like this, where the person with dementia does not understand what is happening or disagrees with it, you may have to take the keys away, disable the vehicle (e.g., by removing key engine parts), or remove/sell the vehicle. Such actions should only be taken as a last resort since the person with dementia will likely perceive them as extreme and disrespectful.

TECHNOLOGY TO AID IN A SAFE SHIFT TO WALKING

Driving is not the only way to get around, and walking is a great option that offers more than just transportation. Walking also offers the benefits of exercise and fresh air. Since people with dementia often get disoriented or lost, caregivers can be reluctant to allow the person the freedom to head out on foot alone. GPS (global positioning systems) locating devices are beginning to change that.

GPS devices for people with dementia vary and might be a phone-like device worn around the neck, or a lockable watch or even a shoe insole. The services provided will vary depending on the technology and may include:

- » real-time location that can be viewed on an online map;
- » geofencing (designation of a safe zone, and alerts sent to caregiver when person wearing device wanders outside of the boundaries);
- » two-way voice communication;
- » panic button for direct family contact; and
- » breadcrumb trail (showing the path the person is on—useful if the device loses battery power or enters a large building where the signal may be blocked).

USING A GPS DEVICE CANNOT GUARANTEE THAT SOMEONE WITH DEMENTIA WON'T GET LOST OR CAN BE FOUND IF THEY DO, BUT IT CERTAINLY CAN HELP SIGNIFICANTLY LOWER ANY RISKS OF INDEPENDENT WALKING OR WANDERING.

GPS devices have worked well in pilot tests to help people with cognitive impairment maintain their ability to go out for walks independently, and as a tool to help keep people safe who have a tendency to wander.

Alberta Health Services partnered with researchers at the University of Alberta to study the effectiveness of SafeTracks GPS devices to prevent people with cognitive impairments from getting lost. The Locator Device Project was a 12-month trial involving participants who were living in the community (i.e. not in a care facility), and were actively mobile outside of the home.

Feedback was collected from the GPS users and their caregivers and revealed that the device provided independence to the person with cognitive impairment and peace of mind to the caregivers. It also revealed a high level of intention to use GPS devices beyond the end of the study period.

A study of 200 people with dementia in Norway – part of the “Trygge Spor og Samspill” (safe tracking and interaction) public sector initiative – had each person use a GPS device when heading out. The research found that

THE USE OF GPS BY PEOPLE WITH DEMENTIA HELPED ALMOST ALL PARTICIPANTS ACHIEVE “AN INCREASED SENSE OF SECURITY, FREEDOM AND QUALITY OF LIFE.”

This was true for both the people with dementia, their next of kin, and professional caregivers. (A very small number of participants did not feel so positively about the GPS technology and felt that they were “under surveillance.”) GPS devices were also found to offer the additional benefit of potential cost savings in cases where the technology allowed someone to live at home longer and where family caregivers were able to spend more time at work and less time directly supervising the person with dementia.

Because of the progressive, degenerative nature of dementia, GPS devices won't work as a tool to support independent mobility for the long-term. (The Norway study found the average period of use was between 10 and 11 months.) In the short-term, however, GPS technology holds much promise for allowing people with dementia who would rather go out than sit around inside, the freedom to live an active, independent life for as long as possible. 🌐





DO YOU HAVE THE GUTS TO BE HEALTHY?

Probiotics: the new frontier
in brain health

Do you have the guts to achieve optimal brain health? An intriguing body of research, once on the fringes of gastroenterology, has entered the scientific spotlight. In it are discoveries of a gut-brain-microbiota connection and the idea that organisms in your belly might be influencing your brain, not just the other way around.

Traditionally, neuroscience has looked to the brain for solutions to disorders like depression and anxiety, or diseases like Parkinson's and Alzheimer's. But with the discovery of the size and complexity of the human microbiome, the scientific community has begun to re-evaluate, taking a closer look at brain chemistry and emotional behaviour from the bottom up. >>

BRAIN BELLY

The human microbiome is a wondrous thing. In your body, on your skin and especially inside your gut are 100 trillion living microorganisms, mostly bacterial. Though these microbes are not human, we cannot live without them. They are an integral part of our internal ecosystem, playing a crucial role in digestion, nutrient absorption, immune response, and maintaining the intestinal barrier.

PROVOCATIVE RESEARCH, CONDUCTED MOSTLY OVER THE LAST DECADE, IS SHOWING THAT GUT MICROBIOTA ALSO INFLUENCES THE BRAIN.

