

# MIND OVER MATTER™

**MIND DIET**  
**HEY GIRLFRIEND**

**WHAT'S YOUR  
BRAIN AGE?**

**GRANDMA...  
DO YOU KNOW WHO I AM?**

**THE EYES (& NOSE) HAVE IT**

**Beyond The Bikini**

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



Women's Brain Health Initiative

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# EMPOWERING MODERN WOMEN TO RETHINK THEIR HABITS

## Editor's Letter

As the leader in the fight against women's brain aging disorders, Women's Brain Health Initiative (WBHI) continues to provide you with the most current thinking on ways to maintain a healthy body and mind. We hope that this latest issue of MIND OVER MATTER will provide you with more thought-provoking information about women's aging brain health.

According to a recent Harris Poll, more than 75% of Millennials, Generation Xers and Baby Boomers worry about what will happen to their memory as they age. MIND OVER MATTER empowers modern women to rethink their habits and make better long-term choices for themselves and their families. This magazine also encourages younger women to look after their brain health, since research now shows that the sooner you look after your brain health, the better the cognitive outcome.

There have been many exciting developments at Women's Brain Health Initiative since our first issue of MIND OVER MATTER was published in 2014.

We have begun creating a global discussion on women's brain health by taking strides to increase awareness in Canada and the United States. Our New York City launch in March 2015 made a huge impact on awareness and support for this cause. The event was held at Donna Karan's Urban Zen location, supported by co-hosts Martha Stewart, Trudie Styler, Wendi Murdoch, Ivanka Trump, Arianna Huffington, Tamara Mellon and Barbara Walters (see pg. 27).

This exposure has resulted in an opportunity to work with Maria Shriver, an incredible spokesperson for women's brain health and brain-aging disease prevention. Maria encourages public education and empowerment around the disease and acknowledges those who dedicate their time to fighting Alzheimer's and dementia on her website's "Big Wall of Empowerment". As the WBHI spokesperson, I was included in the group of women featured. What an honour to represent you in this way.

The recognition for our work was also featured at a gathering of global experts in Washington, hosted by Women Against Alzheimer's Network and Alzheimer's Research UK, with a focus on removing the gender gap in the Alzheimer's Research Pipeline. I was invited to speak about the strides WBHI has been making in Canada.

We have also seen continued success in Toronto with our second Executive Brain: Life Lessons from Smart Woman fundraiser, host-

ing influential women such as fashion expert Jeanne Beker, CBC's Amanda Lang, TIFF Executive Director Michèle Maheux and Chubb Insurance President and CEO Ellen Moore. By leveraging amazing relationships and extending our reach into the US, momentum is growing every day.

While we help educate the general public on ways to protect our brain health through vehicles like MIND OVER MATTER, WBHI also supports innovative research to combat brain-aging diseases that affect women. There are enough biological questions pointing to increased risk in women, but we need to find out why. There is a lot that is not known or understood.

Thanks to many of our donors, for the first time in Canada, sex and gender will now be taken into account in all aspects of the research. This means from cell to lab studies, observational research and controlled clinical trials, all Canadian studies will incorporate analyses to understand the role of sex on brain health outcomes. Women's Brain Health Initiative will be at the forefront of these studies and will be able to report on new knowledge and advances made to address women, sex and gender gaps and challenges.

While we fund research to support the women in our lives, to protect the memories of our mothers, wives, sisters, daughters and best friends, we must also take control of our futures by making positive changes to our lifestyle - through exercise, diet, mentally challenging activities, stress reduction techniques and optimizing our sleep, we can impact our lives to stay independent with our cognitive skills intact, for as long as possible.

You can help us continue to make a difference in the lives of women everywhere through our education initiatives and gender-focused research. There are many ways to show your support; no donation is too small. For more information, please visit our website [wbhi.org](http://wbhi.org) or call us toll free at 1-888-927-2011. Together, we can reinforce how very much our grey matter matters.



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WOMEN'S BRAIN HEALTH INITIATIVE'S SECOND EDITION OF MIND OVER MATTER WAS MADE POSSIBLE THANKS TO THE GENEROSITY AND ENCOURAGEMENT OF MARGARET NIGHTINGALE.

I miss my mother Dorothy every day.

She passed way in 2005, at the too young age of 76, from stomach cancer. I see now that she was missed in many ways while she was right in front of us. In the case of my mother, it was her amazing strength, resilience and competence that had me fooled.

Dorothy was a skilled hairdresser and teacher who was always beautifully put together. The house was clean, the freezer full of home-cooked meals and my father Ray, who had Parkinson's and dementia, was well looked after. It seemed effortless for her to swing his wheelchair into the trunk of the car, get him to all his medical appointments and keep track of his medications and meals. Like most of the women and caregivers in our lives, she just seemed so capable. But we had no idea what she was going through.

While I know that Dorothy's story is not unique or singular, we now have an opportunity to share what scientists, clinicians and healthcare specialists are learning about women's brain health. Through Women's Brain Health Initiative and this important magazine, we can connect and

learn about ways to protect our brain health as we age, and support each other while caring for our loved ones.

When Lynn Posluns came to me with the idea of the Women's Brain Health Initiative I knew I had the opportunity to help turn our attention towards all those amazing, capable women. Education and research helps everyone. Let us not miss this moment; let us not miss each other.

In this issue, we read about the incredible healing power of music. I have seen and felt its magic when it brought peace and comfort in my mother's last months. Playing the piano helped my husband, Buddy, recover from a devastating stroke. The only way my dad, Ray, would get out of his wheelchair was to dance with me when he heard his familiar Scottish music. My mother was a great dancer and I know that if she were here today she would say that we are all in this dance together. Please be our partner.

**Margaret Nightingale, Toronto**

# CONTRIBUTORS



## STEPHANIE HAHN | WRITER

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



## MARGI OKSNER | WRITER

Margi is the principal of Margi Oksner and Associates, a full service consulting firm that offers strategic, creative and business planning in the philanthropic sector. She is also a professional writer for many of Toronto's foremost volunteer organizations. In her 35 years as a fundraising professional, Margi has crossed many different sectors in the community and is dedicated to promoting women's brain health.



## ROSE HENDRIE | WRITER

Rose is a writer and lover of art, history and literature. Originally from England, she now lives and works in Toronto. "Alzheimer's is a disease that has affected several members of my family and so the work of WBHI is very close to my heart. Writing for this magazine has given me the chance to improve my own understanding of this complex and devastating disease, as well as to share this knowledge with others."



## VANESSA MORCOM | WRITER

Vanessa is the principal of Morcom Media, a preeminent marketing-to-women public relations agency in Toronto. She is a strong believer in the "whole brain" approach to problem solving, with a deep dive in research and analytics supporting insights and strategic platforms. "WBHI is the foremost authority on international women's brain health issues. There is hope. WBHI is leading a new generation of women to "think big" and take action for a brighter future."



## ROSE REISMAN | CHEF & AUTHOR

Rose Reisman has been a leading authority on the art of eating and living well for over two decades. A motivational speaker, columnist, TV personality and author of over 18 cookbooks, Rose believes in the importance of disease prevention and spreading awareness on how essential a nutritious diet is to our wellbeing. With 70% of new Alzheimer's patients being women, Rose understands how vital brain health is, and is passionate about teaching healthy living as a priority from a young age.



## VITINA BLUMENTHAL | CREATIVE DIRECTOR

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 a proud to creatively help spread awareness and knowledge for women to lead 'brain healthy' lifestyles."



19 Fear Factors

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# BEYOND THE BIKINI

SEX DIFFERENCES IN RESEARCH PROVE MORE VALUABLE THAN EVER BEFORE



**Larry Cahill, Ph.D.**, is a professor in the Department of Neurobiology and Behaviour at the University of California, Irvine. After working on memory-enhancing drugs at G.D. Searle & Company in Illinois for two years, he earned his Ph.D. in neuroscience from the University of California, Irvine, in 1990. Following postdoctoral research in Germany, he returned to UC Irvine to extend his research to studies of human subjects, which in turn led to his discoveries about sex influences on emotional memory, and to his current general interest in the profoundly important issue of sex influences on brain function.



## CHANGING TIMES

Twenty years ago, if someone said “women’s health,” it usually meant what is commonly referred to as “bikini medicine”, a term used to account for sex-specific conditions that affect women: breast and ovarian cancers, pregnancy, and menstrual cycles. However, for parts of the body men and women share, such as heart, kidneys and brain, most of the studies were done predominantly on men.

More and more, scientists are realizing that these differences are dangerously understudied and that pervasively and fundamentally, sex matters.

Larry Cahill, a neuroscientist at the University of California Irvine, put it this way in a 2014 interview for 60 Minutes with CBS News reporter Lesley Stahl: “There’s this assumption that you [Lesley] are me [Larry] with pesky hormones. We’re studying all the fundamental things in you without this sort of nuisance stuff; that’s literally an assumption on which all of biological medicine, especially neuroscience, which I know best, has been built.”

Cahill says that even if this view was once defensible, it is no longer, for the simple reason that abundant evidence now shows that sex influences on brain function are universal, found at every level of neuroscience from the behaving human to the ion channel. These sex influences can modify, negate, or even reverse findings.

## PERSPECTIVES ON PAIN

Cahill gives an example from animal research that further emphasizes this point. He cites Mogil and Chanda<sup>1</sup>, who are at the

forefront of understanding sex influences on brain mechanisms of pain. Despite the general reluctance to study sex influences on pain, the accumulated evidence clearly demonstrates that neural pain mechanisms are both similar and different in males and females, with the “different” part significantly underrepresented. This data already allows for the conclusions that studying only males will both lead, and mislead, the search for effective pain treatments in women. After surveying the field, Mogil and Chanda concluded that “given these facts, one might argue that basic scientists are shirking their responsibility to half of the human population by avoiding direct animal models of them. We simply do not see any valid excuses remaining for the continued

## ABUNDANT EVIDENCE NOW SHOWS THAT SEX INFLUENCES ON BRAIN FUNCTION ARE UNIVERSAL, FOUND AT EVERY LEVEL OF NEUROSCIENCE

exclusion of female rodents from basic science studies in pain.”

## EXCITING TIMES IN NEUROSCIENCE

“These are exciting times in neuroscience,” says Cahill. “We are uncovering anatomical, chemical and functional differences between the brains of men and women. Researchers are working to determine how these sex-based variations relate to differences in male and female cognition and behavior. Their discoveries could point the way to sex-specific therapies for men and women with neurological conditions such as addiction, depression, schizophrenia and post-traumatic stress disorder (PTSD).”

A PET (Positron Emission Tomography) study by Mirko Diksic and his colleagues

at McGill University showed that serotonin production was a remarkable 52 percent higher on average in men than in women, which might help clarify why women are more prone to depression - a disorder commonly treated with drugs that boost the concentration of serotonin.

A similar situation might prevail in addiction. In this case, the neurotransmitter in question is dopamine, a chemical involved in the feelings of pleasure associated with drugs of abuse. While studying female rats, Jill B. Becker and her fellow investigators at the University of Michigan discovered that in females, estrogen boosted the release of dopamine in brain regions important for regulating drug-seeking behavior. Furthermore, the hormone had long-lasting effects, making the female rats more likely to pursue cocaine weeks after last receiving the drug. Such differences in susceptibility - particularly to stimulants such as cocaine and amphetamine - could explain why women might be more vulnerable to the effects of these drugs and why they tend to progress more rapidly from initial use to dependence than men do.<sup>2</sup>

Neuroscientists are still far from identifying all the sex-related variations in the brain. “It’s like a baby taking its first steps,” Cahill explains. The positive news is that there are growing numbers who do agree that going back to assuming we can evaluate one sex and learn equally about both is no longer an option.

“So the assumption we’re making that sex really doesn’t matter, is not a valid assumption,” says Cahill. “It may not matter. It may matter hugely. It may flip your result - wow, the status quo is not okay. The way we’re doing business has to change.” 🌀

<sup>1</sup> Mogil JS, Chanda ML 2005 *The case for the inclusion of female subjects in basic science studies of pain. Pain* 117:1-5

<sup>2</sup> *His Brain, Her Brain* by Larry Cahill, *Scientific American*, May 2005

# WHAT'S YOUR BRAIN AGE?

*As we age, we lose more and more brain cells and the connection between them weakens; our brain literally starts to shrink. This shrinkage can result in a loss of cognitive ability.*

*Experts are increasingly aware that lifestyle factors - weight, exercise levels, cholesterol, alcohol intake, sleep and socialization - can affect how our brains decline, as well as our risk of developing certain forms of dementia.*

*A new lifestyle-based test is being developed by Dr. Vincent Fortanasce, clinical professor of neurology at the University of Southern California to calculate people's 'brain age'.*

*See how your lifestyle could be speeding up your cognitive decline... ANSWER 'TRUE' OR 'FALSE' TO THE FOLLOWING STATEMENTS;*

1. I get between 7 & 8 hours (or more) sleep each night.
2. I eat at least 5 or more servings of fruits & vegetables high in antioxidants daily.
3. I eat at least one serving of blueberries, raspberries or blackberries daily.
4. I eat baked or grilled fish high in omega-3 fatty acids at least 3 times a week.
5. I take fish oil supplements high in omega-3 fatty acids or flaxseed supplements at least 5 times per week.
6. I take folic acid supplementation & a daily multivitamin.
7. I take a low-dose aspirin daily.
8. I drink red wine or grape juice at least five times a week.
9. I exercise most days of the week for at least 30 minutes each time (total of three hours or more of strenuous exercise weekly).
10. I read challenging books, do crossword puzzles or Sudoku, or engage in activities that require active learning, memorizing, computation, analysis & problem solving at least 5 times a week.
11. I have 'longevity genes' in my family, with members who have lived to 80 and older without memory loss.
12. My total cholesterol is below 5.2 mmol/l (94 mg/dl).
13. My LDL ('bad') cholesterol is below 3.3 mmol/l (60 mg/dl).
14. I am not obese (less than 20 lbs. overweight for a woman; less than 30 lbs. overweight for a man).
15. I eat a Mediterranean style diet - one high in fruits, vegetables, whole grains, beans, nuts & seeds, olive oil & only a little red meat.
16. Instead of butter & margarine, I use olive oil & no trans-fat spreads.
17. I have never smoked cigarettes.
18. I have normal blood pressure.
19. I do not have diabetes.
20. I do not have metabolic syndrome (high triglycerides, central obesity, & hypertension), also called insulin resistance syndrome.
21. I do not have a sleep disorder such as snoring or obstructive sleep apnea or untreated insomnia.
22. Daily uncontrolled stress is not a problem for me.
23. I have a strong support group and enjoy many activities with friends, colleagues, and family members.
24. I have no problems with short or long-term memory.
25. I'm ready to prevent Alzheimer's and am willing to do whatever it takes.

NOW ADD UP HOW MANY QUESTIONS YOU ANSWERED 'TRUE' TO... AND SEE WHAT YOUR SCORES MEAN:

**0-11:** You have a high risk of Alzheimer's. Add 10 years to your chronological age for your Real Brain Age. Call your doctor right now and talk openly about health problems you have. Ask if you're doing all you can to manage these problems.

**12-14:** You have a moderate risk of Alzheimer's disease. Add 5 years to your chronological age for your Real Brain Age. While there's not a lot of disparity between your Real Brain Age and your chronological age, you need to understand the risks you have that increase the chances of Alzheimer's.

**15-19:** OK. Your Real Brain Age is the same as your chronological age. That said, you have a mild risk of Alzheimer's disease, so pay attention. Carefully review the quiz to see what changes you need to make to your diet, exercise, mental stimulation or rest and relaxation.

**20-22:** Not bad! Subtract 10 years from your chronological age for your Real Brain Age. You are doing a lot to take care of your physical and mental health. Check the specific questions that you marked 'False' and be sure to pay attention to changes you need to make.

**23-25:** Congratulations, you are aging well! Subtract 15 years from your chronological age for your Real Brain Age. You are presently healthy, with a youthful and productive mind. Unless things change in your life, your risk of Alzheimer's disease is extremely low.

*It's important that you review the quiz and circle any of the statements that indicate some work is needed. Talk to your doctor about your risk factors to see if treatment is indicated.*

Source: <http://dailym.ai/10mqvdC>



I



# MY BRAIN

WHAT'S GOOD FOR YOUR HEART

IS GOOD FOR YOUR BRAIN

The link between heart and brain is not that surprising when you consider how your body works. Research shows that what is good for your heart is also good for your brain. Epidemiological studies examining how often diseases develop in different groups of people and why - show that people who have cardiovascular risk factors like high blood pressure may be at greater risk for developing Alzheimer's disease and other dementias.

## THE ROLE OF CIRCULATION

Your brain is one of the most active organs in your body. Although it comprises only about two percent of your total body weight, it receives 15 to 20 percent of your body's blood supply. Supplying blood to your brain is crucial for your cardiovascular system. Blood provides the oxygen and nutrients your brain needs to function properly, and it also serves as a tool for cleaning up, removing unwanted materials from your brain. Clearly, the reliable, steady flow of blood to your brain is critical.

There are many conditions that damage your heart or blood vessels and impact the circulation of blood in your body. It makes sense that anything reducing blood flow in your body will have an impact on your high-

ly blood-dependent brain.

Let's take a look at some of the latest research that examines the connection between your heart and your brain more closely.

Research performed at Vanderbilt University Medical Center in Nashville, TN and published online on February 19, 2015 in *Circulation*, suggests that having a healthier heart, as measured by cardiac index, could help

participants in the study met the medical definition for low cardiac index, these findings are of great concern. This study marks the first time that cardiac index has been recognized as a risk factor for significant memory loss or dementia. Researchers emphasize that the findings only point to a risk factor and do not necessarily suggest a method for preventing dementia, although leading a heart healthy lifestyle certainly has the potential to help.

