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MIND OVER MATTER®

WILL COVID-19 CREATE A MENTAL HEALTH "TSUNAMI"?

EARLY DETECTION OF DEMENTIA

COLOURING GAINS POPULARITY WITH STRESSED-OUT ADULTS

CHEW ON THIS WITH CHEF MARK MCEWAN

TAKING THE CHALLENGE ON WOMEN'S BRAIN HEALTH DAY

HOW SEX & EXERCISE AFFECT YOUR BRAIN HEALTH

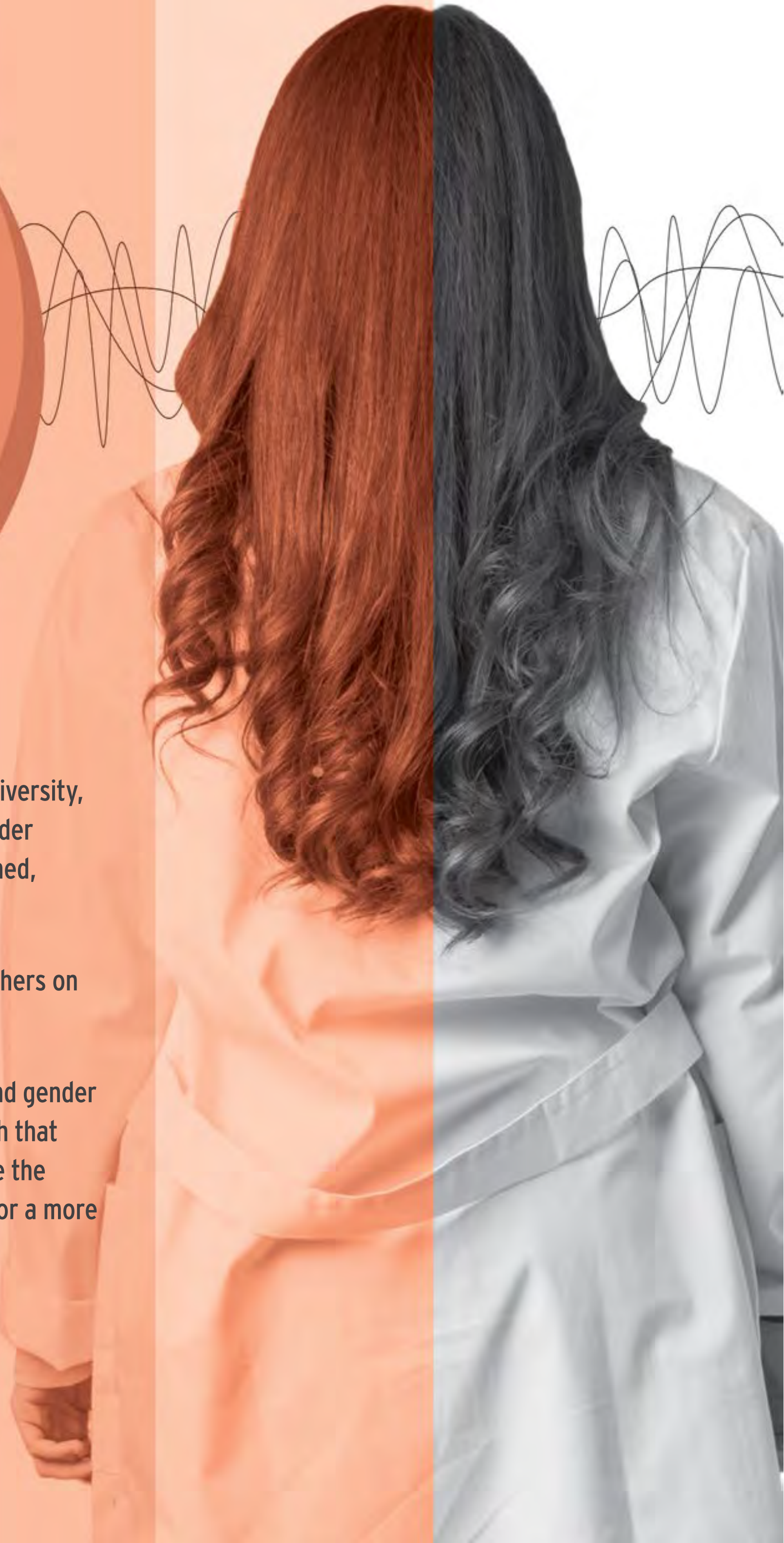
Insight into the latest research findings to combat brain-aging diseases and what you need to stay brain healthy longer.