Preclinical studies repeatedly suggest that microbiota and its metabolites help modulate stress, emotional behaviour, visceral pain and brain biochemistry. The picture has emerged of a vital brain-gut-microbiota axis in which microbes communicate with the brain and the brain communicates back.

“It’s a very complex system, probably the most important regulatory system in your body,” says Emeran Mayer, MD, PhD and author of *The Mind-Gut Connection: How the Hidden Conversation within our Bodies Impacts our Mood, our Choices and our Overall Health*. “The gastrointestinal tract is not just there to grind everything up and give us energy. It’s a supercomputer for the whole brain. It plays a role in homeostasis, keeping us balanced. Whatever we put into our gut has effects far beyond it.”

WILL A YOGURT A DAY KEEP THE PSYCHIATRIST AWAY?

Probiotics (from pro and biota, meaning “for life”) are defined by the World Health Organization as “live organisms which, when administered in adequate amounts, confer a health benefit on the host.” They are naturally found in fermented foods like yogurt, sauerkraut, kefir, miso soup, kimchi, kombucha tea and some cheeses.

Preclinical evidence suggests that probiotics can indeed modulate brain health. For anxiety and depression, the probiotic species that seem to work best are Bifidobacterium and Lactobacillus. However, within these genera are many specific strains. Only a few will have any positive effects. The trick to turning probiotics into trusted psychobiotic treatments will be in pinpointing the exact strains and combinations of strains that are most effective, understanding how they work, and successfully translating this to the human experience.

“The bottom line is that these bugs have multiple pathways whereby they influence the local nervous system and the brain. Symptoms of psychiatric disease can be alleviated by giving these bugs to animals, but it’s early days in the human,” says Dr. Bienenstock, Director of the Brain-Body Institute at McMaster University and St. Joseph’s Healthcare in Hamilton, Ontario.

It’s early days, but promising nonetheless:

▶ In 2013, Kirsten Tillish and colleagues at UCLA demonstrated that human consumption of a fermented milk product with probiotics affected the activity of brain regions that control central processing of emotion and sensation.

▶ Last year in the Netherlands, Laura Steenbergen et al. found that taking a multispecies probiotic product reduced cognitive reactivity to sad mood, lessening rumination and aggressive thoughts.

▶ At Oxford University, Kristin Schmidt et al. found that taking a specific prebiotic significantly lowered secretion of the stress hormone, cortisol, in volunteers. Prebiotics are indigestible food fibres that promote the growth of beneficial gut microorganisms.

Before you run to your natural health food store, there are limitations to applying these results. The studies were conducted on a small scale, with samples of between 36-45 subjects. All participants were healthy, so while pre-or probiotics may have improved their emotional responses, we cannot know definitively if they would have the same effect on someone with a psychiatric illness.

Finally, the studies were conducted in partnership with the probiotic industry. In Tillisch et al., Danone Research funded the study, provided the product, and three of its researchers were on the investigation team. In Schmidt et al., the study was funded by Clasado, the manufacturer of the prebiotic supplement that tested positively, as part of its ongoing research collaboration with Oxford.

Industry partnerships do not mean the research lacks credibility. It does mean, though, a high likelihood that the strains being tested – and whom they are being tested on – are geared for the consumer markets targeted by these companies. Small-scale studies on humans, combined with preclinical work on rodents, are often enough to convince the FDA or Health Canada to allow health claims on these products. To prove the efficacy of potential psychobiotics, large-scale clinical studies on humans will be required. Granting agencies will need to pony up. “Much more information is going to be available in the next two to three years,” Dr. Bienenstock says. “There’s nothing now that isn’t potentially affected by bugs in the gut. You’ve taken the lid off a big thing.”

With additional studies taking place around the world, Dr. Bienenstock is not the only one who is optimistic about what more is to come.

OF MICE AND WOMEN

A ground-breaking study that helped add “microbiota” to the more established concept of the gut-brain axis took place in 2004 by Sudo and colleagues. Comparing the stress responses of germ-free

mice with control mice, they found that the germ-free animals had an exaggerated hypothalamic-pituitary-adrenal (HPA) axis stress response to mild restraint, an effect that was partially reversed by a microbial transplant from the control animals, and fully reversed by colonization with the probiotic *Bifidobacterium infantis*.