**YOUR BRAIN IS ONE OF THE MOST ACTIVE ORGANS IN YOUR BODY. ALTHOUGH IT COMPRISES ONLY ABOUT TWO PERCENT OF YOUR TOTAL BODY WEIGHT, IT RECEIVES 15 TO 20 PERCENT OF YOUR BODY'S BLOOD SUPPLY.**

prevent Alzheimer's disease. (Cardiac index is a measure that reflects the amount of blood the heart pumps each minute, according to the person's body size. A low cardiac index value indicates there is less blood leaving the heart.) The study found that participants with decreased heart function, i.e., a low cardiac index, were two to three times more likely to develop significant memory loss. Given that one out of three

A study by Brigham Young University in Utah, published on June 2014, found that adults with poor heart health are more likely to develop cognitive problems as they age. Researchers determined the initial cardiovascular health of the participants based on the American Heart Association Life's Simple 7 Score. This score summarizes cardiovascular health in seven key areas: smoking status, healthy diet, physical activity, body mass index, blood pressure, total cholesterol, and fasting glucose. Cognitive function was determined by a series of tests, such as learning a list of 10 words and then having to recall them several minutes later, or naming as many animals as possible in 60 seconds. They found that participants with the lowest cardiovascular health scores were more likely to show impairment on learning, memory and verbal fluency tests >>

than participants with intermediate or ideal heart health. Specifically, 4.6 percent of those with the worst heart health showed cognitive impairment four years later versus only 2.7 percent of those with intermediate heart health scores and 2.6 percent of those with ideal heart health scores.

A Mayo Clinic study released in January 2013 found that cardiac disease is associated with increased risk of non-amnesic mild cognitive impairment (MCI) such as problems with language, thinking and judgement; non-amnesic means that this form of MCI does not include memory loss but may be a precursor to later forms of dementia. Among the participants who did not have any MCI at the beginning, 669 had heart disease and 781 did not. Among the group with heart disease, 8.8 percent developed non-amnesic MCI compared to 4.4 percent of the group without heart disease. An interesting finding was that the association with cardiac disease and MCI appeared together more often among women than men.

A study published in December 2013 in the *Journal of the American Heart Association* looked specifically at the connection

## WOMEN & CARDIOVASCULAR DISEASE

Although cardiovascular disease, which includes heart disease and stroke, is often thought of as a “man’s disease,” women are affected in vast numbers as well. It is the leading cause of death for women in the world, resulting in 8.6 million deaths each year; that’s one in three female deaths. The World Heart Federation and its member organizations have spearheaded a global campaign, Go Red for Women, to ensure that everyone recognizes that cardiovascular disease is just as much a “woman’s disease”. The campaign also provide education about preventing, diagnosing and controlling heart disease and stroke in women. *(You can check out the American Heart Association’s Go Red for Women website at: <https://www.goredforwomen.org/>)*

### Take action to reduce risk

To reduce the risk of developing cardiovascular disease, women are advised to:

- ♥ stop smoking
- ♥ exercise
- ♥ maintain a healthy body weight
- ♥ eat healthy foods
- ♥ limit alcohol to one drink per day maximum
- ♥ find healthy ways to deal with stress
- ♥ have their blood pressure, cholesterol and glucose levels checked regularly



between heart and brain health in older women. It found that heart disease may put older women at higher risk for decreased brain function. Neurocognitive exams were

conducted with almost 6,500 US women aged 65 to 79 who had healthy brain function at the beginning of the study. Research discovered that postmenopausal women with heart disease or vascular disease were 29 percent more likely to experience cognitive decline over time than women without heart disease. Different types of heart disease or vascular disease were found to be associated with differing risks for declining brain function; women who had a heart attack, for example, were found to have double the risk of cognitive decline compared to women who had not.

More research is needed to completely understand the connection between heart disease and dementia. Such research is particularly important because while heart disease can be reversible, the damage caused by dementia is not. In the meantime, since we do know that heart health is a modifiable risk factor, it makes sense to engage in a heart healthy lifestyle as part of your efforts to keep your brain healthy longer.

## SYMPTOMS TO WATCH FOR

There are many similarities in the symptoms of cardiovascular disease in women and men, but there are also many important differences. Women need to be aware of the symptoms they should be watching for so they can act quickly if any are noticed. This is important, as heart disease is often “silent” in women and not diagnosed until the symptoms of heart attack, arrhythmia, heart failure or stroke appear.

**Heart disease symptoms:** chest pain or discomfort, upper back pain, indigestion, heartburn, nausea/vomiting, extreme fatigue, upper body discomfort, and shortness of breath.

**Arrhythmia symptoms:** fluttering feelings in the chest (palpitations).

**Heart failure symptoms:** shortness of breath, fatigue, swelling of the feet/ankles/legs/abdomen.

**Stroke symptoms:** sudden weakness, paralysis or numbness of the face/arms/legs especially on one side of the body, confusion, trouble speaking or understanding speech, difficulty seeing in one or both eyes, shortness of breath, dizziness, loss of balance or coordination, loss of consciousness, or sudden and severe headache.



# COUNTING SHEEP TO MIND YOUR SLEEP

Work and family pressures can get in the way of a good night's sleep. Many scientists now believe that ***chronic sleep loss does long-term harm to the brain.***

## WHY IS SLEEP SO IMPORTANT?

While researchers are still trying to determine exactly why we need sleep, we do know that it is essential for our survival. For example, animal studies have found that when rats are deprived of sleep, their life expectancy falls dramatically from two or three years to only three weeks.

Up until the 1950s, most people believed that sleep was a necessary but passive part of everyday life; a time when the body would shut down and switch off. However, modern research shows that our brains are incredibly active during sleep. At night, we move through five sleep phases that take us from light sleep to deep sleep to rapid eye movement sleep in a continuous cycle, each one lasting 90 to 110 minutes. The amount of sleep your body needs depends on many factors, but most adults seem to require seven or eight hours every night.

Without sleep, our nervous system, heart and immune system couldn't function properly. According to researchers, our bodies grow and repair cells at a faster rate while sleeping and neurons in the brain reconnect or make new connections, which consolidates memory and improves focus. Recent findings also suggest that sleep helps clean our brains of "garbage." Not those crazy thoughts but the waste proteins that accumulate during the day, such as beta-amyloid.

## ABNORMAL PROTEINS

Beta-amyloid is a sticky protein found throughout the body that gradually clumps together into what is known as amyloid plaques. Many researchers believe that high concentrations of amyloid plaques are toxic for nerve cells in the brain, and that these plaques play a key role in the development of Alzheimer's disease.

Alzheimer's is generally associated with two types of abnormal protein buildup within the brain's cerebral cortex: amyloid plaques and neurofibrillary tangles, both of which spread damage from cell to cell by causing neurons to lose their ability to function and communicate efficiently. Though these plaques and tangles do accumulate naturally with age, some scientists believe that they accumulate in greater quantities in people with Alzheimer's, while others suggest that plaques form in different patterns in those with the disease.

## SLEEP, BETA-AMYLOID PROTEINS AND ALZHEIMER'S

Beta-amyloid buildup is believed to be one of the earliest stages of Alzheimer's, appearing in the brain between 10 and 20 years before symptoms manifest. Recent findings suggest that there is a close relationship between amyloid plaques and sleep disruption, but as sleep problems are very common in people with Alzheimer's, scientists are attempting to discover whether poor sleep is a cause or an effect of the disease. >>

Several large-scale studies support the theory that disrupted sleep is a risk factor for cognitive decline. In 2012, a 15-year study by the University of California, San Francisco, assessing 1,309 elderly women found that after five years, those with nighttime wakefulness were more than twice as likely to show impaired cognitive functioning. They also discovered that women with sleep-disordered breathing, or sleep apnea, were twice as likely to develop mild cognitive impairment or dementia.

## WOMEN WITH SLEEP-DISORDERED BREATHING, OR SLEEP APNEA, WERE TWICE AS LIKELY TO DEVELOP MILD COGNITIVE IMPAIRMENT OR DEMENTIA.

Scientists at Washington University in St. Louis have shown in both human and animal subjects that sleep loss contributes to the accumulation of amyloid plaques characteristic of Alzheimer's. In a study on "cognitively normal" people between 45 and 80 years of age, they found that participants who woke up more than five times per hour were more likely to have amyloid plaque buildup compared to "more efficient" sleepers.

Another study in 2012 by Brigham and Women's Hospital in Boston followed 15,263 women, aged 70 or older, over a span of six years. The researchers found that those participants who got too little sleep (five hours or less), or even too much sleep (nine hours or more), had lower average cognition, and that consistent abnormal sleep was cognitively equivalent to two years of aging. Here, a normal night's sleep was considered to be seven hours. This study also found that too much or too little sleep was linked to amyloid plaque buildup - so it's not necessarily a case of the more sleep the better.

Questions still remain about the relationship between poor sleep and elevated beta-amyloid levels. While many studies suggest that sleep deprivation is a risk factor for the development of amyloid plaques and possibly Alzheimer's, other research has shown that the accumulation of plaques is associated with wakefulness and may in fact cause sleep disruption. It may be that this relationship is cyclical, where an initial increase in time spent awake leads to the clumping of beta-amyloid, which then leads to further sleep disruption, leading to further plaque buildup, and so on.

University of California Berkeley scientists have found compelling evidence that poor sleep - particularly a deficit of the deep, restorative slumber is a channel through which the beta-amyloid protein believed to trigger Alzheimer's disease attacks the brain's long-term memory. "Our findings reveal a new pathway through which Alzheimer's disease may cause memory decline later in life," said UC Berkeley neuroscience professor Matthew Walker, senior author of the study published in June 2015 in the journal *Nature Neuroscience*. While most research in this area has

depended on animal subjects, this latest study has the advantage of human subjects.

### HOW STRONG IS THE LINK?

Before you panic, it is estimated that up to half of adults have trouble sleeping, and that this in itself isn't necessarily a sign of Alzheimer's

disease. Many different factors can contribute to a sleepless night, such as age, stress, medications, as well as physical and mental health conditions. However, these findings do undeniably point to the fact that, for most people, getting between seven and eight hours of sleep is good for you, and that if you do experience problems sleeping, you should do your best to address them.

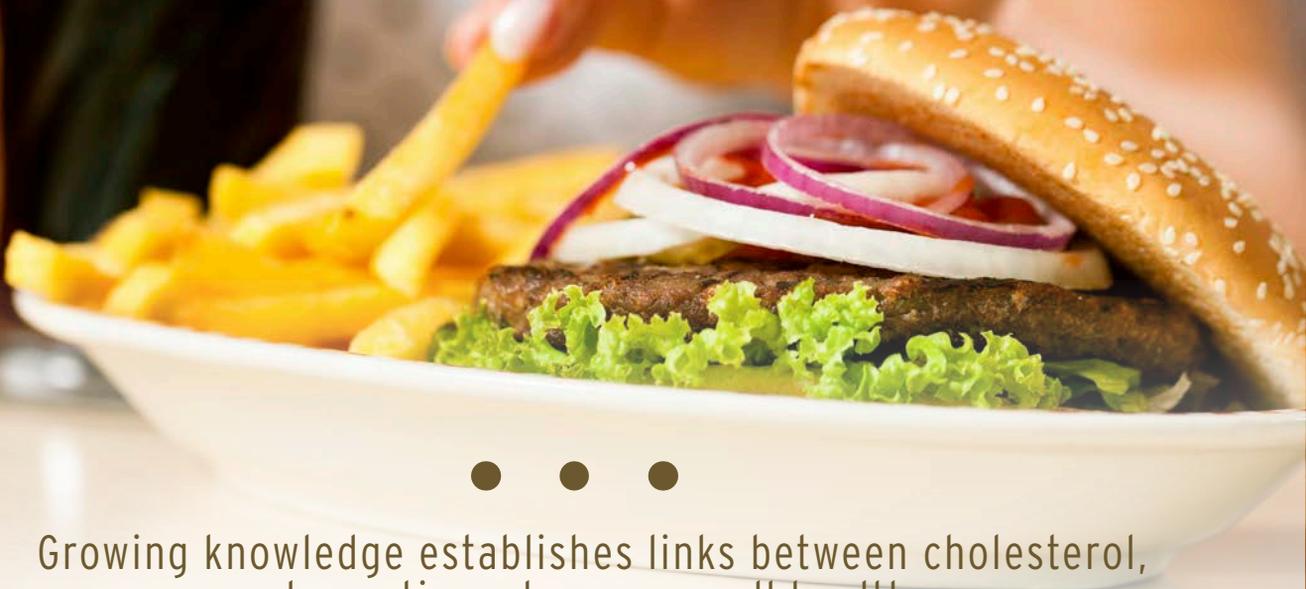
### HOW TO SLEEP BETTER

There are many techniques you can use to achieve a better night's sleep, including avoiding caffeine and alcohol at least four hours before bed, ensuring that you get regular exercise and receiving as much light exposure as possible during the day, to help your body maintain a strong biological clock.

It is also a good idea to remove sources of distraction or stimulation from the bedroom by banning laptops, phones or tablets, and to avoid watching anything too exciting before bed. Sleep specialists also recommend keeping your clock hidden to prevent you from opening your eyes to check the time, which will wake you up further. Contact your doctor if you are worried about persistent sleep problems. A medical professional will be able to recommend an appropriate treatment for your insomnia. 🌙



# ALL ABOUT CHOLESTEROL



Growing knowledge establishes links between cholesterol, dementia and your overall health

## WHAT IS CHOLESTEROL?

Cholesterol is a soft waxy substance found in your blood and cells. It is a type of lipid (fat) that comes from two sources: your liver, which makes approximately 80 percent of the cholesterol in your body, and the foods you eat, which are the source of the remaining 20 percent. Cholesterol is transported in your bloodstream in little cholesterol-protein bundles called lipoproteins, namely low-density lipoprotein (LDL) and high-density lipoprotein (HDL).

While cholesterol is often associated with health problems, it is actually a vitally important substance in your body, helping in the production of hormones and vitamin D, for example. LDL cholesterol is needed for cell growth and repair but when too much is in your body it results in plaque buildup in your arteries (known as atherosclerosis), and increased risk of heart disease; that's why LDL is sometimes referred to as "bad" cholesterol. HDL cholesterol, the one commonly referred to as "good," helps move LDL cholesterol out of the cells that line your arteries and transport it back to your liver to be excreted. Having a relatively high level of HDL cholesterol appears to be moderately protective against heart disease.

Health problems, including heart and brain diseases, arise when your cholesterol levels get out of whack. Blocked arteries resulting from high LDL-induced atherosclerosis reduce blood flow throughout the body, including to the brain. Your brain contains the most cholesterol of all your organs, 30 percent of your body's total amount. Cholesterol plays a critical role in your brain, helping to develop and maintain neuronal plasticity and function.

**CHOLESTEROL PLAYS A CRITICAL ROLE IN YOUR BRAIN, HELPING TO DEVELOP AND MAINTAIN NEURONAL PLASTICITY AND FUNCTION.**

## CHOLESTEROL AND DEMENTIA

One of the challenges with researching the cholesterol-dementia link is that many people who have unhealthy cholesterol levels also have other conditions that are associated with dementia risk such as high blood pressure and diabetes; it is complex to separate out the factors and determine their individual effects. >>

The exact relationship between cholesterol and dementia remains a partial mystery, with the limited research that has been done resulting in mixed findings. One finding has been consistent across numerous studies, though: having high total cholesterol in midlife has been found to be significantly associated with a higher risk of dementia. Furthermore, the relationship between cholesterol levels and dementia risk does not appear to remain constant over time; it changes with age. The evidence so far suggests that late-life cholesterol levels are not linked with increased dementia risk and total cholesterol levels decrease as dementia develops.

## HOW TO MAINTAIN HEALTHY CHOLESTEROL LEVELS

You do not usually experience symptoms when your cholesterol levels are unhealthy, so the only way to know if your blood cholesterol levels are normal is to have regular blood tests. The Heart & Stroke Foundation says that the Canadian guidelines recommend having your cholesterol tested if you:

- are male and over 40 years of age;
- are female and over 50 years of age and/or postmenopausal;
- have heart disease, diabetes or high blood pressure;
- have a waist measurement greater than 102cm (40 in.) for men or 88cm (35 in.) for women;
- smoke or have smoked within the last year;
- have erectile dysfunction; or
- have a family history of heart disease or stroke.

Since there isn't a universally "ideal" level for any type of cholesterol, your doctor will consider the various measures obtained in your cholesterol test, as well as your risk factors, medical history and present health when interpreting the results.

If your cholesterol levels are considered unhealthy, your doctor will provide treatment advice that might include lifestyle changes such as: reducing your intake of saturated and trans fats, engaging in regular physical activity, maintaining a healthy body weight, refraining from smoking and limiting alcohol consumption. In some cases, when lifestyle changes prove to be insufficient to keep your cholesterol levels in check, your doctor might prescribe medication. 🍷

## LATEST RESEARCH FINDINGS ON CHOLESTEROL & BRAIN HEALTH

*Research on the relationship between cholesterol and the brain is heading in many interesting directions. Here's a summary of some of the latest findings:*

**Unhealthy cholesterol levels** may be causing formation of amyloid plaque in the brain. Research conducted by the University of California Davis Alzheimer's Disease Center, published in December 2013 in *JAMA Neurology*, found that unhealthy patterns of cholesterol (i.e., high levels of LDL and low levels of HDL) could be directly causing higher levels of amyloid plaque in the brain, a known hallmark of Alzheimer's disease. More research is needed to determine exactly how cholesterol is affecting the amyloid deposits in the brain.

**Raising HDL cholesterol** may lower risk of developing Alzheimer's disease. A study published in the December 2010 issue of *Archives of Neurology* by investigators at Columbia University College of Physicians and Surgeons, looked at the link between HDL cholesterol and Alzheimer's disease among 1,130 elderly Manhattan residents. They discovered that having low levels of HDL cholesterol (the "good" one) raised participants' risk of developing Alzheimer's disease. Previous studies into the relationship between HDL cholesterol and Alzheimer's disease had inconsistent results, with some finding an association but others finding none. The researchers believe this study may provide a more accurate account of the relationship because it followed subjects for a longer period of time, an average of four years. Though the findings need to be confirmed through further study, this research points to the possibility that increasing your HDL cholesterol level can lower your risk of developing Alzheimer's disease.