Women's Brain Health Initiative

WBHI.ORG | VOLUME 12

MAKING AN IMPACT

BRAIN CANADA'S COMMITMENT TO EQUITY, DIVERSITY & INCLUSION



> "The research community has gone through this realization that we need to better design research, we need to be more inclusive, and we need to consider the patients and their perspective."
>
> – Viviane Poupon
> President & CEO
> of Brain Canada

Integrating a sex and gender lens, and an equity, diversity, and inclusion (EDI) lens, in research is critical in order to improve the way health interventions are designed, measured, analyzed, reported, and implemented.

Read more about our Brain Canada funded researchers on pages 15-16 and 29-32.

By funding projects that effectively address sex and gender differences, Brain Canada aims to support research that is applicable to everyone and will ultimately enable the development of new diagnostics or interventions for a more diverse group of people in Canada.

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EDITOR'S LETTER

Welcome to the 12th edition of Mind Over Matter® and the 10th in which we collaborated with our wonderful partners at Brain Canada. Given all that the world has endured over the past year, it may be the most remarkable.

The pandemic has tested all of us in ways both unexpected and unprecedented. I am truly inspired by the resilience, fortitude, and creativity of the many dedicated friends, supporters, and team members of Women's Brain Health Initiative (WBHI).

When the lockdowns were first imposed in March 2020, we quickly altered course from the in-person events that are a signature of ours, hoping that circumstances might improve by autumn. Before long, though, it was clear that large gatherings would be impossible throughout 2020 – a heartbreaking, but necessary, measure.

Fortunately, our team had the ability to work from home and we began exploring alternative means for WBHI to reach more and teach more, which included hosting a series of virtual events. It was a revelation. As you will read in the article about the second annual Women's Brain Health Day, our virtual program on December 2, 2020 reached over 1,500 people across the continent – a larger audience than we have ever hosted in any venue.

Through the use of video-teleconferencing platforms, we have been able to connect with so many more people (even if we do miss the personal contact). We will continue to use these tools in the future to support and supplement our work. While we do not know exactly when we will be able to gather again in person, we hope that we can do so by the end of the year, and (with fingers crossed) we are tentatively planning the third annual Women's Brain Health Day as a hybrid of in-person and virtual activities.

The pandemic's effects are reflected in several of our articles. We report on its unequal effects on women, as well as its impact on mental health – a pervasive challenge that demands immediate attention. There is also a piece on resilience (a quality that we have all needed during these trying times), which contains various tips for taking control of our lives and adapting in the face of adversity.

With the rising number of individuals with dementia across the globe, we hope that loved ones will find our caregiving guide to be helpful. They may also appreciate the powerful story of how a prominent former federal cabinet minister, Lisa Raitt, is coping with her husband's young-onset Alzheimer's. Lisa offers a frank, raw account of her personal challenges and provides valuable advice for others experiencing similar circumstances.

End-of-life issues for individuals with dementia were recently debated in Parliament, with lawmakers grappling with the sensitive and complex matter of medical assistance in dying (MAiD). In this edition, we profile a vibrant retired educator named Ron Posno who has become an important advocate for MAiD, striving to take control of his own end of life after receiving a diagnosis of mild cognitive impairment.

As always, we bring you into the laboratories of some of Canada's most brilliant researchers in brain health, aging, sex, and gender. Building on our growing emphasis on diversity, we are proud to be funding a new project that is studying the long-term cognitive impact of hormone treatments in trans women. You will read about the fascinating story of a young researcher, Reubs Walsh, who is collaborating with Dr. Gillian Einstein on the project.

Dr. Einstein, the holder of the Wilfred and Joyce Posluns Research Chair in Women's Brain Health and Aging at the University of Toronto, continues to push the boundaries of our knowledge. I encourage you to read about the results of a study she recently co-authored with Dr. Nicole Gervais about the effects of hormone therapy on cognition among women who had their ovaries removed to protect themselves against cancer.