In both mice and humans, colonization of gut microbiota takes place during and after birth. When human infants are delivered vaginally, their flora resembles that of the mother's vaginal microbiota. When born by caesarean section, it resembles the mother's skin. The baby's first year sees the flora increase in number and diversity, until a complex, adult-like microbiome is developed.

Germ-free rodents are not given this opportunity for postnatal colonization. As such, they have allowed scientists to more directly assess the impact of microbiota on brain and behaviour. In a landmark study in 2011, Premysl Bercik and colleagues at McMaster University in Hamilton, Ontario showed that changes in gut bacteria altered brain chemistry and behaviour. In one experiment, germ-free mice with a passive genetic disposition were colonized with bacteria from more active mice, and vice versa. The formerly passive mice became more daring, while the active ones behaved passively.

Meanwhile, at University College Cork in Ireland, the prolific investigations of Ted Dinan and colleagues birthed a new concept: psychobiotics. Reviewing the preclinical evidence, which suggested that a class of probiotics could alleviate symptoms of depression and anxiety, reduce HPA axis (stress) activity, and deliver neuroactive substances like serotonin, the authors posited that these live organisms could be used to treat psychiatric illness.

PSYCHOBOTICS, AND THE IDEA THAT WE CAN HEAL THE MIND BY ALTERING THE GUT, HAVE CREATED A GREAT DEAL OF EXCITEMENT IN THE MAINSTREAM MEDIA OVER THE LAST FEW YEARS.

Articles and blogs often promote the brain-curing effects of one probiotic strain or another, but researchers urge caution. Most of the information available to date has come from studies conducted on animal models, commonly mice.

"These animal experiments are beautiful and fascinating, but you have to be extremely careful in extrapolating them to humans," says Dr. Mayer. "The human brain is just so much more complex (than the mouse brain). It's like comparing an iPhone today to an HP calculator from 20 years ago." 🌐

A GLOBAL ALLIANCE

An unprecedented global partnership has been formed to address women's brain health issues, including sex-based research and caregiver burden. Women are not only at greater risk of developing Alzheimer's disease when compared to men per capita, but they also bear six times the cost of Alzheimer's disease care than men do.

The Global Alliance on Women's Brain Health, created in 2015 by Women's Brain Health Initiative, WomenAgainstAlzheimer's, Alzheimer's Research UK, and 21st Century BrainTrust®, is a concerted effort to garner global cooperation among women leaders and fund research for women's brain health around the world. With a collective passion for advancing women's brain health, the Alliance wants to ensure women's brains are prioritized and moved to the front of global health agendas.

As of 2015, 47.5 million people worldwide have Alzheimer's or a related dementia, or more than the total population of Canada with numbers set to increase to 74.7 million by 2030 and 131.5 million by 2050. In Canada today, the combined direct (medical) and indirect (lost earnings) costs of dementia total over \$33 billion per year.

If nothing changes, this number will increase to \$293 billion a year by 2040. The cost of caring for Alzheimer's patients in the US was estimated to be \$226 billion in 2015. The global cost of Alzheimer's and dementia is estimated to be \$605 billion, which is the equivalent to 1% of the entire world's gross domestic product.

Over 30 million women worldwide are living with dementia. This is a number that cannot be ignored and needs our collective support and effort.

Find out more by visiting the global alliance website: BRAINHEALTHALLY.ORG

BEYOND BORDERS

A World United for Women's Brain Health

FOUNDING PARTNERS



Women's Brain Health Initiative (WBHI) is a Canadian and US charitable organization inspired to combat women's brain health disorders through investment in focused, innovative research at leading institutions around the world. WBHI supports urgently-needed, leading-edge, peer-reviewed research on women's health and brain aging, to improve diagnostic and treatment methods. Ultimately, this research will improve brain health outcomes for women throughout the world. WBHI's awareness and fundraising initiatives include education programs and sales of the iconic Hope-Knot. All monies raised are managed by WBHI in accordance with its board-approved governance policies on investments and distribution of funds. wbhi.org



Alzheimer's
Research
UK

The Power
to Defeat
Dementia

Alzheimer's Research UK is the UK's leading dementia research charity, and the second largest charity funder of dementia research in the world. We are funding £26 million in world-class research at leading universities and research institutions across the UK and to date have funded nearly £62 million in research projects. Our goal is a world free from dementia. As research experts, we are committed to finding new ways to diagnose, prevent, treat and cure dementia. Our research strategy is targeted to deliver research that offers most potential for health benefit. Increased and sustained investment in research is critical to help deliver the treatments and outcomes that will offer hope to people living with dementia and reduce the huge societal and economic burden. alzheimersresearchuk.org