**Cholesterol causes cells to divide incorrectly.** Researchers at the Linda Crnic Institute for Down Syndrome and the University of Colorado School of Medicine, in a study published in the April 2013 online journal *PLOS ONE*, found that cholesterol, particularly in the LDL form, caused cells to divide incorrectly and distribute their already duplicated chromosomes unequally to the next generation. The result was an accumulation of defective cells with the wrong number of chromosomes. Of particular interest was the discovery of cells that carried three copies of chromosome 21, the chromosome that encodes the amyloid peptide that is the key component of amyloid plaque associated with Alzheimer's disease. Previous studies had shown that up to 10 percent of cells in an Alzheimer's patient, including neurons in the brain, have three copies of chromosome 21 instead of the usual two. Other research, at Leipzig University, Germany, found that during autopsy 90 percent of the cell death in brains of Alzheimer's patients was due to the creation and selective loss of neurons with the wrong number of chromosomes. Future research to identify the specific role cholesterol plays in this irregular cell division could lead to completely new therapies for the many human diseases that show signs of defective cell division, including Alzheimer's disease.



# DEPRESSION & DEMENTIA: A COMPLEX RELATIONSHIP

What research tells us about the treatment & prevention of both



*Although scientists have known for a long time about an association between depression and dementia, the exact nature of that complex relationship remains unclear. People who are depressed often, but not always, go on to develop dementia and many people with dementia are depressed. (In fact, according to the Alzheimer's Association, as many as 40 percent of people with Alzheimer's disease also experience depression.)*

## AS MANY AS 40 PERCENT OF PEOPLE WITH ALZHEIMER'S DISEASE ALSO EXPERIENCE DEPRESSION

*Research has revealed some information about why depression and dementia often occur together but the results have been inconsistent, and much remains to be learned. So far, there are three main theories about the nature of the depression-dementia relationship. >>*

### 1. Depression may be a risk factor for dementia,

i.e., depression comes first and potentially contributes to later dementia.

### 2. Depression may be an early sign of dementia,

i.e., dementia comes first and sometimes contributes to subsequent depression.

### 3. Depression and dementia may share common cause(s),

i.e., there may not be a direct link between the two, but there may be other, yet undetermined, factors that increase risk for both depression and dementia.

## Let's examine each of these theories in more detail.

### 1. Depression is a potential risk factor for dementia

Research published in *Gerontology* in 2000 reviewed existing epidemiological evidence and concluded that "there is sufficient evidence to take seriously the possibility that depression is a risk factor for dementia and cognitive decline."<sup>1</sup> In the decade and a half since then, new studies continue to point to the possibility that depression is a risk factor for dementia. For example:

A meta-analysis of 23 previous studies that followed almost 50,000 older adults over a median lifespan of five years was published in 2013 in the *British Journal of Psychiatry*. The report concluded that late-life depression likely contributes to dementia, although it can't be confirmed, based on the findings, that late-life depression causes dementia. The researchers think that depression is toxic to the brain.

A study published in *Neurology* in July 2014 reported that depression is a risk factor for dementia; furthermore, it found that the more symptoms of depression one suffers, the more rapidly thinking and memory skills decline. The study authors emphasized that while they did find an association between depression and dementia, their findings did not prove a cause-and-effect relationship.

### 2. Depression is a potential early sign of dementia

A study published in the March 2013 issue of *JAMA Neurology* suggests that depression in older adults may be an early symptom of dementia, rather than a separate risk factor for it. The research looked at 2,160 New Yorkers aged 65+ and found that late-life depression accompanies cognitive decline but does not precede it. The results suggest that depression develops as one experiences a decline from normal cognition to dementia. Some experts have hypothesized that depression occurs as an emotional reaction to the challenging impacts of dementia such as impaired thinking and unreliable memory.

### 3. Depression and dementia might share common cause(s)

Just because depression and dementia are often both present simultaneously in a patient does not mean that the two conditions are directly related. It's possible that a third, separate factor increases risk for both depression and dementia by affecting brain chemistry or structure in ways found in both conditions. One theory is that vascular disease - which impairs blood circulation in the body - could be that third factor. In particular, cerebrovascular disease might

be the key. Cerebrovascular disease is a group of conditions that impede or block the flow of blood specifically to the brain. It is easy to imagine how impaired circulation of blood to the brain could cause changes that lead to numerous negative side effects including dementia and depression.

#### The Effect of Life Stage

The depression-dementia relationship is perhaps even more complex than these three theories would suggest. A study published in the May 2012 issue of *Archives of General Psychiatry* looked at the possibility that the nature of the relationship varies based on the type of dementia and when in one's lifetime depressive symptoms are experienced. The results suggest that depression occurring for the first time in late-life may be an early symptom of dementia, particularly Alzheimer's disease, while chronic depression (occurring in mid and late-life) may be a reflection of long-term changes in blood flow to the brain that increase risk of vascular dementia.

Clearly, more research is needed, particularly long-term studies are necessary in order to further clarify the relationship between depression and dementia. In the meantime, there is action you can take to be proactive about your mental and cognitive health.

## Taking Action for Your Health

**DIAGNOSIS** Since depression and dementia share such a complex, yet not entirely understood, relationship, it's no surprise that diagnosing an older person who is showing signs of cognitive decline and/or depressive symptoms is a complex undertaking. Similar symptoms can make it difficult to tell the difference between depression and dementia. Examples of such symptoms include apathy, loss of interest in hobbies, social withdrawal, concentration problems and memory impairment.

Just as there is no single test to diagnose dementia, there is also no single test to detect depression. However, the National Institute of Mental Health in the United States has established a formal set of guidelines for diagnosing depression in someone known to have Alzheimer's disease. The criteria for these tests are similar to general diagnostic standards for major depression but vary in that they reduce the emphasis on verbal expression and take into consideration irritability and

social isolation.

Assessing a dementia patient for possible depression requires a thorough evaluation by a medical professional and may best be performed by a geriatric psychiatrist who specializes in recognizing and treating depression in older adults.

#### TREATMENT

##### **Treating Early Depression on its Own:**

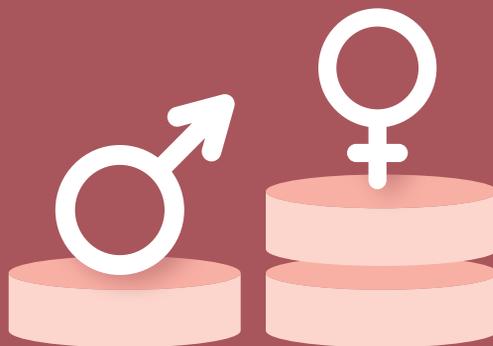
As the exact nature of the relationship

## Depression is Different in Women and Men

*Adding to the complexity of the depression-dementia link is the reality that women and men differ when it comes to depression. For starters, women are more likely to experience depression with about twice the risk as men. Other differences include:*

- Women may be more likely than men to become depressed after experiencing a major stressful situation such as loss of a loved one or job.
- Depression in women is more likely to be diagnosed early. Mild depressive symptoms in men may not be recognized by healthcare professionals or family members, resulting in the development of more severe depression before it is noticed. With the longer delays before diagnosis and treatment, depressed men are more likely to commit suicide than depressed women.
- Women are more likely than men to experience depression in combination with other disorders such as panic disorder, obsessive-compulsive behaviour, anorexia or bulimia.
- When feeling depressed, women are more likely than men to ruminate (dwell on negative feelings and rehash negative past events.) In turn, rumination tends to make people feel worse. Depressed men are more likely to distract themselves, which can help to ease the negative feelings.
- Depressed men are more likely than women to abuse alcohol or illegal drugs. They may also try to mask their feelings of sadness by watching TV or working excessively, or engaging in risky behaviours like gambling and unsafe sex.
- Depression is more apt to be expressed as anger and irritability in men than women.
- Early research shows that there may be differences in how women and men respond to antidepressants.
- Having a position of authority at work appears to affect women and men differently. One study found that women who have job authority, i.e. the responsibility to hire, fire and influence pay - showed significantly more symptoms of depression than women who did not have job authority. Men, however, experienced the reverse: those with job authority experienced fewer symptoms of depression than men without such responsibility and power. Researchers suggest that this difference could be the result of negative stereotypes women face when displaying confidence and assertiveness, whereas men are usually not judged negatively for displaying those characteristics.

(Incidentally, women and men differ when it comes to dementia, too. That's why Women's Brain Health Initiative was founded - to raise awareness of the differences and address the lack of research focused on women's brains.)



between depression and dementia remains a mystery, it is not clear whether treating depression could help decrease the risk of developing dementia. Research does raise hope, however, that adequate treatment of midlife depression may reduce later dementia risk, particularly vascular dementia. For this reason, it makes sense to pursue treatment of depressive symptoms when they appear in order to reduce the risk of any other health risks such as dementia, as well as to improve quality of life and relieve suffering.

**Treating Dementia Patients Who Are Depressed:** According to the Alzheimer's Association, the most common treatment for depression in Alzheimer's patients involves "a combination of medicine, counselling and a gradual reconnection to activities and people that bring happiness." They warn that simply telling a depressed Alzheimer's patient to "cheer up" or "snap out of it" is not helpful; these individuals usually need a lot of support, reassurance and professional help to address depressive symptoms.

**PREVENTION** In addition to identifying and treating depressive symptoms, healthy lifestyle habits are also important for reducing the risk of both depression and dementia. Healthy choices that are known to help with treatment of depression, including good nutrition, regular exercise and participating in engaging social activities - are also good for staving off dementia. It turns out that the old adage is true: what's good for your mental health is good for your brain, too. 🧠

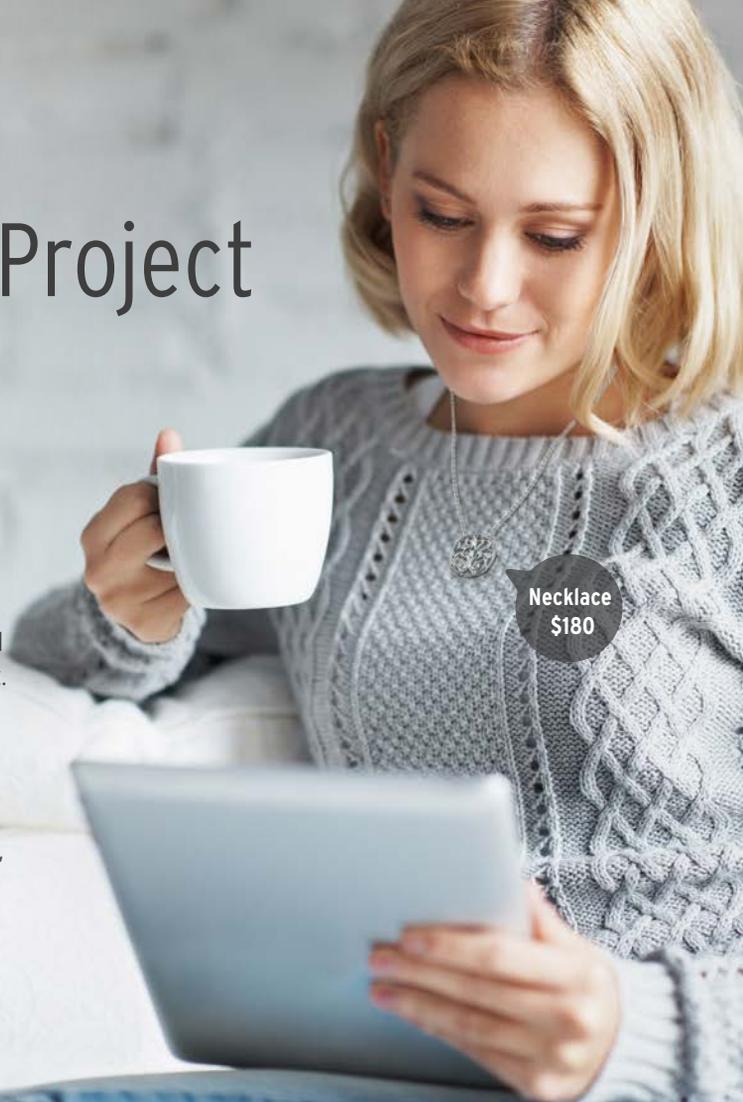
# The HOPE-KNOT Project

## TO COMBAT BRAIN-AGING DISEASES THAT AFFECT WOMEN

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

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.**



**Aromatherapy**  
\$40



**Sterling Pendant & Chain**  
\$180



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



**Sterling Cufflinks**  
\$295

### 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.

Women's Brain Health Initiative Hope-Knots can be purchased online at the Hope-Knot Shop [HOPEKNOT.MYSHOPIFY.COM](http://HOPEKNOT.MYSHOPIFY.COM) or by calling toll free 1-888-927-2011.



**Leather Wrist Bag**  
\$120

For more Hope-Knot gift ideas,  
visit [HOPEKNOT.ORG](http://HOPEKNOT.ORG)

# FEAR FACTORS



## DO YOU KNOW THE DEMENTIA FACTS? How do you score?

T F

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. There are many different types of dementia.                         |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Dementia is a normal part of aging.                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. People under 65 can get Alzheimer's.                                |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Alzheimer's disease doesn't run in my family, so I won't get it.    |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Scientists know exactly what causes Alzheimer's Disease.            |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. There are things I can do to reduce my risk of getting Alzheimer's. |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. There is a cure for Alzheimer's disease.                            |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. If I'm having trouble with my memory, I must have dementia.         |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Early diagnosis of Alzheimer's disease is important.                |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. There is a single test that can show if someone has Alzheimer's.   |

*Despite an abundance of existing research, there is much we still don't know about dementia. This lack of knowledge can create an environment of fear. A 2012 survey by the Marist Institute for Public Opinion attempted to measure that level of fear among Americans; they found that 44 percent of respondents said Alzheimer's is the chronic disease they fear the most. In particular, the most feared aspect of the disease was being unable to care for oneself, cited by 68 percent of respondents, followed by losing memory of life and loved ones, cited by 32 percent.*

*Some of the fear around dementia, and Alzheimer's disease in particular, stems from lack of knowledge when the truth is there is much we do know about this condition. Take this quiz to see how much you know about dementia and increase your knowledge. After all, knowledge is one of the best tools for alleviating feelings of fear and anxiety, and empowering yourself to take action, if necessary, for yourself or on behalf of a loved one. >>*

## 1. THERE ARE MANY DIFFERENT TYPES OF DEMENTIA.



**TRUE.** Dementia is an umbrella term used to describe conditions in

which various brain functions such as memory, thinking, language, planning and personality decline over time. There are many different kinds of dementia, but Alzheimer's disease is by far the most common; between 60 percent and 80 percent of people with dementia are thought to have Alzheimer's disease. The next most common form is vascular dementia, which occurs when brain cells are deprived of oxygen; it accounts for up to 20 percent of dementia cases. Sometimes Alzheimer's disease and vascular dementia occur at the same time; this is referred to as "mixed dementia." Other diseases and syndromes that are considered dementias include: frontotemporal dementia (FTD), Lewy Body dementia, Huntington's disease, Creutzfeldt-Jakob disease, Parkinson's disease, and Wernicke-Korsakoff syndrome.

## 2. DEMENTIA IS A NORMAL PART OF AGING.



**FALSE.** Dementia is not a normal part of aging.

If it were, then all older

adults would have it, which isn't the case. Approximately half of the people aged 85+ are thought to have Alzheimer's disease (the most common form of dementia). Many seniors, however, live into their 90s or higher without ever developing dementia.

## 3. PEOPLE UNDER 65 CAN GET ALZHEIMER'S DISEASE.



**TRUE.** Although Alzheimer's disease is far more common among the

elderly, it does occasionally affect younger people. About five percent of diagnosed Alzheimer's cases are among people under 65 years old; these patients are said to have early-onset or younger-onset Alzheimer's disease. Sometimes people in their 30s and 40s are also affected.

## 4. ALZHEIMER'S DISEASE DOESN'T RUN IN MY FAMILY, SO I WON'T GET IT.



**FALSE.** Family history is only one of many risk factors for Alzheimer's disease, so even if no one in your family has ever had the disease that does not mean you are necessarily immune. Research shows that having a parent, sibling or child with Alzheimer's disease, increases your risk of developing the disease, however, having increased risk does not necessarily mean you will develop Alzheimer's.

## 5. SCIENTISTS KNOW EXACTLY WHAT CAUSES ALZHEIMER'S DISEASE.



**FALSE.** Science has not yet determined a precise cause of Alzheimer's disease.

**SCIENTISTS BELIEVE THAT MOST PEOPLE GET ALZHEIMER'S DUE TO A COMPLEX COMBINATION OF GENETIC, LIFESTYLE & ENVIRONMENTAL FACTORS THAT IMPACT THE BRAIN OVER TIME.**

At this point in time, experts have only begun to identify risk factors for the disease, not a definitive cause.

## 6. THERE ARE THINGS I CAN DO TO REDUCE MY RISK OF GETTING ALZHEIMER'S DISEASE.



**TRUE.** Genetic predisposition sometimes plays a role in Alzheimer's disease

but research shows that there are other factors involved, many of which are within your control to affect. These are known as modifiable risk factors. It seems that anything that is good for your heart health will also help prevent dementia. Examples include regular exercise, healthy nutrition, and well-controlled blood pressure and cholesterol. Staying socially active and keeping your brain engaged through activities like completing crossword puzzles, reading and learning new skills are also thought to lower

the risk or delay the onset of dementia.

## 7. THERE IS A CURE FOR ALZHEIMER'S DISEASE.



**FALSE.** Currently, there is no cure for Alzheimer's disease and a cure is not expected in the foreseeable future. Much research has been done but much more is needed. The publisher of this magazine, **Women's Brain Health Initiative**, raises funds for research that focuses specifically on combating brain-aging diseases that affect women (because an astounding 70 percent of new Alzheimer's patients will be women). For more information, or to donate, visit [www.womensbrainhealth.org](http://www.womensbrainhealth.org). It is our hope that more research can eventually lead to a cure.

## 8. IF I'M HAVING TROUBLE WITH MY MEMORY, I MUST HAVE DEMENTIA.



**FALSE.** A certain amount of forgetfulness is normal as you age and almost

40 percent of people aged 65+ experience some form of memory loss. However, memory loss itself does not necessarily mean you have, or are developing, dementia. Sometimes dementia-like symptoms are caused by treatable conditions such as depression, drug interactions, excess use of alcohol, or vitamin deficiencies. Here are some examples of signs of normal aging versus potential dementia, to help you understand the differences. Please note that this is not meant to serve as a diagnostic tool.