One of the things I have learned in meeting researchers across the country is that a significant amount of their time is devoted to seeking funding for projects, a task that bedevils young scientists in the early stages of their careers. It is a classic Catch-22: they need to show research results in order to be eligible for funding, but they cannot develop the data until they receive the funds to complete the work. Brain Canada is stepping in to fill that gap with an innovative program called "Future Leaders," which is geared towards supporting emerging researchers. In this edition, we profile six women from the first group of researchers to receive the grants.


PHOTO: JAYLYN TODD

I am mindful that the pandemic has been a difficult period for many charities. That is why I am especially grateful to you, our readers, and to our many generous donors and partners, and our incredible team, for everything that has been done over the past year to keep pushing forward with the cause of women's brain health. I am both humbled and eternally grateful for the support that allows us to continue to grow.

Thank you and I wish you good health.

Lynn

Lynn Posluns
Founder and President,
Women's Brain Health Initiative

THINK ABOUT IT

HELPFUL THINKING

BETTER THINKING

LOOKING FOR MORE COPIES?

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CONTRIBUTORS

AMY CRYSTAL // CONTRIBUTING EDITOR

Amy is a real estate lawyer at DelZotto, Zorzi LLP, one of Canada's top real estate boutique law firms. "Although many people think of dementia as a disease that affects older adults, the disease begins to impact the brain decades before symptoms are even noticed. WBHI is inspiring a new generation of women to take care of our brain health today, since research now shows that the earlier you protect your brain health, the better the cognitive outcome."

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."

DILIA NARDUZZI // WRITER

Dilia is a writer and editor living in Hamilton, Ontario. She has been interested in the benefits of a healthy lifestyle for over twenty years. She studied gender dynamics while doing graduate work at McMaster University and is truly honoured to be using those skills to write for Mind Over Matter®. "I want the medical profession and all women to know that women's bodies require specialized medical care."

SEAN MALLEN // WRITER

Sean is a Toronto-based communications consultant, media trainer, and writer. Having seen close family members deal with dementia, he is a passionate supporter of WBHI's mission and is inspired by telling the stories of researchers who are expanding our knowledge of women's brain health. Sean's first book, *Falling for London: A Cautionary Tale* from Dundurn Press, is widely available across Canada, the U.S., and the U.K.

SUSANNE GAGE // WRITER

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

VITINA BLUMENTHAL // CREATIVE DIRECTOR

Vitina, co-founder of Align Creative Minds, is creative to her core with a passion for a healthy lifestyle (especially all things yoga), and sharing her love of mindfulness with others. Through WBHI's Young Person's Cabinet, she encourages millennials to start taking care of their brain health and mental health.

GREGORY CIRA // CREATIVE DESIGNER

Gregory is an established design entrepreneur with an acuity for information design and understands the importance of communicating clearly. Having had family members who suffered from dementia, he has been inspired to raise awareness of the importance of brain health and uses his visual communication skills to help bring that awareness to others.

COVER PHOTO: JAYLYN TODD

PATTIE LOVETT-REID & JANE LOVETT //
ON THE COVER

From long, vigorous walks at the cottage to boxing classes, Pattie Lovett-Reid and her daughter Jane Lovett enjoy working up a sweat together, taking care of both body and brain. "My mom and I do so much together. Appearing on the cover of Mind Over Matter® will be another fabulous memory," said Jane. Pattie, the Chief Financial Commentator for CTV News, stepped up for WBHI this past fall, co-hosting the Stand Ahead® fundraising event. "I think we learn from each other. I turn to Jane for advice on many different things, so for her to be on the cover with me is a great honour."

EPHRAM CHAPLICK, SARAH CHAPLICK & AMY CRYSTAL //
ON THE (BACK) COVER

Recognizing that women suffer from dementia twice as much as men, Ephram Chaplick and his wife Linda have always encouraged their daughters, Amy Crystal and Sarah Chaplick, to maintain a healthy lifestyle in order to help protect their cognitive vitality. "I have a remarkable wife and two phenomenal daughters, and we must become aware of what we can do in our daily lives to help prevent this devastating disease," said Ephram. The father-daughter trio was honoured to be featured in Mind Over Matter®, and to remind us to think about the women in our lives and how much we depend upon their insights and memories.