WomenAgainst
Alzheimer's

A Network of UsAgainstAlzheimer's

WomenAgainstAlzheimer's, a network of UsAgainstAlzheimer's, unites women across the globe to find a cure for Alzheimer's. Our growing network of women is impatient with the slow progress being made in the Alzheimer's fight. Driven by our passion we are committed to disrupting current "business as usual" approaches to funding, research, and advocacy in order to bring Alzheimer's out of the shadows and into the spotlight. We will aim to bring the energy and commitment from the Global Alliance to our other priority areas in driving public funding for research in gender sensitivity, clinical trial recruitment, lessening the burden of care and promoting dementia friendly communities. Because women won't wait. usagainstalzheimer.org

21CBT

21ST CENTURY BRAINTRUST®
BRAINSpan—LIFESpan

The 21st Century BrainTrust® (21CBT) is a virtual research ecosystem designed to empower personal brain health and support early diagnosis using self-administered mobile applications for personal measurement and monitoring of cognition. Its mission is to engage a new generation of innovation: think new digital biomarkers, mapped using the power of self-administered cognitive testing as a sensitive, early screening tool for all brain traumas, Alzheimer's and related dementias. 21CBT promotes novel technologies that offer low-cost screening capabilities for future prevention trials to facilitate enrollment as well as exploratory trial endpoints. The 21st Century BrainTrust® is a collaboration by the Geoffrey Beene Foundation Alzheimer's Initiative, BrightFocus Foundation, Cleveland Clinic/Lou Ruvo Brain Institute and UsAgainstAlzheimer's. 21cbt.org

THE HOPE-KNOT PROJECT

TO COMBAT BRAIN-AGING DISEASES THAT AFFECT WOMEN

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 brain-aging 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.

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, wife, 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.

WILL YOU FORGET? WE HOPE-KNOT. HOPEKNOT.ORG



Sterling Pin
\$130

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.

Proceeds from every HOPE-KNOT sold help support gender-based brain aging research.

NEW!

Sterling
Earrings*
\$225



Stainless or Sterling Pin*
\$10 | \$130



Sterling Pendant & Chain*
\$180



Sterling Cufflinks*
\$295

Women's Brain Health Initiative Hope-Knot* products 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
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JOY'S SIMPLE BUTTERNUT SQUASH SOUP

INGREDIENTS - SERVES 4

- 2 butternut squashes, cubed (approx. 8-10 cups)
- 2 white onions, chopped
- 2 cans (14oz ea) full fat organic coconut milk
- 2 tbsp extra virgin olive oil
- Sea salt and black pepper

INSTRUCTIONS

1 Preheat oven to 350°F (180°C) degrees. Place butternut squash into a baking dish, drizzle with olive oil and season with sea salt and pepper. Cover with a lid and bake for 1 hour or until squash is fork tender.

2 Meanwhile, sauté the onions on medium in a touch of olive oil until slightly brown.

3 Let squash and onions cool. Then puree. There are a few different ways to puree. Either place both ingredients into a food processor or blender, add coconut

milk and blend until creamy. Or, place all ingredients into a large soup pot and blend with an immersion blender.

4 Reheat the soup before eating. Just don't heat it too hot otherwise the good fat will curdle in the coconut milk. Add any seasonings you wish.

5 Depending how big your squashes are you may wish to add more liquid for a thinner consistency. If you've run out of coconut milk, just add a touch of water as needed.

BUTTERNUT SQUASH

is full of beta carotene, Vitamin C, folic acid & niacin, each important for your brain and your body.