**Normal aging might include** not being able to recall details of a conversation or event that took place a year ago, not being able to remember the name of an acquaintance, or occasionally having trouble finding words.

**Signs of potential dementia might include** not being able to recall details of recent conversations or events, not recognizing or knowing the names of family members, and frequent pauses and substitutions when finding words.

Talk to your family doctor if you are worried about your memory.

## 9. EARLY DIAGNOSIS OF ALZHEIMER'S DISEASE IS IMPORTANT.



**TRUE.** Alzheimer's patients benefit from early diagnosis in many ways, for example:

- Doctors can look for and treat reversible causes of cognitive impairment, including medications and other diseases.
- There are treatments that, if started early, help with some of the more difficult symptoms of dementia.
- Patients can be actively involved in their own healthcare and personal decisions, and begin long-range financial planning to address future needs as they become more dependent.
- It's a chance to focus on healthy eating, physical activity, social interac-

tion and stimulating brain activity to help delay the disease's progress.

- Patients may have the opportunity to participate in clinical trials of new treatments.
- The anxiety felt by family members can be reduced once they understand the cause of the patient's symptoms.
- Since people with dementia can live meaningful, productive lives for many years after an early diagnosis, finding out about the disease in the early stages means there's still time for the patient to focus on what's most important to them, and they can do special things they've always wanted to do, such as travel, while they still can.

It is frightening that worldwide as many as 28 million of the 36 million people with dementia have yet to be diagnosed. Early diagnosis is so important that the Alzheimer's Society of Canada has an entire website dedicated specifically to the topic: <http://www.earlydiagnosis.ca>.

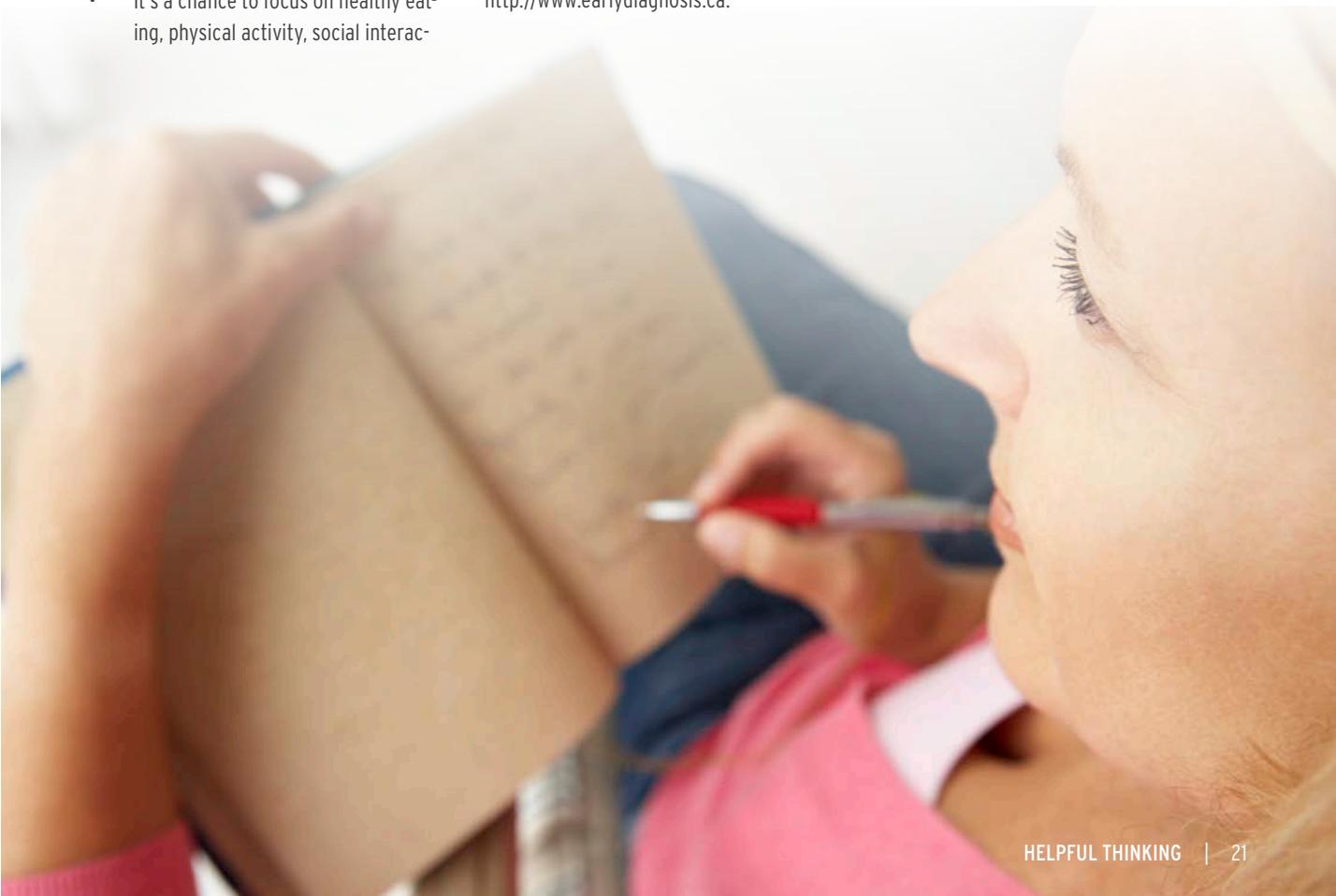
## 10. THERE IS A SINGLE TEST THAT CAN SHOW IF SOMEONE HAS ALZHEIMER'S DISEASE.



**FALSE.**

**THERE IS NO SINGLE TEST THAT CAN SAY WITH 100 PERCENT CERTAINTY,**

while someone is alive, that they have Alzheimer's disease. Absolute confirmation of the diagnosis requires examination of brain tissue during an autopsy. However, patients can be diagnosed with up to 90 percent accuracy while alive through a medical evaluation that includes multiple components. This evaluation typically includes a thorough medical history, mental status testing, a physical exam, a neurological exam, and tests such as blood tests and brain imaging to rule out any other potential causes of dementia-like symptoms. 🧠





**Dr. Illana Gozes** is a Professor of Clinical Biochemistry, the Lily and Avraham Gildor Chair for the Investigation of Growth Factors at Tel Aviv University. Professor Gozes is the Editor-in Chief of the *Journal of Molecular Neuroscience*, heads the Tel Aviv Chapter of the Society for Neuroscience, serves as a member of the Israel Brain Technologies (Council) and the Israel Alzheimer's and Dementia Association Councils, is an Associate Editor on the *Journal of Alzheimer's Disease* and is an Ex-President of the Israel Society for Neuroscience (ISFN). Professor Gozes was the Founding Scientist and a Director at Allon Therapeutics Inc., Vancouver, BC, and now also serves as Chief Scientific Officer of Coronis Partners.



# UP CLOSE & PERSONAL

## TAKING GENDER INTO CONSIDERATION



In a recent interview with Dr. Ilana Gozes of Tel Aviv University's Sagol School of Neuroscience, Adams Super Center for Brain Studies, Sackler Faculty of Medicine, Women's Brain Health Initiative asked the question that is always at the forefront of our minds - Does Sex Matter?

For more than a decade, Dr. Gozes and her team have been researching how ADNP, or activity-dependent neuroprotective protein, a major regulatory gene in humans, and its NAP derivative, affects a series of age- and gender-related conditions. Gozes is one of the world's greatest experts in the area.

In a study published in early 2015, Gozes and the TAU team demonstrated how ADNP affects Alzheimer's disease and autism and provides insights into how the gene could affect males and females differently. The study examined the behavioural response of male and female mice - both ADNP altered and normal - to different cognitive challenges and social situations. To do so, the team removed one copy of the ADNP gene from some mice, and then examined their respective responses to unfamiliar objects, odors and other mice.

The results revealed sex-specific learning and memory differences in the mice. In the male mice, the lack of one copy of ADNP caused deficiencies in object recognition and social memory, typical of autistic behavior. However, for females, the removal of one gene copy was associated only with deficits in social memory. Sex-dependent differences in brain expression of the major risk gene for Alzheimer's disease and for a gene associated with autism were also observed in these mice, with females, associated with Alzheimer's disease and males with autism.

The researchers concluded there was a gender-related - and age related - difference in the effect of ADNP on mouse behaviour. The next step, of course, is to expand the study and extend it to human clinical trials. "This study emphasizes the need to analyze men

and women separately in clinical trials to find cures for diseases, because they may respond differently," she explained. "Male and female mice may look the same and their brains may look the same, but they are not. When the expression ADNP is different, it may cause different behaviours and different cognitive abilities."

In a previous study looking at brain-specific molecules encompassing aspects from genetic engineering to behavior and memory, Dr. Gozes was the first to isolate and clone the gene VIP (vaso-active intestinal peptide) a small protein found in the brain. Her study found that the expression of VIP is reduced in the aging brain resulting loss of memory, decreased learning abilities and inhibition of sexual function. We asked Dr. Gozes if this was true in both genders.

"I would hypothesize yes for both genders, but probably not exactly the same," said Gozes.

Not exactly the same. What does that mean for you and me?

"Women's health isn't the same as men's. Our brains do not develop in the same way and we can no longer assume that we are created equally." Said Dr. Gozes. She went on to explain that the National Institute of Health in the U.S. is grasping the situation and now requires studies to take gender into consideration, to ensure that clinical trials include half the population during trials not in retrospect and that assumptions, which no longer hold true, are revisited.

Dr. Gozes said the next step is for these guidelines to filter down to healthcare professionals. "This is the leading edge of precision and personalized medicine - the concept of drugs that are personalized." It will no longer be acceptable for physicians to overlook gender differences. They will have to ask questions regarding the impact of gender on drug dosage, prevalence of disease, and disparity in health development. 🌐

# GRANDMA... DO YOU KNOW WHO I AM?

Discussing Dementia With Children



**A**lmost 36 million people in the world have Alzheimer's disease or a related dementia and most of those individuals have young people in their lives that will be impacted as the disease runs its course. Although *it may be tempting to try to shield young ones from difficult news*, experts agree it's best to be direct and honest with children about dementia so they can understand what is happening and why.

It can be difficult for children to understand that someone has an illness when that person still looks the same. But children are often quick to notice changes in behavior, such as Grandma not recognizing family members anymore, Grandpa being irritable or even rude, or a Great Aunt repeating the same things over and over again. Sometimes the loved one with dementia may behave just as he or she always used to, and then suddenly change. This unpredictability can be very upsetting to children. That's why it's important to talk to children openly about what is going on and not try to hide anything.

## CANDID CONVERSATIONS

When discussing dementia with children, provide an explanation of the disease and disclose what might be expected as it progresses. Explain the situation calmly and clearly, using age-appropriate terms. Some of the key points to address in your conversation include:

**“Dementia is an illness that affects the brain, destroying the parts that control memory, thinking and feeling. It causes people to become more forgetful and at this time, it has no cure.”**

**“Lots of older people suffer from dementia, but it's not contagious and not all older people have it.”**

**“You might have noticed that Grandma (for example) has been behaving differently. It is the illness causing those changes and is not intentional. (Providing specific examples of the types of behavior changes that have occurred or might be coming can help illustrate specifically what you mean, e.g. she forgets your name, she doesn't know where she is, she cries a lot, she becomes angry easily.)”**

**“Grandma's behavior will change from day to day and more changes are likely to happen. Some days will be easier than others.”**

**“Grandma still loves you a lot and always will.”**

Ask if the child has any questions and be prepared to answer openly and honestly.

Encourage and embrace any feelings he or she expresses related to the situation.

## CHILDREN REACT DIFFERENTLY TO THIS TYPE OF NEWS, RANGING FROM ANGER, TO TEARS, TO APPARENT INDIFFERENCE.

Their immediate reaction and feelings may shift over time as the information has time to sink in. Children who have a loved one with dementia often experience a wide



range of emotions that might include grief, sadness, anxiety, fear, irritation, embarrassment, boredom, guilt, confusion and anger.

Be open to discussing the situation more than once. Depending on the age of your child and their personality, you may need to repeat your explanations, and address new questions as they arise over time. As difficult as these conversations might be, remember that it is immensely helpful for children to know what to expect so that they are better prepared to respond positively to any new behaviors that their loved one may exhibit.

## VALUABLE VISITS

If your child is close to an individual with dementia, it is helpful to nurture that relationship. Seeing that their loved one is well taken care of and comfortable will reassure your child, and it can be a source of deep satisfaction for your child to play a role in that. It can also benefit the dementia patient to have enriching interactions with

children. Look for simple, pleasurable activities the child and dementia patient can do together to stay connected and keep their bond strong. Some examples to consider are going for a walk, playing games, listening to music or making a scrapbook together. Of course, these activities will need to change as the dementia progresses.

Understanding dementia can be very empowering for children, helping to minimize their fears. Once your child understands what is going on, he or she can be prepared about what to expect during visits with their loved one, and enjoy their special time together. Even if the visit is soon forgotten, the joy experienced in the moment makes the time spent together meaningful and beneficial.

## RELEVANT RESOURCES

There are numerous resources available to help children learn about dementia. Some can be found for free online such as the Kids & Teens section on the Alzheimer's Association website ([http://www.alz.org/living\\_with\\_alzheimers\\_just\\_for\\_kids\\_and\\_teen.asp](http://www.alz.org/living_with_alzheimers_just_for_kids_and_teen.asp)), which includes a helpful introduction as well as links to videos, fact sheets and other websites. There are also many fiction and non-fiction books for different ages that may help children and teens cope when a loved one has dementia; a comprehensive list of books can be found at: <http://www.nia.nih.gov/alzheimers/resources-children-and-teens-about-alzheimers-disease>.

A great resource for the whole family is a 30-minute HBO documentary called 'Grandpa, Do You Know Who I Am?', which Maria Shriver helped create. It can be viewed online for free at: <http://www.hbo.com/alzheimers/grandpa-do-you-know-who-i-am.html>. 



(L-R) Lynn Posluns, Marie-Josée Lamothe (Managing Director - Branding, Google Canada), Janice Fukakusa (CAO & CFO, RBC), Kimberley Newport-Mimran (President & Creative Director, Pink Tartan), Wendy Freeman (President, CTV News) *Photo: Tom Sandler*

Another exciting year for WBHI. Founder & President Lynn Posluns continues to share the women's brain health story at events in Canada and the U.S.

## THE EXECUTIVE BRAIN: LIFE LESSONS FROM SMART WOMEN

(above) Oct, 2014 | (below) March, 2015

# BRAIN BUZZ

WOMEN'S BRAIN HEALTH INITIATIVE ON THE MOVE



(L-R) Ellen Moore (President & CEO, Chubb Insurance Co.), Michèle Maheux (Executive Director & COO, TIFF), Jeanne Beker (Journalist, Author & Fashion Entrepreneur), Amanda Lang (Senior Business Correspondent, CBC News and Anchor, The Exchange with Amanda Lang) *Photo: Arthur Mola*



Alexandra Richards



Dr. Pauline Maki & Carolyn Lawrence



Kelly Rutherford



Trudie Styler



Dr. Lisa Airan, Robbie Myers & Wendi Murdoch



Lindsay Ellingson & Constance Jablonski

NYC LAUNCH  
Donna Karan's Urban Zen  
March, 2015



Marisa Berenson



Martha Stewart



Ivanka Trump & Lynn Posluns



# MINDFULNESS MEDITATION

Calm Your Mind To Protect Your Brain



**M**editation has been shown to provide numerous benefits for people of all ages. Among other things, it appears to help with a variety of physical and psychological conditions including stress, pain, anxiety, depression, high blood pressure and sleep problems.

Although there are many kinds of meditation, this article focuses primarily on one of the most common forms, mindfulness meditation.

**MINDFULNESS MEDITATION TRAINS YOUR ATTENTION TO FOCUS ON THE PRESENT MOMENT AND NOT GET CARRIED AWAY BY THOUGHTS OF THE PAST OR WORRIES ABOUT THE FUTURE.**

One of the best known and most studied form of mindfulness meditation is Jon Kabat-Zinn's Mindfulness-Based Stress Reduction (MBSR) program. This eight-week intensive training has participants meet once each week to learn new techniques and encourages them to practice at home in between sessions.

## **HOW MEDITATION CHANGES YOUR BRAIN**

Research has not yet identified the exact reason behind the numerous benefits of meditation, but it seems that physical changes in the brain are likely playing a role.

Multiple studies have found that meditation impacts grey matter in certain regions of the brain and may play a role in slowing down the age-induced thinning of the frontal cortex. For example, a study by Harvard-affiliated researchers at Massachusetts General Hospital used MRI scans to document changes in the brain's grey matter in response to meditation. The results, published in January 2011 in *Psychiatry Research: Neuroimaging*, showed that

**MEDITATORS HAD INCREASED GREY MATTER DENSITY IN THE HIPPOCAMPUS, AN AREA OF THE BRAIN KNOWN TO BE IMPORTANT FOR LEARNING AND MEMORY.**

Furthermore, decreased grey matter density was found in the amygdala, which is known to play an important role in anxiety and stress.

A 2009 review of the neuroprotective effects of meditation, published in the *Annals of the New York Academy of Sciences*, found that meditation may help to elevate levels of Brain Derived Neurotrophic Factor (BDNF). BDNF is a protein found in the brain that helps support survival of existing neurons and encourage growth of new neurons and synapses. It is known to be important for long-term memory.

Research reported in 2010 in the *Journal of Alzheimer's Disease* found similar results. In this study, a simple meditation program practiced 12 minutes a day over 8 weeks by cognitively impaired participants, resulted in significant increases in cerebral blood flow in the frontal cortex, a part of the brain that aids in attention and executive function. (Executive function refers to the management of many cognitive processes, including working memory, reasoning, task flexibility, problem solving, planning and execution.)