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Brain Canada recognizes Women's Brain Health Initiative for its role in educating the public about the importance of women's brain health and the role of prevention, but neither Brain Canada nor the Minister of Health or the Government of Canada are responsible for the accuracy of the contents of this magazine.

EMOTIONAL RESCUE

THE IMPORTANCE OF LETTING GO

Have you ever considered the ways in which your emotions - and, more specifically, how you express (or do not express) them, and the patterns you have established throughout the years - can impact your health over time? Researchers are now finding links between our emotional coping styles and long-term health conditions, such as heart disease, cancer, and even Alzheimer's disease.

Emotional suppression, defined as a tendency to inhibit the expression of emotion, has long been suspected to influence health. It is a type of coping strategy that involves intentionally avoiding distressing or uncomfortable thoughts by holding feelings in or focusing on other matters. When used from time to time, emotional suppression does not appear to have significant negative consequences. However, repeatedly suppressing your emotions may potentially lead to serious health outcomes in the future.

EMOTIONAL SUPPRESSION

Research published in the *Journal of Psychosomatic Research* in October 2013 found that emotional suppression may increase one's risk of earlier death from any cause, including death from cardiovascular disease and cancer. The researchers examined the results of 729 participants from the General Social Survey (an annual study of opinions and attitudes among the U.S. public out of the University of Chicago), which looked at health changes over a 12-year period with respect to emotions.

The survey used the "Emotion Suppression Scale," which asked respondents to indicate whether they agreed or disagreed (on a scale ranging from "strongly disagree" to "strongly agree") with statements such as "I keep my emotions to myself," "I try to be pleasant so that others won't get upset," and "When I'm anxious I try not to worry anyone else." Remarkably, the researchers found significant associations between mortality and those participants who were more prone to emotional suppression.

The researchers caution that while the association appears to exist, more research needs to be conducted in order to understand why this is the case. For instance, is emotional suppression leading to other unhealthy behaviours, and how is it linked to or different from emotional repression or alexithymia (i.e. the inability to identify and verbalize emotions)? Additionally, what is happening in the body physiologically when someone suppresses emotions, and could the process be leading to disruptions in the endocrine and nervous systems (and beyond)?

Other studies have found similar links between emotional suppression and adverse health outcomes, whether short or long term. Suppressing emotions may lead to higher levels of aggression, for example, as noted by a study published in *Social Psychological and Personality Science* in March 2011. The researchers divided participants into two groups: one that was allowed to react naturally to two emotionally charged films ("The Meaning of Life" and "Trainspotting"), and the other had to suppress their feelings (i.e. show no reaction). Interestingly enough, the latter group was found to be more aggressive after the experience. These findings may suggest that individuals who are habitually aggressive or angry may be suppressing emotions in other areas of their lives.

IT APPEARS THAT ONE'S LONG-TERM BRAIN HEALTH IS ALSO AFFECTED BY EMOTIONAL SUPPRESSION.

More recently, research published in the December 2020 issue of *Alzheimer's and Dementia* (involving a Finnish population-based survey of over 1,000 older adults) found that those who "fully agreed" with the statement "I suppressed my emotions from others" had nearly five times higher risk of developing Alzheimer's disease or other types of dementia, as compared to those who "fully disagreed" on suppressing their emotions.

While more research is required, it is becoming clearer that emotions play a role in long-term health outcomes. "If you look at human evolution, why do we have emotions? We have them because they're good for us," noted Dr. Wolfgang Linden, Professor Emeritus in the Department of Psychology at the University of British Columbia. Anxiety or fear alerts us to danger, and anger can be an indicator that we feel something is unjust or that our boundaries have been crossed.

"These emotions become problematic only when they become repetitive," said Dr. Linden. "For instance, when you lose contact with real life, as in the case of depression, or when anger leads to violence and abuse." A brief bout of anger or sadness is not going to affect your long-term health and, in fact, is quite normal depending on what is happening in your life.