All recipes are courtesy of
JOYOUSHEALTH.COM

BAKED LEMON PEPPER SALMON WITH "CREAM" SAUCE

INGREDIENTS - SERVES 2

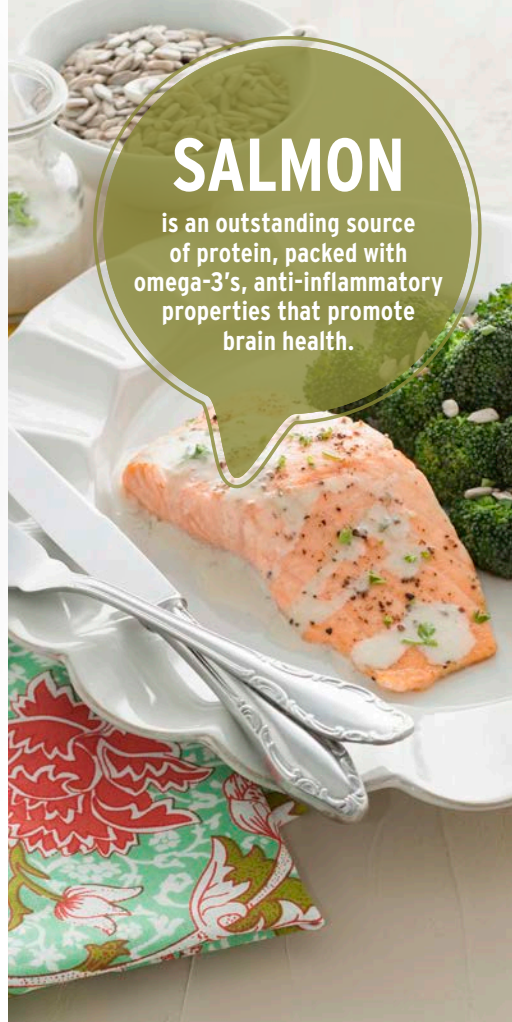
2 salmon fillets, 6 oz (170 g) each
Juice of 1/2 lemon
Sea salt and freshly ground pepper

LEMON PEPPER TAHINI SAUCE

2 tbsp (30 mL) extra-virgin olive oil
Grated zest and juice of 1 lemon
1/4 cup (60 mL) tahini
1 tbsp (15 mL) raw honey
A sprinkle or two of sea salt and lots of freshly ground pepper

INSTRUCTIONS

- 1 Preheat oven to 350°F (180°C).
- 2 Place salmon fillets on a baking sheet. Drizzle salmon with lemon juice and season with sea salt and black pepper. Bake for 10 to 15 minutes or until the inside of the fish is no longer dark pink.
- 3 Meanwhile, make the sauce. In a small bowl, stir together oil, lemon zest, lemon juice, tahini and honey. Season with sea salt and pepper.
- 4 Arrange baked salmon on plates and drizzle with sauce.
- 5 Serve and enJOY!



SALMON

is an outstanding source of protein, packed with omega-3's, anti-inflammatory properties that promote brain health.

MEMORY MORSELS®

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

KALE SALAD WITH CREAMY CASHEW DRESSING

SALAD - SERVES 2-4

4-5 cups of chopped kale and romaine
4 carrots, chopped
Half cucumber, chopped
1/4 cup sultana raisins

DRESSING

1 cup soaked cashews, water discarded
1-2 garlic cloves
1 tbsp ground onion powder
1 tbsp dried Italian seasoning
1/2-1 cup filtered water*
1.5 tbsp apple cider vinegar
3 tbsp extra-virgin olive oil
Pinch sea salt and ground black pepper

INSTRUCTIONS

- 1 Combine all ingredients into a food processor or blender and blend until creamy.
- 2 Combine salad ingredients in a large bowl, toss with dressing. You'll likely have some dressing leftover for dipping and future salads.

Notes *I've given you a range for water because it just depends on how creamy you like it. With 1/2 cup of water only it's also great as a healthy dip for veggies or crackers.

The dressing recipe will give you more than enough for the salad.



KALE

is a nutrient-rich vegetable loaded with omega-3's, Vitamin B to help ward off brain-aging, & Vitamin K, a powerful anti-oxidant important for your brain.



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Your support, whatever the amount, will help combat brain aging diseases in women.

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Women's Brain Health takes issues of scientific integrity, transparency and disclosure very seriously. We remain committed to providing our readers and supporters with the best available information on the brain aging diseases that affect women.

In the last issue of Mind Over Matter®, we included an article contributed by naturopathic doctor, Penny Kendall-Reid. Among other products, Dr. Kendall-Reid included a recommendation for Serentin Plus which is produced by Douglas Labs. The article failed to disclose Dr. Kendall-Reid's commercial relationship with Douglas Labs. It is an important omission and one we regret.