Researchers at the University of California - Los Angeles suggest that one possible effect of repeatedly focusing one's attention during meditation is increased brain connectivity. The results of their study, published in the May 2011 issue of *Neuroimage*, indicated that functional MRI scans of participants who had finished eight weeks of MBSR training showed stronger connections in several regions of their brain. This was especially true for the regions associated with attention, as well as auditory and visual processing, when compared to control group participants who did not complete the training.

**THE ROLE OF STRESS**

While research performed to date does not provide a definitive explanation of why meditation affects the brain in the above ways, researchers from Carnegie Mellon University suggest that mindfulness meditation may influence health through stress reduction. They explain, in the December 2014 issue of *Current Directions in Psychological Science*, that when someone experiences stress, activity in their prefrontal cortex (responsible for conscious thinking and planning) decreases, while activity in the amygdala, hypothalamus and anterior cingulate cortex (regions associated with the body's stress response) increase. It appears that mindfulness meditation reverses these patterns. When confronted with stress, prefrontal activity increases, helping to regulate and turn down the body's stress response.

One possible explanation could be that by helping to reduce stress, meditation decreases the amount of cortisol secreted, a decrease that could have neuroprotective effects. Cortisol is a hormone known to wreak havoc in the body when released in high quantities and its release is a documented response to chronic stress. >>



## MINDFULNESS MEDITATION FOR THE MEMORY-IMPAIRED

A limited amount of research has been performed that studies the impacts of mindfulness meditation on people experiencing cognitive decline. The studies that have been performed so far indicate that

### MINDFULNESS TRAINING IS BENEFICIAL FOR INDIVIDUALS WITH MCI OR DEMENTIA, PARTICULARLY THOSE IN THE EARLY STAGES, AS WELL AS THEIR CAREGIVERS.

Below are highlights from some of those studies:

 A study described in *Evidence Based Complementary Alternative Medicine* in 2012 looked at the effects of an eight-week meditation training program among adults experiencing cognitive decline and their caregivers. The intervention was found to be effective for both groups, resulting in numerous positive effects, including reducing perceived stress and improved sleep, mood and memory.

 A study published on April 1, 2014 in *Journal of the American Geriatrics Society* tested the effect of teaching standard Mindfulness-Based Stress Reduction (MBSR) to adults aged 55-90 who had mild cognitive impairment (MCI). The research determined that adults with MCI can safely participate in a MBSR program and seem to experience benefits from doing so. In qualitative interviews, participants described experiencing improved well-being and interpersonal skills, as well as decreased reactivity to stress.

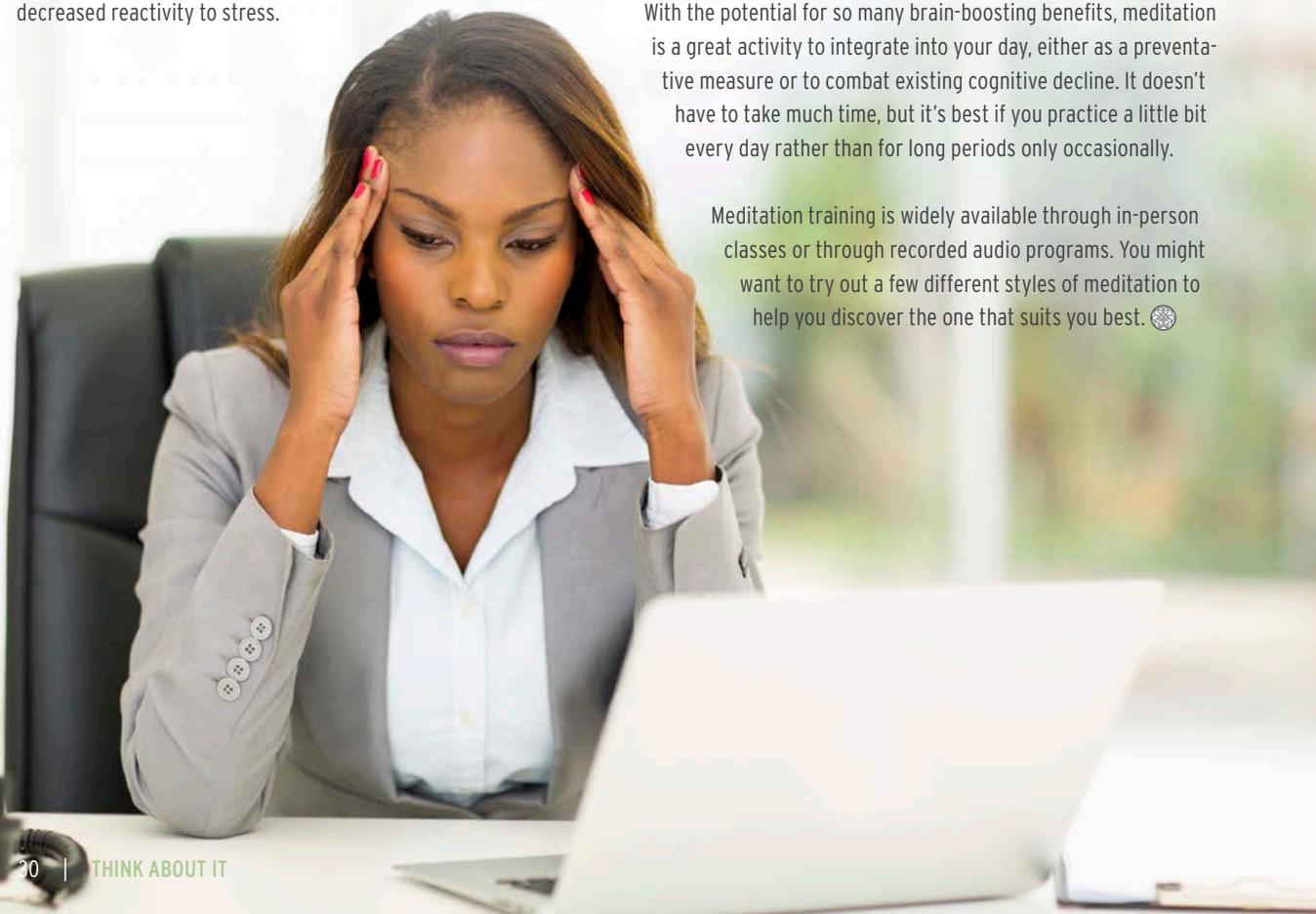
 A recent study, conducted by *Innovations in Dementia & Positive Ageing Associates* and published in the May/June 2014 issue of *The Journal of Dementia Care*, also worked with dementia patients using the program. In this study, dementia patients and caregivers participated in the standard protocol. The researchers concluded that the program worked best for people in the earlier stages of dementia, who experienced improved cognitive function, regulation of emotion, sense of self and interpersonal relationships, as well as reduced anxiety and pain. Participants who were in the later stages of dementia sometimes struggled with the cognitive exercises involved in the standard approach, so the researchers concluded that future studies with advanced dementia patients should use a modified version of the program. Almost all of the caregivers who participated reported experiencing benefits as well.

 Another recent study, published on August 25, 2014 in the *American Journal of Alzheimer's Disease and Other Dementias*, provided mindfulness training to patients who were experiencing memory loss - either because of Alzheimer's disease or MCI, or due to strokes or frontotemporal dementia - along with their caregivers. The training consisted of eight sessions that had been designed for the needs of patients with memory loss. Research results showed benefits for both patients and caregivers. By the end of the program, both groups reported lower depression scores, and improved ratings of sleep quality, and increased quality of life.

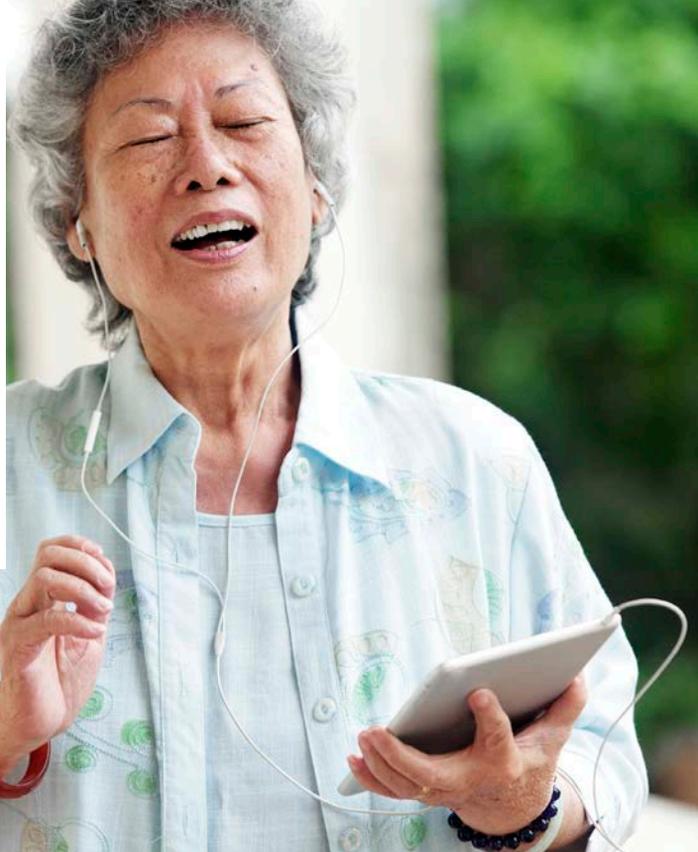
## GIVING MEDITATION A TRY

With the potential for so many brain-boosting benefits, meditation is a great activity to integrate into your day, either as a preventative measure or to combat existing cognitive decline. It doesn't have to take much time, but it's best if you practice a little bit every day rather than for long periods only occasionally.

Meditation training is widely available through in-person classes or through recorded audio programs. You might want to try out a few different styles of meditation to help you discover the one that suits you best. 🌐



# IF MUSIC BE THE FOOD OF LIFE, PLAY ON



The surprising effect  
of music on those  
who need it most



## THE POWER OF MUSIC

**Dr. Michael Gordon,**

Medical Program Director of Palliative Care at Baycrest Health Sciences in Toronto, explains, “The range of potential alternative therapies for coping with dementia is quite wide and different approaches work for different patients, depending on what activities have past positive associations for them. It might be pet therapy or gardening therapy or a therapy using any of the creative arts.”

When used appropriately, music can help boost cognitive function and memory, bolster mood, stimulate positive social interactions, encourage movement, and reduce stress, agitation and aggression. The effects of music therapy sometimes last long after the session has ended. What is especially notable is music’s ability to spark heart-warming outcomes even among patients who are in the very late stages of dementia.

It is thought that **music often gets through to late stage dementia patients, even when often nothing else does,**

because earlier memories remain intact, and music can evoke emotion that helps aid in recalling them. Rhythmic and other well-rehearsed activities like singing are possible in late stage dementia because they do not depend on cognitive functioning for success. This could explain why musical appreciation and aptitude are two of the last abilities to remain in dementia patients as the disease progresses.

## MUSIC THERAPY - HOW IT WORKS

There are a variety of ways that music can be used to help people with dementia, ranging from listening to music, to singing in a choir, to formal music therapy sessions.

### Personalized Music “Recipes”

Formal programs like the one offered by Music & Memory, a non-profit organization which gives iPods to dementia patients in nursing homes, each one programmed with music customized for the recipient, are reaching many patients. The program has been implemented at hundreds of care facilities throughout Canada and the US and its reach continues to expand. Dr. Gor-

don points out that caregivers can provide similar musical stimulation on their own, either in a long-term care facility or in the home. This involves more than turning on the radio. Rather, Dr. Gordon advises caregivers to compile a music “recipe” for the dementia patient; a personalized playlist of music which that person associates with pleasure. If you don’t know the person’s favourite songs or preferred style of music, experiment with different songs and watch for their effect.

Once you’ve finalized the music playlist, put that music on a CD or iPod and ensure it is listened to regularly. “Occasional play is not enough,” Dr. Gordon explains. “You need to do it as a program.” Schedule it into each day at the same time, for an hour if possible. It’s well worth the effort to establish a routine, since the positive effects often last for hours afterward.

Baycrest is currently developing guidelines for caregivers on how to prepare playlists as well as a tip sheet on what to do if there is an unexpected emotional reaction to music shared.

## Singing in a Choir

A more interactive musical experience that works well for dementia patients, particularly in the early to mid stages of the disease, is participating in a singing group. One such group, Buddy's Glee Club, was founded for a three-phase research project at Baycrest. In each phase, patients participated in choral sessions once a week for 16 weeks, led by a music therapist.

The first phase (Glee 1) involved 28 participants from the adult day centre who were cognitively intact and/or diagnosed with mild Alzheimer's disease or other forms of dementia. Glee 2 involved 22 people living in the nursing home, primarily with mild to moderate cognitive impairment including Alzheimer's disease. Glee 3 tested an innovative variation by including caregivers in the choir; 14 nursing home residents with moderate cognitive impairment participated in the choir with a caregiver, the same person each week.

### Dr. Amy Clements-Cortes,



Senior Music Therapist at Baycrest, who led all three phases of the study, explained, that "a variety of test measures were included in each phase of the study, looking at the potential benefits of the experience on the physical, social and emotional dimensions of health."

Overall, the results indicated that singing has benefits for dementia patients, and in the case of Glee 3, for caregivers as well. Participants demonstrated improved mood and happiness, along with reduced pain and increased energy.

The benefits are obvious when observing the choir in action. Dr. Clements-Cortes explains, "It's quite amazing working with people that have dementia. Many of them might sit in a fog or be unconnected to their environment, and as soon as you start singing a song that's in their long-term memory, they can sing along, often with the words intact.



When the level of dementia increases, they are still able to respond rhythmically and even sing the melody with 'la' or a syllable. So we know that it's reaching them. It's a way to stay connected and provides an avenue for communication and expression, whereas other therapies might not do so at that stage."

### Live Music

Yet another way music has been shown to benefit dementia patients is through listening to live music, either one-on-one with a caregiver or as part of a larger audience listening to a performance.

Dr. Clements-Cortes says that many nursing homes bring in musicians to play for residents and there are benefits to that. She also explains that there is a lot of evidence to support caregiver singing. This means that it's a great idea to have nurses and other caregivers use singing as part of their daily caregiving. It helps to bring back memories, minimize agitation and reduce any resistance to necessary tasks such as bathing, eating and taking medication.

### Formal Music Therapy Sessions

Music therapy can be provided both individually or in small groups. Participants work with a professional music therapist and experience a range of interventions such as playing instruments, improvising, moving to music, reminiscing to music, singing and writing songs. A variety of goals can be reached through music therapy such as: reducing pain perception, stimulating cognitive function, decreasing depressive symptoms and enhancing communication.

## MUSIC AS PREVENTION

The benefits of music extend well beyond treatment for dementia. Research is showing that **musical activities are an engaging form of cognitive training that improves brain plasticity in young brains and old.** Investing time in musical pursuits not only provides young brains with a cognitive boost, it has the potential to prevent or delay cognitive decline in later years.

Numerous studies show that participating in **musical training early in life can aid in healthy brain aging years later.** For example, a 2014 study in *Neuropsychology* followed thousands of older adults, some of whom eventually got Alzheimer's and some of whom didn't. The study found that participants who had music lessons in childhood were less likely to experience cognitive decline later in life.

Another example is a study published in the July 2012 issue of *Frontiers in Human Neuroscience*. It also showed that musical instrument training may reduce mental decline associated with aging. The research found that older adults who learned to play an instrument in childhood and continued to play for at least 10 years outperformed their non-musician peers on tests of mental acuity, visual-spatial judgment, verbal memory and recall, and motor dexterity.

Yet another example can be found in a Canadian study led by the Rotman Research Institute (RRI) at Baycrest, which found that musical training in younger years appears to enhance key areas in the brain that are used for speech recognition, and that those enhancements seem to be maintained as you get older. The results, published in *The Journal of Neuroscience* in January 2015, showed that brain response related to speech in older musicians was two to three times better than in non-musician peers.

When an enjoyable pastime like music offers so many potential benefits for the brain, it makes "treatment" a pleasure. 🌍

# REDUCING MEMORY LOSS, NATURALLY

How these alternatives to traditional medication can slow the process of dementia

By: PennyKendall-Reed



Once considered to be a natural part of aging, memory loss now appears to be related more so to lifestyle and environmental factors than time itself. In addition, certain medications used to treat other health conditions have been shown to have a significant impact on memory and brain function.

Understanding that diseases such as Alzheimer's, pre-senile dementia and memory loss can be both primary conditions and a side effect of specific pharmaceutical drugs, makes looking at alternatives to these medications more important than ever. There are no known differences in efficacy of these alternatives when comparing sex or pre and post-menopausal women.

*Note: It is important to discuss any changes to your medication with your physician first. »*

## NON-DROWSY ALTERNATIVES

### 1 USE LACTIUM AS AN ALTERNATIVE TO BENZODIAZEPINES (LIKE VALIUM)

Benzodiazepines are used to treat anxiety, mood disorders, insomnia, and seizures, and block the production of the brain's main anti-inflammatory and antioxidant molecule, melatonin. Melatonin protects neural tissue, as well as inhibiting the binding of chemical messengers to the hippocampus and amygdalae, which are areas in

the brain involved in short term memory, focus and concentration. Lactium is a simple, lactose-free milk peptide that is an effective alternative to Benzodiazepines. It lowers the production of stress hormones that cause anxiety, as well as conditioning the brain's heightened neuro-hormonal response to stress and hyperactivity. In fact, Lactium has been clinically proven to be 10 times more potent than diazepam without the associated drowsiness associated with that class of medication<sup>1</sup>. Reducing the production of stress hormones results in the synthesis of fewer inflammatory mediators that impair memory and allows chemical messengers involved in memory and focus to function maximally. Lower stress hormone levels also allow a healthier, more rejuvenating sleep, improving brain health.



### 2 USE PASSIFLORA, SKULLCAP AND MELATONIN AS AN ALTERNATIVE TO SLEEPING PILLS.

Sedatives and hypnotics have similar effects to benzodiazepines in the brain with a more potent inhibition of melatonin production. There are five stages of sleep. One through four, and REM (Rapid Eye Movement). Stage four sleep is characterized by delta wave brain activity, and only during this phase does the body restore and rejuvenate itself. This can include everything from making a new antibody, to repairing an injured muscle. Melatonin is required to help the brain cycle into stage 4 sleep, and without sufficient melatonin production, the body will skip this stage and return to the less-useful stage one sleep. Melatonin is also the brain's main antioxidant, protecting it from inflammatory damage that contributes to dysfunction and memory loss.