WORKING WITH YOUR EMOTIONS

What happens, then, if you have fallen into a pattern of suppressing emotions for a long period of time? How do you begin to make a change? You can start by learning to work with your emotions differently. If it is an emotion such as fear, Dr. Linden suggests that one way to interact with it (instead of constantly worrying or ruminating) would be to work within a practice called "acceptance and commitment therapy." Here, rather than suppress or try to deny your emotions, "you accept that sometimes in life you will be anxious, and you may have a depressive phase. That's okay. This is human life," explained Dr. Linden.

By accepting the emotion, you stop fearing the fear itself, and act more mindfully during a difficult life situation. The commitment part of the therapy involves facing the fearful matter head on and making a plan to do so. You may want to try working with a therapist, or talking about your feelings with a family member or friend. You can also try writing about your fear or going for a long walk. ⟶

There are many tools that you can use as coping mechanisms, and with some mindfulness, "you can cut out all this anticipating that this terrible thing is going to happen, because it probably will, and you probably will be okay."

EMOTIONAL REGULATION

Another way to engage your emotions more productively is to embrace a practice commonly referred to as "emotional regulation" – a term that is generally used to describe a person's ability to effectively manage and respond to an emotional experience. While it may feel like emotions such as anger, sadness, and happiness come and go on their own, we do have more control over them than we may realize, noted one of the leading experts on emotional regulation, Dr. James J. Gross, Professor of Psychology at Stanford University and Director of the Stanford Psychophysiology Laboratory. It is that starting point that leads to thinking about the various ways in which we interact with our emotions as they arise.

Dr. Gross has identified five emotion regulatory processes, a few of which focus on the specific situations that people find themselves in. For example, if you are at a family or work event with someone who frustrates you, are you able to avoid the situation altogether, or, if that is not possible, could you sit on the opposite end of the room away from that person? One of the most powerful of the five processes is referred to as "cognitive change," which involves altering the way you think about a particular interaction or a situation that you have been in, said Dr. Gross. If you find out that someone who is making you angry has suffered a recent loss, for example, your emotional output may change from anger to sadness or empathy.

ON THE BRIGHT SIDE

Enjoying the "good" or "positive" emotions (e.g. joy, contentment, and curiosity) can have beneficial outcomes for our physical and mental health. Over the years, researchers have found that laughter, for example, activates multiple regions of the brain (the motor cortex, the frontal lobe, and the limbic system) and is good for both short- and long-term health. One study found that the effects of stressful life experiences and the associated symptoms of stress were moderated by the frequency of laughter experienced at the time of the stressful event. Another study published in Health Psychology examined the medical data of over 1,000 patients and found that those who experienced the positive emotion of hope had a decreased likelihood of having or developing a disease, and the positive emotion of curiosity was connected to a decreased likelihood of hypertension and diabetes.

In some circumstances, it is inappropriate for emotions to be regulated. If you are angry at your child for experimenting with drugs, for example, it may be important for there to be some strong emotions behind your words when expressing your disapproval, noted Dr. Gross. Other times, suppression (at least in the immediate moment) is fitting, notwithstanding that it may cause health issues in the future. If you are angry with your boss, it may be best to avoid expressing your anger in the moment, and instead share your feelings with a friend or a therapist. It is important to remember that there are several options for emotional exploration beyond merely "shutting it down or expressing it fully," observed Dr. Gross.

Some of us were taught that expressing or working with our emotions is unseemly or problematic. It is time, however, to start challenging that misconception. Dr. Linden reminds us that the first step is to "accept the fact that emotions are a part of human life." Even the so-called "negative" emotions are with us for a reason. We do not want to dwell within the negative for longer than we have to, of course, but we can find ways (with support if needed) to acknowledge, express, and/or regulate our emotions. "Overall, those with the most versatile coping toolbox wins," said Dr. Linden.

ANIMAL ATTRACTION

PETS CAN BE THERAPEUTIC FOR THE BODY & SOUL

Those of us who are animal lovers know instinctively the benefits we experience when spending time with them, whether the animal is a dog, cat, bird, lizard, or pot-bellied pig. Depending on the type of animal, there may be cuddles that warm your heart and calm your nerves, walks that get you out exercising and socializing with your neighbours, and a feeling that you are deeply and unconditionally loved.