We are truly grateful to



Brain Canada
Foundation

and all those who generously supported this publication:

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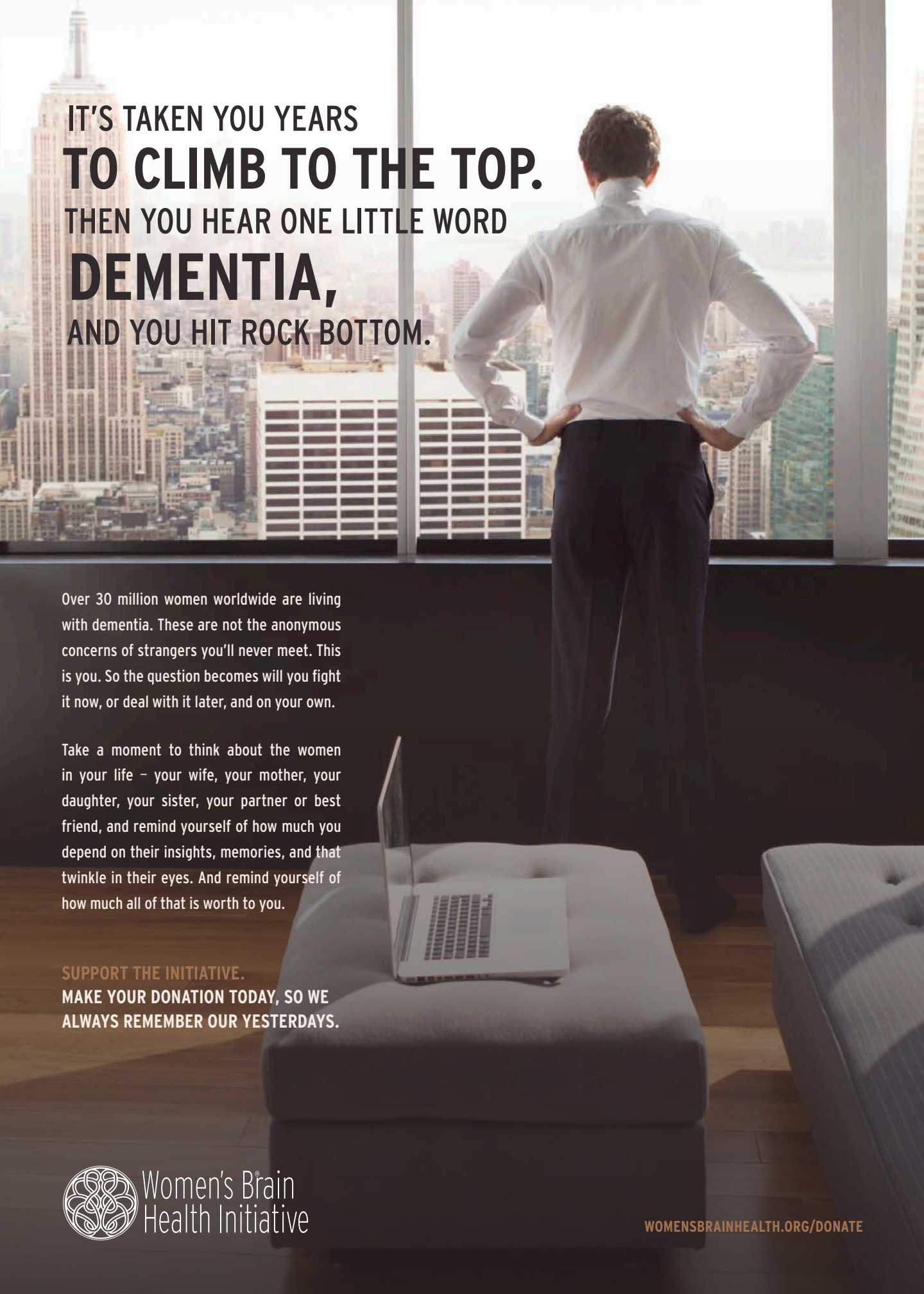
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TO CLIMB TO THE TOP.
THEN YOU HEAR ONE LITTLE WORD
DEMENTIA,
AND YOU HIT ROCK BOTTOM.

Over 30 million women worldwide are living with dementia. These are not the anonymous concerns of strangers you'll never meet. This is you. So the question becomes will you fight it now, or deal with it later, and on your own.

Take a moment to think about the women in your life – your wife, your mother, your daughter, your sister, your partner or best friend, and remind yourself of how much you depend on their insights, memories, and that twinkle in their eyes. And remind yourself of how much all of that is worth to you.

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