Most sleeping pills inhibit the production of melatonin, and although they will help put you to sleep, they actually prevent



the good healing phase of sleep, leaving you feeling tired, groggy and not fully rejuvenated.

Natural sleep aids such as Passiflora (50 mg), Hops (500 mg) or Skullcap (200 mg) 30 minutes before bed, will bind into the GABA receptor helping to calm the brain and allowing you to fall asleep. Melatonin (3 to 10 mg) 30 to 60 minutes before bed, promotes stage four sleep. These natural alternatives allow a healthy sleep pattern but will not impair memory.

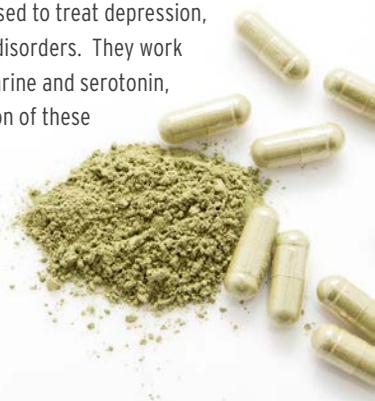
### 3 USE PLANT STEROLS INSTEAD OF CHOLESTEROL-LOWERING STATINS.

Cholesterol is abundant in the brain and is necessary for proper functioning, chemical messenger communication and anti-inflammatory processes. Statin drugs, used to lower cholesterol through the body and prevent arteriosclerosis, also lower neural cholesterol levels and have been shown to impair cognition, memory and focus. Statins also lower the synthesis of CoQ10, necessary for the production of ATP, the body's energy unit, as well as for protecting cellular DNA.

Plant Sterols are naturally occurring compounds in vegetables, legumes, fruits, nuts and seeds that compete with the absorption of dietary cholesterol and inhibit the reabsorption of endogenous cholesterol excreted into the GI tract. Taking 400 to 800 mg of Plant Sterols a day with 50 mg of Pomegranate extract (a powerful antioxidant) helps reduce lipid accumulation and is a safe and effective way of reducing cholesterol levels naturally without impairing memory or cognitive function.<sup>2</sup>

### 4 USE 5-HTP INSTEAD OF TRICYCLIC ANTIDEPRESSANTS.

Tricyclic antidepressant drugs are used to treat depression, chronic pain, hot flashes and mood disorders. They work by inhibiting reuptake of norepinephrine and serotonin, increasing the synaptic concentration of these neurotransmitters. Patients using these medications report significant reduction in mental clarity and memory function. 5-Hydroxytryptophan (5-HTP) is a naturally-



occurring amino acid and chemical precursor as well as a metabolic intermediate in the synthesis of the neurotransmitters serotonin and melatonin. 150 to 600 mg a day is clinically proven as an effective alternative treatment for conditions including depression without the side effects on cognition and memory. Slight stomach upset can occur for the first few days but can be minimized by taking the supplement with a small amount of carbohydrate such as crackers.<sup>3,4</sup>

Unlike other supplements mentioned in this article, 5 HTP should not be combined with antidepressants unless supervised by a medical professional, as it can slightly decrease the efficacy of the pharmaceutical antidepressant. **It is particularly important that individuals taking anti-depressant medication discuss any new supplements or medicines with their physician. They should not discontinue their use without appropriate medical supervision.**

## 5 USE QUERCITIN AS AN ANTIHISTAMINE.

Antihistamine medications are widely used and very effective at alleviating allergy symptoms. They work by blocking histamine receptors, preventing the histamine released during allergic episodes from causing symptoms such as itchy eyes and runny nose. However, they also cross the blood-brain barrier and block the activity of the neurotransmitter acetylcholine. This chemical messenger is crucial for all forms of learning and heightens our responsiveness to stimuli, increasing our focus and attention. Besides causing symptoms such as a dry mouth, antihistamines can also adversely affect brain function.

Quercetin is a bioflavonoid extracted from the whites of citrus fruits and is a potent stabilizer of the mast cells that produce histamine. Taken over a one to two week period, 500 mg of quercetin twice a day desensitizes the mast cell to allergens and teaches the cell to stop producing abnormally high amounts of inflammatory chemicals. Combining quercetin with bromelain, a pineapple extract, increases the absorption and availability of the bioflavonoid. 🍌



**Penny Kendall-Reed** is a Naturopathic Doctor in Toronto. After graduating from McGill University with a B.Sc. in Biology and a minor in Neurobiology, she attended the Canadian College of Naturopathic Medicine. Here she earned her degree in Naturopathic Medicine in 1997 and received the Dr. Allen Tyler Award for Most Outstanding Clinician. Dr. Kendall-Reed incorporates an extensive science and research background into her clinical practice.

\* Dr Kendall-Reed has a commercial relationship with Douglas Labs, the producer of Sereniten Plus

## WHAT STEPS CAN WE TAKE TO PROTECT OUR BRAINS?

Whether or not you are taking medication, there are a few simple measures everyone can take to help protect the brain and prevent the onset of Alzheimer's, dementia and cognitive decline.

**1. REDUCING SUGARS AND WHITE REFINED CARBOHYDRATES IS A CRUCIAL STEP TO INCREASING BRAIN HEALTH.** These foods "caramelize" the coating around the brain, as well as collagen throughout the body. Adding in lean proteins such as fish, egg whites and whey protein powders provides the vital amino acids or building blocks for all brain chemical messengers or neurotransmitters and stabilizes blood sugar levels. It is important to use diet and exercise to maintain a healthy body weight as obesity increases Alzheimer's risk by 60%.

**2. TAKING 2000 TO 4000 MG OF OMEGA-3 FATTY ACIDS WITH EPA AND DHA** not only decreases inflammation in the brain and central nervous system, but ensures adequate fats to form the outer coating of neurons, maintains function of all neural receptors and helps prevent the formation of abnormal plaques that contribute to several neurological conditions that impair memory.

**3. TAKING 3 MG OF MELATONIN BEFORE BED,** regardless of sleep patterns, is the most powerful free radical scavenger and anti-inflammatory for the brain. It is also the most important nutrient in the prevention of dementia and Alzheimer's. One capsule a day of Lactium (Sereniten Plus\*) reduces the excess production of the inflammatory and damaging stress hormones that impair all brain function.

**4. JUST 30 MINUTES OF EXERCISE 5 TIMES A WEEK** is a key lifestyle factor for brain health. It increases blood flow to the brain, reduces cortisol production, helps prevent obesity and stimulates growth hormone for repair. Lack of exercise increases Alzheimer's and dementia risk by 82%.

**5. MEDITATION** which increases delta wave brain activity (the calming and rejuvenating brain wave activity also seen in stage four sleep), inhibits cortisol production and improves blood flow. Just 15 to 30 minutes a day for eight weeks improves hippocampal activity (the key area of the brain that shrinks in dementia), short-term memory, focus, cognitive function, and neural connectivity and transmission.

1. Characterization of  $\alpha$ -caseozepine, a tryptic peptide from bovine  $\alpha$ 1-casein with benzodiazepine-like activity. Laurent Miclo\* Emmanuel Perrin. The FASEB Journal June 2001

2. Kurowska E, Manthey JA. Hypolipidemic effects and absorption of citrus polymethoxylated flavones in hamsters with diet-induced hypercholesterolemia. J Agric Food Chem. 2004. 52:2879-2886. ( Jones RJH, MacDougall DE, Ntanos F, Vanstone CA. Dietary phytosterols as cholesterol-lowering agents in humans. Can J Physiol Pharmacol. 1997. 75:217-227

3. Turner, EH; Loftis, JM; Blackwell, AD (2006). "Serotonin a la carte: supplementation with the serotonin precursor 5-hydroxytryptophan". Pharmacol Ther. 109 (3): 325-38.)

4. Byerley, WF, Judd, LL; Reimherr, FW; Grosser, BI (1987). "5-Hydroxytryptophan: a review of its antidepressant efficiency and adverse effects". J Clin Psychopharmacol 7 (3): 127-37)



# THE EYES (AND NOSE) HAVE IT

## Eyes & Nose Might Be Key to Early Detection



**W**hy does it take so long for most people to get an Alzheimer’s disease diagnosis? One of the reasons is a lack of diagnostic tests that can detect dementia in the early stages, before cognitive decline is evident. Having a way to accurately identify people who are showing early signs of the disease will also allow research into new, more effective treatments, since damage to the brain at that stage may be minimal and perhaps treatable.

Thankfully, research is starting to reveal potential early signs of the disease, an important first step in developing tests for early diagnosis or predicting risk of future dementia. Evidence is showing that some of the earliest signs of Alzheimer’s disease might appear in the eyes and nose, and work is underway examining the potential use of smell and eye assessments as predictors of future cognitive decline.

### ARE YOUR EYES A WINDOW INTO YOUR BRAIN?

One of the distinguishing characteristics of Alzheimer’s disease is the accumulation of beta-amyloid plaques in the brain. Early research suggests these plaques can also build up in the eyes, possibly migrating along the optic nerve from the brain. Several studies have conducted retinal scans using different technologies and all successfully identified which participants had Alzheimer’s disease and ruling out the cognitively healthy participants.

Two examples are:

 A study in Australia with 40 participants correctly identified 100 percent of the Alzheimer’s patients and accurately ruled out 80 percent of those who did not have the disease.

 Another 40 people were participants in a study by Cognoptix, Inc., 20 with probable Alzheimer’s disease and 20 age-matched healthy volunteers. That study accurately identified 85 percent of the Alzheimer’s cases among participants and ruled out 95 percent of the healthy participants.

Retinal scanning shows promise as a tool for both early detection and monitoring of Alzheimer’s disease.

The eyes may hold even more promise as the window into what is going on in the brain. Research in the US and the UK is suggesting yet another way our eyes may provide early clues about future development of dementia.

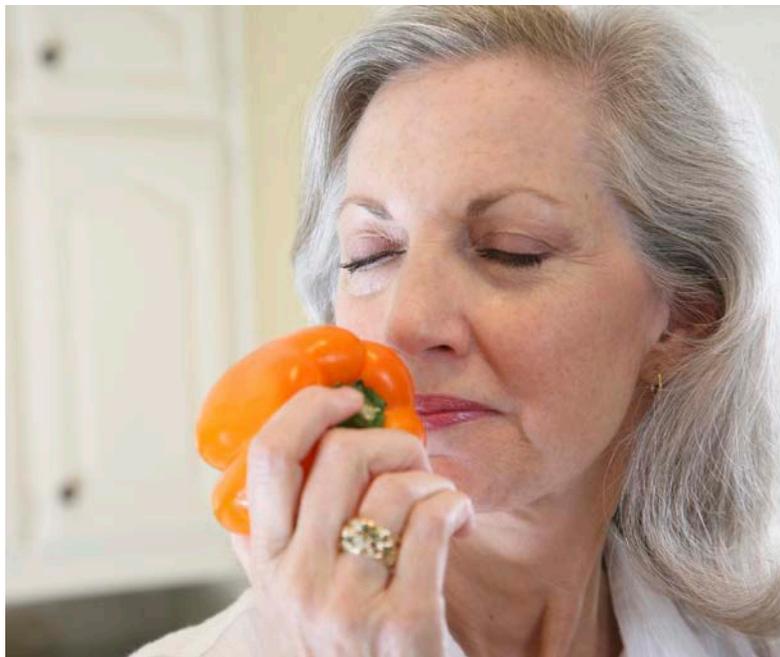
**A SIMPLE, PAINLESS EYE-TRACKING TEST SEEMS TO PROVIDE A WAY TO DIFFERENTIATE BETWEEN PEOPLE WITH EARLY-STAGE MEMORY LOSS AND PEOPLE WITH NORMAL BRAIN FUNCTION.**

Research done in Atlanta had volunteers watch a screen as images

flashed before their eyes. Participants with memory problems showed a slight delay in their response when new images appeared. Researchers concluded that eye tracking tests may make it possible to predict whether a person is on a trajectory to develop Alzheimer's disease or not, about three years before any symptoms appear.

## DOES YOUR NOSE KNOW?

One of the first parts of the brain to be affected in cognitive decline is the area responsible for your sense of smell. So, it's not surprising that losing your sense of smell is considered a potential early sign of dementia.



Many studies have been done to explore the relationship between sense of smell and cognitive decline, trying to determine if smell assessments can be used as predictors of future neurodegenerative diseases.

An Australian study worked with a group of 308 participants, aged 46 to 86, who had no memory problems at the outset. Participants were given a sniff test, which tested their ability to distinguish between different scents.

**THOSE WHO DEMONSTRATED A POOR ABILITY TO DISTINGUISH DIFFERENT SMELLS DURING THE BASELINE TEST WERE MORE LIKELY TO SHOW SIGNS OF MENTAL DECLINE THREE YEARS LATER.**

Another study done in New York City had over 1,000 older adults do a scratch-and-sniff test of 40 common items, asking them to identify each smell from a list of four options. The test was conducted three times between 2004 and 2010. The study revealed that those who scored poorly on the test were more likely to experience cognitive decline over time, but the researchers caution that the results don't prove this approach could be used as a diagnostic tool to determine if someone will definitely decline over time.

In 2011, Dr. Oz, the well-known and popular TV doctor, posted a do-it-yourself "Alzheimer's Smell Test" on his website suggesting

if you can't identify the 12 common items on his list by their smell (when tested by a friend or partner) then you should speak to your doctor. The list included fruits like lemon and cherry, flowers like rose and lilac, along with other distinctive aromas such as smoke and leather.

But in 2012, WebMD responded with an online article, No Proof Alzheimer's Smell Test Works, warning that one must be careful when interpreting the results of DIY smell tests such as the one Dr. Oz suggested. The article indicates that performing poorly on a smell test might not be pointing to an eventual Alzheimer's diagnosis, but might instead confirm that "you are getting older and your sense of

smell is fading." Yes, studies do seem to consistently show that loss of smell and Alzheimer's disease often occur together, but more research is needed to prove whether smell tests can accurately predict future development of cognitive decline.

Newer research on the smell-dementia link, conducted by University of Florida Health researchers in 2013, showed that a smell test using peanut butter and a ruler could be used to confirm a diagnosis of early stage Alzheimer's disease. This study found that early stage Alzheimer's patients experience a dramatic difference between their left and right nostril in detecting the smell of peanut butter; their left nostril was impaired and unable to detect the smell until it was 10cm away, on average. This test requires more study and for now it is considered suitable only for confirming a diagnosis that has already been made using traditional methods; it cannot be considered an accurate method for early detection on its own.

The best way to prevent cognitive decline is to identify those who are at higher risk early. The eyes and nose certainly seem to suggest that they may be effective tools for risk assessment, early detection and monitoring of dementia. With more research, someday anyone worried they are showing early signs of dementia may be able to have their eye doctor look for any signs during a regular exam, or may be able to take a simple smell test. The simplicity and cost effectiveness of those options could dramatically increase the numbers of people getting diagnosed early. 🌐



# RELIEF FOR CAREGIVERS

• • •

People with dementia require extensive support. The burden on caregivers, whether paid staff at a care facility or unpaid family members in the home, is substantial. Advanced dementia patients in particular need help with even the most basic everyday activities such as getting dressed and eating. It can be difficult for caregivers to offer the time and energy to provide stimulating, interactive activities with the patient after all of their basic needs are met. Because of the heavy demand on their time, any help that caregivers can get provides welcome relief from the stresses of trying to care for all of a dementia patient's needs.

One innovative and unexpected solution is being explored in the search for ways to help dementia patients without complete reliance on human caregivers: robots.

## **STUDIES ARE NOW UNDERWAY AROUND THE WORLD TESTING ROBOTS IN MANY FORMS AND FOR A MULTITUDE OF DIFFERENT PURPOSES.**

### **A MAN'S BEST ROBOT**

Researchers from Auckland University in New Zealand are currently testing two robots in a dementia care home for this very purpose. The first robot, called Paro, looks like a pet dog and serves as a companion, aiming to decrease loneliness and depression. The second robot, Guide, looks like a large touch-screen computer and can handle a variety of functions intended to support the health of dementia patients such as: providing reminders to take medication, showing photographs and offering memory games to play. The researchers claim the robots have been "a hit" so far, with patients reacting positively to both Paro and Guide.

### **REDUCED SIGNS OF DEPRESSION**

Japanese inventors have designed a robot baby to see if it helps ease depression among the elderly. Depression and dementia are two conditions that frequently occur together. (The complexity of which is explored in the article "Depression and Dementia: A Complex Relationship" on page 15.) The robot, Babyloid, was created based on the premise that it's helpful for depressed people to have something to do or something to care for in order to feel useful. While the robot does not look like a real human baby, it does sound like one. Babyloid provides feedback by shedding blue LED tears to express sadness, blushing to express happiness and falling asleep when rocked. Early tests conducted in retirement homes found that people played with the robot for an average of seven to eight minutes at a time.

Another project in Japan provides robots that look like baby seals, dinosaurs and cats to people experiencing mid to late-stage dementia. The adorable exteriors mask the hi-tech robots inside which are capable of following voices; responding to changes in pressure,

touch and light; snuggling up to anyone cuddling them; and falling asleep when left alone. The robots are said to look so realistic that many of the study participants were unable to distinguish them from real animals. Results so far have shown that participants experienced significant improvement in emotional response and reduced anxiety levels.

## RECALLING FOND MEMORIES

Academics in Sweden are experimenting with robotic cats to help dementia patients. JustoCat was developed to offer comfort, pleasure and peace of mind. It is the same size and weight as a real cat and it purrs and meows, but it doesn't need to be fed and doesn't make any mess. One of the features that differentiates it from a simple toy is that it's hygienic, with detachable fur that can be cleaned in the washing machine. JustoCat has been used with success by caregivers to help dementia patients relax, become less agitated, increase interaction and improve communication. The robotic cat is thought to be especially effective for former cat owners.

This is because JustoCat allows the patient to recall fond memories associated with cats as a form of reminiscence therapy, where evoking positive memories from the past helps dementia patients feel better. JustoCat is available in Europe and the inventors report that feedback so far has been positive from both dementia patients and their caregivers.



## LESS MAINTENANCE THAN PETS

Part of the appeal of robotic substitutes for animals is the lack of care required when compared to a real animal. Some nursing homes do keep live animals, but staff must be careful that the animals do not become overstimulated or overfed by enthusiastic residents. The same is true for pets who live in homes with dementia sufferers. Yet, if it is possible to provide dementia patients with access to real animals, there are many benefits of doing so, as the examples below demonstrate:

One study looked at women with dementia living in a nursing home. It discovered that the **women who spent 10 minutes with two cats experienced an increase in meaningful communication**. The effects were evident both during the interaction with the cats and immediately afterward.

The Dementia Dog Project in Scotland ([www.dementiadog.org](http://www.dementiadog.org)) provides services that connect dementia patients with dogs. Their

work to date includes a pilot study that is looking at the impact of service dogs trained specifically to work with dementia patients in their home on a permanent basis. Results to date have been very positive, with caregivers noticing immediate improvements in the dementia patients' conversation skills, medication compliance and agitation levels.

## IT LOOKS LIKE EXPOSURE TO ANIMALS THAT YOU CAN'T EVEN TOUCH OR DIRECTLY INTERACT WITH HAS BENEFITS TOO.

Researchers at Purdue University studied the effects of spending time near tanks filled with colourful fish on Alzheimer's patients in three nursing homes. Residents who spent time near the tanks were found to be more relaxed and alert. They also showed a decrease in the number of instances and duration of challenging behaviors such as yelling, wandering off, pacing or physical aggression.

An Ohio State University study points to the power of yet another type of animal, horses, to improve the behavior of people with Alzheimer's disease. When Alzheimer's patients visited a farm and interacted, under supervision, with horses, their attitudes and behavior improved for the duration of the day. Time spent on the farm walking, grooming, bathing and feeding the horses triggered fond childhood memories for 80 percent of the participants, leading to feelings of happiness and relaxation.

There are risks to consider when giving dementia patients access to real animals, both for the dementia patient and the animal. That is why it's important to carefully consider someone's temperament and past experiences with animals (i.e., whether they have positive or negative associations with the type of animal being considered) prior to introduction. It is equally important to find animals that are known to be suitable for dementia therapy work, ideally having been screened by a professional. There are many not-for-profit organizations that screen and train volunteers and their pets to participate in therapy dog programs.

Family caregivers of people with dementia are often referred to as the invisible second patients because of the stresses involved with looking after a loved one who is experiencing cognitive decline. Animal therapy holds promise as a tool to help dementia patients and, of equal importance, to help give the caregivers much needed relief as well. 🐾



# HEY GIRLFRIEND!

Good Friends Bring Good Health



**H**ow do you define a good friend: someone you can lean on, who can make you laugh uncontrollably and support you in life's toughest moments. A landmark study by the University of California, Los Angeles, suggests that female friendships do more for you than just that.

UCLA scientists believe that seeking support from close female friends is one of the ways in which women's bodies cope with stress, and that maintaining these friendships can help improve our overall health. Since the 1930s, males and females were thought to respond to stressful situations through "fight or flight" behaviours; a quickening of the pulse, heightened sensory sensitivity, faster breathing and a feeling of pressure in your chest as your body readies itself to overcome a perceived threat. However, recent findings have revealed that, for women, it may not be that simple.

## SEEKING SUPPORT FROM CLOSE FEMALE FRIENDS IS ONE OF THE WAYS IN WHICH WOMEN'S BODIES COPE WITH STRESS

This ground-breaking research suggests that women have evolved to protect themselves and their offspring not by fighting or fleeing but by "tending" and "befriending," a term for nurturing their children and creating supportive networks with other women. Although

this behaviour may have evolved from the needs of our ancient ancestors, in a modern setting, the mechanisms women have developed for managing stress may explain why they often outlive men.

### IT'S ALL IN THE EVIDENCE

UCLA researchers published their "tend and befriend" findings in 2000 to add another dimension to our understanding of human stress-response behaviour. Throughout her 30-year career, Dr. Shelley Taylor, a psychology professor at UCLA and lead author of the study, felt that the description of "fight or flight" didn't fit with any

of her findings while studying men's and particularly women's reactions to stressful life events. When her colleague, Dr. Laura Cousino Klein indicated that the "fight or flight" theory was based almost exclusively on results from male subjects, they both realized that they had exposed a huge gap in the research.

In the past, women were largely excluded from stress studies because it was assumed that their hormone cycles would produce inconsistent and confusing results. However, a U.S. law passed in 1995, calling for greater gender balance in scientific studies, helping Dr. Taylor and her colleagues gather the evidence they needed to support their theory that women have a larger behavioural repertoire.

## TENDING AND BEFRIENDING

Men and women seem to experience the same initial rush of hormones in stressful situations. However, Dr. Taylor and her colleagues believe that women have evolved to suppress the "fight or flight" response as a result of their traditional role as primary caregivers to children. As both fleeing and fighting could endanger the lives of both mother and infant, they suggest that women instead "tend" to their children by calming and quieting them in order to blend into the environment to evade danger, and "befriend" groups, usually of other women, to form protective social networks.

The "tend and befriend" response builds on what scientists describe as the brain's attachment/caregiving system and is thought to be triggered in part by the hormone oxytocin. While both males and females release oxytocin in response to stress, greater quantities are found in women and its effects appear to be enhanced by estrogen. Men may feel the effects of the "fight or flight" stress response more acutely due to their lower levels of oxytocin and higher levels of testosterone, which is associated with aggression.

For women, when oxytocin is released, it counteracts the processes that prepare the body for action, such as increased heart rate and blood pressure, and inhibits the desire to fight or flee. Instead, it encourages them to nurture infants or gather with other women. As a woman engages in "tending and befriending", more oxytocin is released, which further counters stress and produces a calming effect.

Studies in many different animals and humans show that oxytocin promotes nurturing behaviour and underlies the bond between mothers and their infants. In fact, women tend to be more caring toward their children when they are at their highest level of stress. Animal and human studies have also shown that females are likely to seek out and use social support in stressful situations, and that

oxytocin may again be responsible for this. In a study on female prairie voles, for example, when the subjects were injected with oxytocin, they became more sociable and less aggressive.

Although the "tend and befriend" model emphasizes gender differences, the researchers believe that gender stereotypes are not necessarily written in our genes. This theory is just the beginning of a whole new body of research into stress-related behavioural tendencies.

## WHAT ARE FRIENDS FOR?

Under stress, the desire to seek out social support, or "affiliate," is much stronger in women than in men. It is "one of the most robust differences in adult human behaviour," according to the UCLA researchers. Grouping together allows women to share resources and responsibilities, which is necessary for good health. Social networks are used to provide food and protection against predators and aggressive males, but women still turn to friends for support in the face of life's challenges, such as health concerns, relationship problems and work conflicts.

Friendships not only give us emotional comfort but also benefit our physical health, which could help us understand why women often outlive men. In 2014, the World Health Organization estimated that women live around

six years longer than men in most high-income countries, including in North America. Dr. Taylor and her colleagues suggest one possible explanation is that the calming effect brought on by "tending and befriending" reduces women's vulnerability to stress-related disorders. This makes women less susceptible to episodes of violence, dependence on drugs or alcohol, and even cardiovascular disease.

Researchers are only now starting to recognize the importance of friendship and social networks for our health. **A 2006 study of almost 3,000 nurses with breast cancer revealed that women without close friends were four times as likely to die from the disease as those with ten or more friends.** Another study by the Harvard School of Public Health found that strong social ties helped reduce memory loss and promote brain health in old age. Interestingly, people with friends often have fewer colds, too. Results such as this have led some researchers to conclude that not having friends or confidants is as detrimental to your health as smoking or being overweight.

Our close friends don't only comfort us in times of stress; they also help us to lead happier and healthier lives. So what are friends for? Everything, apparently. 🌍

# TRAUMATIC BRAIN INJURY, COGNITIVE DECLINE & DEMENTIA

By: Dr. Angela Colantonio & Dr. David Stock



**SIGNS & SYMPTOMS** Signs & symptoms of a concussion include a new onset of one or more of the following symptoms, but are not limited to:

loss of consciousness

headache (or a sensation of pressure in your head)

nausea or vomiting

dizziness

seeing stars or lights

blurred or double vision

slurred speech

balance problems

sensitivity to light and/or noise

difficulty concentrating

difficulty remembering

confusion, drowsiness, & an incoherent thought process.

Some symptoms may not be present immediately after the injury, but may emerge in the subsequent hours or days. It is therefore important to monitor for symptoms several days following a head injury.



Each week we hear of athletes who suffer concussions or more severe forms of brain injury. Perhaps more troubling are the stories of former athletes with repeated concussions who years later suffer from early onset dementias. Historically, due to the higher numbers of males participating in contact sports, military combat or other higher risk activities, men have been up to three times more likely to experience brain injury.

As a result, the vast majority of research on this topic has been male-focused, leading to potential-

ly important gaps in our understanding of the risk factors and both short and long term outcomes of Traumatic Brain Injury (TBI). For instance, TBI in the context of intimate partner violence, where up to 92% of hits are to the head, has received relatively little attention.

## WHAT IS TBI?

TBI has been defined as an alteration in brain function, or other evidence of brain pathology caused by an external force. It is caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head

and brain to move back and forth rapidly. The severity can range from critical leading to death to mild TBI commonly called concussion.

A concussion, which is the most common form of TBI, may or may not involve a loss of consciousness. You do not have to black out, or be knocked out, to experience a concussion. Concussion may result in an altered mental status that affects cognitive (e.g. thinking, memory, learning) and physical performance. Symptoms after concussion usually resolve within weeks but can persist.

More serious TBI can result in more persistent and serious problems with thinking ability, language/communication, sensation (problems with vision, smell etc). Motor problems can occur which may include muscle weakness and coordination. Also emotional problems are common which can involve problems with mood, impulse control and personality changes. TBI has a very large human and economic impact on society.

### WHAT DO WE KNOW OF THE KEY DIFFERENCES IN TBI FOR MEN AND WOMEN?

Researchers have observed female rats to be more likely to survive acute head injury and have better immediate outcomes than males. Higher levels of reproductive hormones such as estrogens and progestogens have been implicated in improved outcomes for females (Herson, Koerner et al. 2009). It is surprising, however, that most animal studies on TBI have been done exclusively on male rodents. Current policies by funding agencies internationally are trying to address this gap in both animal and clinical studies.

Differences found in animal studies, however, have not shown consistent results in human studies. The first reviews of clinical studies showed that overall, outcomes were worse for women after TBI (Farace and Alves 2000). However, important factors

such as the average age of injury being higher in women, were not taken into account, potentially at least partially explaining this finding.

Women who have sustained a TBI have reported more headaches and dizziness long term than men. A U.S. study from 2007 reported that female high school and college-level athletes are more likely to be concussed (i.e., have a mild TBI) than males, despite being less likely to participate in the highest risk sports such as football (Gessel, Fields et al. 2007).

Some of this might be a result of girls being more inclined to report injury, but differences in musculature may also mean that, on average, girls are less resilient to these injuries when playing high intensity sports.

## PROTECTING YOUR BRAIN FROM A TRAUMATIC BRAIN INJURY MAY VERY WELL BE ONE WAY TO DECREASE YOUR RISK FOR DEMENTIA.

There is mixed evidence in terms of exactly how and why experiences may differ following a TBI among men and women. Physiological factors, such as differences in reproductive hormone or societal influences may affect injury severity and recovery.

The Canadian Institutes for Health Research's Institute of Gender and Health funded the first comprehensive study on longer-term reproductive outcomes specifically among women with moderate to severe TBI (Colantonio, Mar et al. 2010). Menstrual cycle disruption was reported to occur in the majority of women following TBI and another study reported women to be more likely to suffer more painful periods post injury. Though the effect on conception appears to be minimal, there is indication that women living with the effects of TBI have fewer live births. The long-term impact of reproductive health in

women aging with TBI is still not known.

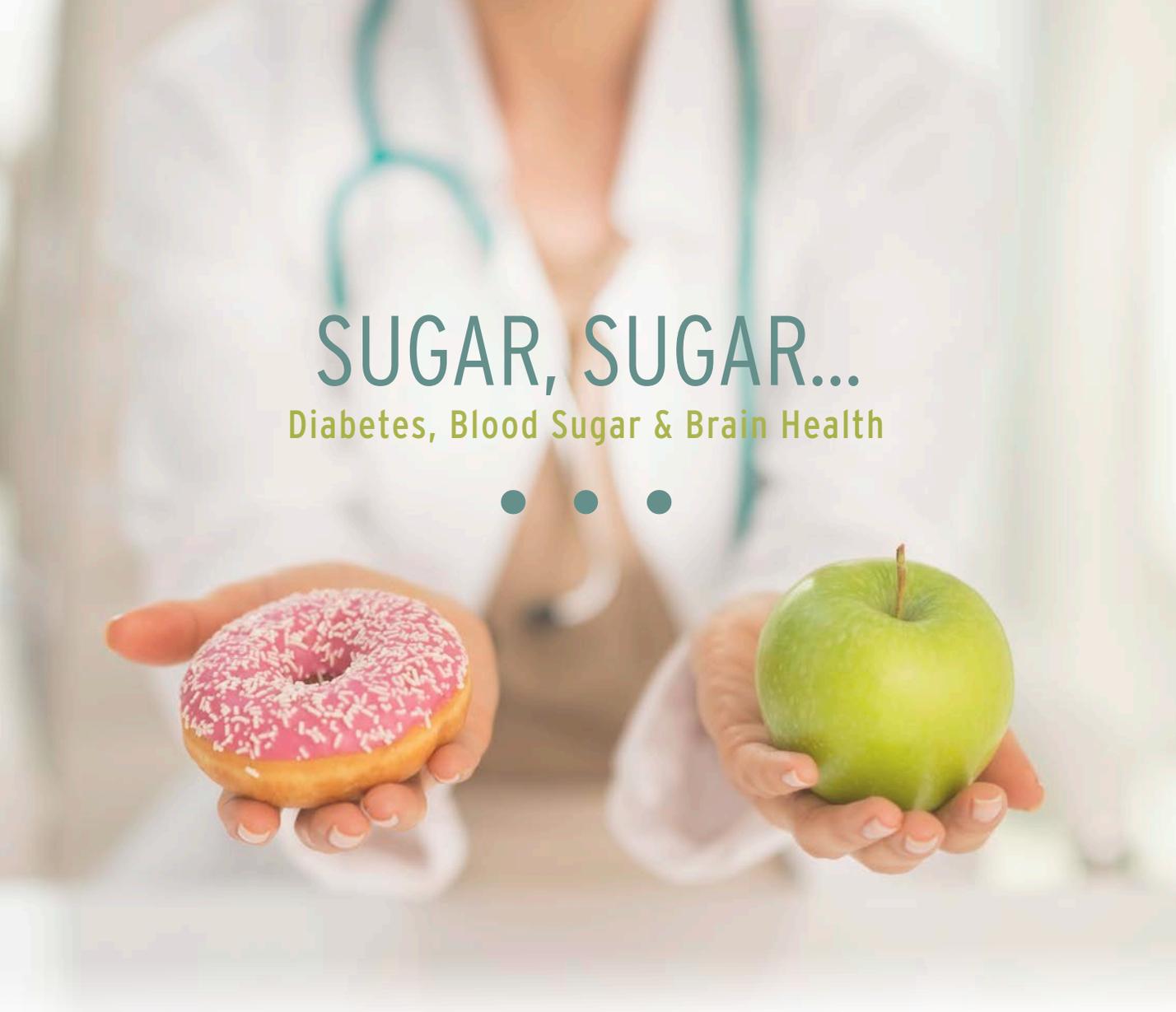
A large clinical study published last December in the *New England Journal of Medicine* evaluated whether progesterone treatment immediately following TBI was beneficial (Wright, Yeats et al.). Researchers did not find that treatment with progesterone improved outcomes, but surprisingly, they discovered that women responded significantly worse to the hormone. Further study into why such sex differences exist is vital to a better understanding of how to avoid negative outcomes after TBI, including future risk of cognitive decline and dementia.

The growing evidence indicating that TBI is indeed a risk factor for dementia suggests that at least as much attention should be paid to prevention. The importance of prevention of brain injury cannot be emphasized enough. The main causes of injury are falls, motor vehicle collisions and being struck by an object or person. Further, after a concussion, it is important to rest immediately after the injury and not return to sport

or other activity too early to avoid risk of re-injury. For older adults who fall, it is important to rule out brain injury. Cognitive signs from a brain injury could be interpreted as dementia. Protecting your brain from a traumatic brain injury may very well be one way to decrease your risk for dementia. 🧠

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# SUGAR, SUGAR...

## Diabetes, Blood Sugar & Brain Health



An estimated 387 million people worldwide had diabetes in 2014, and the incidence rate is expected to continue its rapid climb in the future, reaching 592 million by 2035. People with diabetes face numerous potential health complications including stroke, nerve damage, kidney disease and blindness. New research has added yet another potential complication to that list, dementia. Studies found that people with diabetes, particularly type 2 diabetes, have a higher risk of developing Alzheimer's disease or other types of dementias.

The bottom line is that blood sugar and the brain are connected. Diabetes occurs when the body does not make enough insulin or does not effectively use the insulin it makes. Insulin is a hormone that controls glucose levels, or the amount of sugar, in the blood. Glucose is a main source of fuel for all cells in the body, including the brain.

Type 1 diabetes, which accounts for about ten percent of all cases, occurs when the pancreas does not produce adequate levels of insulin. This is the type usually diagnosed in children and adolescents, and is treated with insulin medication. With type 2 diabetes, the far more common form of the disease, the body's cells stop taking

in glucose from the bloodstream. It is either because the pancreas is not creating enough insulin, or the body has become insulin-resistant and cells are ignoring the insulin's repeated requests to pick up glucose.

**PEOPLE WITH DIABETES,  
PARTICULARLY TYPE 2 DIABETES,  
HAVE A HIGHER RISK OF DEVELOPING  
ALZHEIMER'S DISEASE OR OTHER  
TYPES OF DEMENTIAS**

In cases of insulin resistance, the pancreas actually increases the production of insulin in an attempt to get cells to take up glucose. But the insulin-resistant cells don't take in the necessary glucose for energy production and it accumulates in high levels in the blood; these high blood sugar levels go on to damage nerves and blood

vessels. Also, when cells are insulin-resistant, they are starved of the glucose they need to function. Though glucose is there in ample supply in the blood, the cells just aren't picking it up. This is how it works in the whole body, including the brain. Damaged blood vessels in the brain do not nourish brain cells effectively and so, cells die off and symptoms of dementia develop.

Blood sugar is not the only way diabetes impacts cognitive function. Diabetes is also known to be linked to strokes; one study found that midlife diabetes is associated with an 85 percent higher risk of micro-strokes in the brain. Other studies have shown that micro-strokes are linked to cognitive impairment. Yet another possible impact of diabetes on dementia was found in a study that discov-

## DIABETES IS ASSOCIATED WITH AN 85 PERCENT HIGHER RISK OF MICRO-STROKES IN THE BRAIN

ered that a lack of insulin in the brain may be linked to the formation of protein-plaque that is associated with Alzheimer's.

### HIGHLIGHTS FROM RESEARCH LINKING DIABETES & COGNITIVE DECLINE

Other research looked at diabetes' effects on less severe forms of brain dysfunction such as memory loss or mild cognitive impairment (MCI), a condition in which people experience a slight but noticeable and measurable decline in memory or other thinking skills. Not surprisingly, it turns out that diabetes, or blood sugar irregularities in non-diabetics, appear to be linked to these milder forms of brain dysfunction.

#### Diabetes can accelerate aging of the brain.

After analyzing decades of health data from almost 16,000 people in the United States, researchers from Johns Hopkins Bloomberg School of Public Health found direct links between diabetes and cognitive decline. The data showed that having diabetes in middle age can "age" your brain approximately five years faster than normal, e.g., on average, a 60-year-old who has diabetes experiences cognitive decline on par with a 65-year-old who is aging normally.

#### Lower blood sugar may be good for your brain.

Even for people who don't have diabetes or high blood sugar, those with higher blood sugar levels are more likely to have memory problems, according to a study published in October 2013 in the online issue of *Neurology*. Participants' blood glucose levels and memory skills were tested; recalling fewer words on the memory >>

### HIGHLIGHTS FROM RESEARCH LINKING DIABETES AND DEMENTIA

Having diabetes increases the risk of getting dementia. The widely referenced Rotterdam Study published in 1999, reported that having diabetes almost doubled the risk of dementia. Subsequent studies have backed up that finding.

#### Diabetes and dementia may have a cyclical link.

The brains of people with diabetes often show changes that are consistent with what is seen in dementia patients' brains. Some researchers think that diabetes fuels the damage caused by dementia, and vice versa.

#### Duration of diabetes may be important and it may shrink the brain.

One study reported a strong and consistent association between diabetes in late life and subsequent onset of dementia, and an equivalent or even greater impact on dementia if diabetes is diagnosed earlier, in mid life. The researchers suggest that the duration of diabetes, i.e., how long someone has the condition, is an important risk determinant. Another study backs this up; they found that brain scans showed cognitive impairment happens over a long period of time, and the earlier someone develops type 2 diabetes, the more likely they are to have damage. In particular, diabetes appears to shrink the brain over time, reducing the size of important areas like the hippocampus, which plays an important role in memory. The brains of people who had developed diabetes in middle age were found to be, on average, 2.9 percent smaller than the brains of people without diabetes. Their hippocampi were affected even more dramatically, averaging four percent smaller in volume than non-diabetics.

#### Alzheimer's disease may be "type 3" diabetes.

In many ways, Alzheimer's disease is like a brain form of diabetes in that the brain experiences an impaired ability to take in glucose from the blood. It's like the brain is in a diabetic state, perhaps due to decreased insulin levels or to insulin-insensitivity. This has led some researchers to refer to Alzheimer's disease as "type 3 diabetes," although at least one researcher is not completely behind using that term; the concern is that calling it "type 3 diabetes" may place too much of a focus on diabetes and neglect exploration of other important risk and protective factors.

test was associated with higher blood sugar levels. The same study measured the volume of each participant's hippocampus and found that people with higher blood sugar levels also had smaller volumes in the hippocampus.

### Women-specific research confirms link between diabetes and cognitive decline.

A study of 9,704 older women (average age, 72 years at baseline) published in the February 2007 edition of the *Journal of the American Geriatrics Society* examined participants' cognitive function over a 15-year period. The strongest factor found to be associated with maintaining good cognitive function over time was lack of diabetes. Women who did not have diabetes were almost twice as likely to maintain strong cognitive function than women who did have diabetes.

### PREVENTING DIABETES & COGNITIVE DECLINE

Alzheimer's Disease International says, "The high prevalence of diabetes makes it potentially one of the most important modifiable risk factors for dementia." It is so important because, as they pointed out, it is a modifiable risk factor. This means there are steps individuals, health professionals and governments can take to help lower incidence rates and prevent negative side effects.

An important first step is finding out if you have diabetes. The International Diabetes Federation estimates that 179 million people with diabetes are undiagnosed. The Canadian Diabetes Association website ([www.diabetes.ca](http://www.diabetes.ca)) shares a wealth of information about diabetes including a list of signs and symptoms to watch for and a description of the process for getting tested. There is much you can do to significantly reduce diabetes-related complications and mortality, but you can't be proactive if you go undiagnosed.

If you don't have diabetes, there are many things you can do to prevent it. It is estimated that over 50 percent of type 2 diabetes could be prevented or delayed through healthy lifestyle choices.

Whether you've been diagnosed with diabetes or not, the emerging link between diabetes and dementia provides a compelling reason to take steps to control your blood sugar. Everyone can benefit from the risk-reducing effects of a healthy diet and exercise, and those with diabetes may need to also use oral hypoglycaemic drugs or insulin.

The link between diabetes and dementia helps dispel the myth that dementia is a disease that one gets completely by chance. Adopting a healthy lifestyle that controls your blood sugar levels can go a long way toward improving your odds of avoiding diabetes in all its forms, along with its complications, including cognitive decline and dementia. 🌱



### RISK SCORE PREDICTS DANGER OF DEMENTIA FOR TYPE 2 DIABETICS

Although having diabetes almost doubles the risk of dementia, not all diabetics will develop dementia. Researchers at Kaiser Permanente and University Medical Centre Utrecht in the Netherlands created a tool to help predict which type 2 diabetics have the highest future risk of developing dementia. They examined data over a 10-year period from nearly 30,000 older patients with type 2 diabetes, looking for factors that were most predictive of dementia. They used the eight factors they discovered to create the Diabetes-Specific Dementia Risk Score, a measure utilizing a 20-point scale to represent the risk of developing dementia over the next decade. Individuals who fall into the lowest category of risk score were found to have a 5.3 percent chance of developing dementia in the next 10 years, while people in the highest risk score category were found to have a 73 percent chance. Since all of the factors can be assessed easily, primarily based on medical history, the risk score can be calculated for an individual patient during a routine medical visit.

# MIND DIET

Newest food plan criteria for Reducing Your Alzheimer's Risk



Poultry  
**2x**  
a week

## THE MIND DIET CONSISTS OF:

Three servings of whole grain per day

A salad and one other vegetable each day

Berries at least twice a week (Berries are the only fruit specifically prescribed)

A one-ounce serving of nuts each day

Poultry two times a week

Beans or legumes every other day

Fish at least once a week

A five-ounce glass of red wine each day. If you don't consume alcohol, purple grape juice provides many of the same benefits

No more than one tablespoon per day of butter

Cheese, fried food and fast food no more than once per week

Recently, doctors have developed a “brain-healthy” diet that appears to reduce the risk of developing Alzheimer’s disease by as much as 53 per cent. There is even a bonus; you can follow the diet in moderation and still benefit from its effects.

This new eating plan is called the MIND Diet (Mediterranean-DASH Intervention for Neurodegenerative Delay) and it borrows elements from the heart-healthy Mediterranean Diet and the blood pressure-lowering DASH Diet (which stands for Dietary Approaches to Stop Hypertension). All three diets are essentially plant-based and low in high-fat foods. But the MIND Diet places a specific focus on foods and nutrients linked to optimal brain health, including berries and green leafy vegetables. >>

The study, developed by researchers at Chicago's Rush University Medical Center, aimed to better understand how nutrition could improve brain health and lessen the cognitive decline and memory deterioration that comes with Alzheimer's disease and other forms of dementia. "Past studies have yielded evidence that suggests that what we eat may play a significant role in determining who gets Alzheimer's disease and who doesn't," says Rush Nutritional Epidemiologist Martha Clare Morris.

According to the study, published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, researchers collected data on the food intake of 923 Chicago-residents between the ages of 58 and 98. The participants' eating habits were tracked on how closely they followed one of three diet plans: the MIND Diet, the Mediterranean Diet, or the DASH Diet.

The results revealed that strict adherence to any of the three diets lessened the chances of getting Alzheimer's. The risk of decline for participants following the MIND Diet was a 53 per cent decrease, while those following the Mediterranean Diet experienced a drop of 54 per cent, and individuals under DASH saw a 39 per cent decline in risk.

"One of the more exciting things about this [study] is that people who adhered even moderately to the MIND Diet had a reduction in their risk of Alzheimer's disease," says Morris. "I think that will motivate people."

The MIND Diet consists of 15 dietary components, including 10 "brain-healthy food groups" and five "unhealthy-brain" food groups. The healthy groups include berries, green leafy vegetables as well as other vegetables, whole grains, nuts, beans, fish, poultry, olive oil and wine. The unhealthy groups are red meats, butter and stick margarine, cheese, pastries and sweets, and fried or fast food.

What's more interesting is that the MIND Diet is easier to follow than the Mediterranean Diet, which calls for daily consumption of fish and three to four servings of both fruits and vegetables, Morris says. And where the Mediterranean and DASH diet plans promote fruit intake in general, berries are the only recommended fruit as part of the

MIND Diet. "Blueberries are one of the more potent foods in terms of protecting the brain," says Morris, and strawberries have also performed well in past studies examining the effects of



**NUTS**  
One-ounce serving  
each day



**1 VEGGIE**  
each day &  
a salad

**FISH**  
at least once  
a week

## PEOPLE WHO ADHERED EVEN MODERATELY TO THE MIND DIET HAD A REDUCTION IN THEIR RISK OF ALZHEIMER'S

food on cognitive function.

These new discoveries also suggest that the protection against Alzheimer's disease is greater for those participants that adhere to the MIND Diet for longer periods of time. As is the case with many health-related

habits, including physical exercise, Morris says, "You'll be healthier if you've been doing the right thing for a long time."

The results of the MIND Diet study indicate strong preliminary evidence that brain-boosting benefits can be found in food intake and diet regimens. More importantly, we now have clear evidence of the fact that the early adoption of new "brain healthy" eating habits, even in moderation, can boost brain and lessen the risks of cognitive decline.

### WHAT IF YOU DID MORE THAN JUST CHANGE YOUR DIET?

While the MIND Diet has unveiled significant results when it comes to an individual's diet, what's stopping us from taking these benefits even further and seeing what would happen when a "brain healthy" diet is enhanced with a series of lifestyle modifications? The FINGER Study (derived from Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability) reveals that beneficial results can be reached when not just one, but multiple factors like diet and exercise, are targeted.

This Swedish study, looked at multiple approaches to improving and

maintaining cognitive functioning through lifestyle interventions based on the objective of lowering the risk of dementia.

Led by Miia Kivipelto, professor of Clinical Geriatric Epidemiology at Karolinska Institute in Stockholm, the FINGER Study followed 1,260 participants who were at a high risk of developing dementia. After being randomly assigned into two groups, the first group, which was also the control group, received the best medical advice available and regular cognitive testing. The second group was subject to an intensive series of lifestyle interventions including diet, exercise, cognitive training and social activity.

### The intervention was delivered in four components:

1. **Diet:** this was administered by nutritionists in individual and group sessions, and included individual tailoring of the participants' diet.
2. **Exercise:** this was administered by physiotherapists following international guidelines and included exercises to build muscle strength and aerobic activities.
3. **Cognitive stimulation:** this was administered by psychologists in group and individual sessions. It included a web-based training program delivered in short sessions, three times per week for two six-month periods, and education on cognitive changes in older people. Frequent discussion meetings encouraged social interaction within the intervention groups.
4. **Metabolic and vascular risk management:** these risk factors were actively managed with frequent meetings and assessments by the study nurse and physician to take blood

pressure and other measurements relevant to vascular health. After each assessment, participants were given advice on lifestyle management and advised to consult their own doctors if necessary, but were not directly prescribed medication.

The results from the study demonstrated significant improvements on a comprehensive cognitive examination. In addition to performing better overall, the intervention group improved on memory tests, executive function (such as planning, judgment, and problem-solving), and speed of cognitive processing.

"This is the first randomized control trial showing that it is possible to prevent cognitive decline using a multi-domain intervention among older at-risk individuals," says Kivipelto. "There are links between cognitive decline in older people and factors such as diet, heart health, and fitness. Our study shows that an intensive program aimed at addressing these risk factors might be able to prevent cognitive decline in elderly people who are at risk of dementia."

## THERE ARE LINKS BETWEEN COGNITIVE DECLINE IN OLDER PEOPLE & FACTORS SUCH AS DIET, HEART HEALTH, AND FITNESS

An extended, seven-year follow up investigation to the FINGER Study is now planned. It will include the measuring of dementia and Alzheimer's incidence, giving further life to the idea that mental deterioration can be significantly reduced by targeting multiple lifestyles factors. 🌱

## DELICIOUS FOODS THAT SUPERCHARGE YOUR BRAIN



### TUNA

is an excellent source of B12, an important vitamin to combat brain shrinkage



### KALE

is full of antioxidants to help reduce brain inflammation & loaded with Omega-3 fatty acids to optimize brain function

Flip over for some brain healthy recipes...

## AHI TUNA CLUB

Makes 4 servings

- 8 oz raw ahi tuna
- 1 Tbsp sesame seeds
- 8 slices crusty bread-1/2 inch/1 cm thick
- 1/3 cup guacamole
- 1 Tbsp reduced-fat mayonnaise
- 1 tsp wasabi
- 2 Tbsp chopped cilantro
- 12 thin slices plum tomato
- 4 pieces prosciutto
- 1/3 cup baby spinach leaves

1 Dip the tuna in sesame seeds, and in a hot skillet sprayed with vegetable oil,

sear the tuna for about 2 minutes per side, depending upon the thickness. The tuna will continue to cook after searing. Remove from the heat, cool, then thinly slice.

2 Toast the bread slices.

3 Combine the guacamole, mayonnaise, wasabi and cilantro. Spread over the bread slices. Place the tomato slices, prosciutto and spinach leaves on 4 slices of the bread. Add the tuna. Place the other bread slices ovetop and serve.

**Preparation time:** 10 minutes

**Cooking time:** 4 minutes

**Nutritional Information per Serving:**

Calories 330

Carbohydrates 39.2 g

Fibre 4.7 g

Protein 24.1 g

Total fat 8 g

Saturated fat 2 g

Cholesterol 37 mg

Sodium 600 mg



## KALE, SPINACH, RASPBERRY & GOAT CHEESE SALAD

Makes 6 servings

- 4 cups baby spinach
- 4 cups baby kale
- 1/2 cup thinly sliced red onion
- 1 cup fresh raspberries
- 1/3 cup chopped almonds
- 1/2 cup crumbled goat cheese

**DRESSING**

- 1 1/2 Tbsp cider vinegar
- 1 Tbsp olive oil
- 1 Tbsp apple or orange juice concentrate
- 1 tsp brown sugar
- 1/2 tsp chopped garlic
- 1/2 tsp Dijon mustard

1 To make the salad: Place the spinach, kale, onions, raspberries and goat cheese in a large serving bowl.

2 To make the dressing: Whisk together the cider vinegar, olive oil, apple juice concentrate, brown sugar, garlic and mustard in a small bowl. Pour the dressing over the salad and toss. Top with the chopped nuts.

**Preparation time:** 15 minutes

**Nutrition information per serving:**

Calories 138

Carbohydrates 14 g

Fibre 3 g

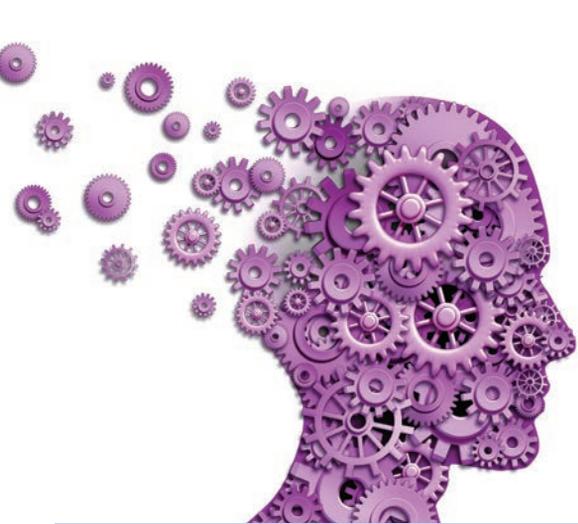
Protein 4.2 g

Total fat 7 g

Saturated fat 1.7 g

Cholesterol 4 mg

Sodium 160 mg



# OUR GREY MATTER MATTERS

JOIN THE FIGHT TO COMBAT WOMEN'S BRAIN AGING DISEASES

**We are truly grateful to all those who generously supported this publication:**

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## DONATE NOW

Women's Brain Health Initiative is a charitable non-profit with a mandate to provide education and fund research to combat brain aging diseases that affect women. We rely on philanthropic gifts to support this endeavour.

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

**70% of Alzheimer's sufferers are women.  
You can't ignore a number this big.**



Women's Brain Health Initiative

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- \$250    \$100   Other \$ \_\_\_\_\_

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

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PROJECT

TO COMBAT WOMEN'S BRAIN AGING DISORDERS

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