IMPORTANTLY, THE THERAPEUTIC VALUE OF OUR RELATIONSHIP WITH OUR PETS IS INCREASINGLY BEING RECOGNIZED BY RESEARCHERS.→

In a 2019 survey of 2,036 people living in the United States (including 1,469 who were pet owners) conducted by the Human Animal Bond Research Institute (HABRI) in partnership with Mars Petcare, 85% of respondents indicated that they believe interaction with companion animals can help reduce loneliness, while 76% of respondents said they agree that human-animal interactions can help address social isolation.

Further, the researchers found that pet owners with the closest bond to their pet experienced the highest positive impact on their feelings of loneliness and social isolation. These are especially important findings because social isolation and loneliness are becoming more and more common, particularly during the COVID-19 pandemic, and they have a sizeable negative impact on health.

ANIMAL INTERACTION & MENTAL HEALTH

Research conducted by Dr. Julianne Holt-Lunstad and colleagues has revealed that social connection is linked with mortality risk. Dr. Holt-Lunstad reported in a 2017 *Testimony Before the U.S. Senate Aging Committee* that lack of social connection carries a risk that is comparable to (and, in many cases, exceeds that of) other well-accepted risk factors, including smoking up to 15 cigarettes a day, obesity, physical inactivity, and air pollution.

There is widespread agreement among both pet owners and non-owners that companion animals can play a role in addressing the societal challenge of loneliness and social isolation.

In a study published in 2014 in *Western Journal of Nursing Research*, Dr. Nancy Edwards and colleagues examined the influence of an aquarium on the behaviour of 71 residents, and on the satisfaction of 71 staff, in dementia units in three U.S. long-term care facilities. Resident behaviour was assessed using an adapted version of the "Nursing Home Disruptive Behavior Scale," while staff satisfaction was measured using an adaptation of the "Assessment of Work Environment Schedule."

HOW ARE SOCIAL ISOLATION & LONELINESS DIFFERENT?

Social isolation and loneliness are conceptualized and measured differently by researchers. **Social isolation** is represented by the size of a person's social network and the frequency of contact between those people, whereas **loneliness** is a subjective experience and reflects a person's feelings about her or his social network (i.e. there is a discrepancy between one's desired and actual level of connection).

After baseline measurements were taken, an aquarium was introduced in the room where residents ate their meals. The aquarium was designed specifically for use in long-term care, with a large viewing area, back lighting, and eight to ten colourful fish to promote good visibility. After ten weeks, follow-up measurements were collected and showed that overall residents' behaviour score had significantly improved, as did the staff's satisfaction score. Dr. Edwards, an Associate Professor of Nursing at Purdue University College of Veterinary Medicine, noted that

> “
> **AQUARIUMS ARE AN INNOVATIVE AND EFFECTIVE FORM OF ANIMAL-ASSISTED THERAPY THAT SUITS A DEMENTIA CARE SETTING.**

She also added that behavioural and psychological symptoms of dementia are "among the most difficult for staff to handle, so it's not surprising that by helping improve those types of challenging behaviours in those with dementia, staff satisfaction also improved. This type of intervention is especially exciting because it is non-pharmaceutical, low-cost, and does not require much additional work by the staff."

More recently, researchers from the University of York and the University of Lincoln in the U.K. found that sharing a home with a pet appeared to act as a buffer against psychological stress during the pandemic lockdown. The study – published in the September 2020 issue of *PLoS One* – sought to investigate the links between mental health and loneliness, companion animal ownership, and human-animal interactions. The study also set out to explore pet owners' perceptions of the role of their animals during the lockdown.

> **THE RESEARCHERS FOUND THAT HAVING A PET WAS ASSOCIATED WITH MAINTAINING BETTER MENTAL HEALTH AND REDUCING LONELINESS.**

More than 90% of the nearly 6,000 participants living in the U.K. indicated that they believed that their pet helped them cope emotionally with the lockdown and 96% said that their pet helped keep them fit and active. Interestingly, the strength of the human-animal bond did not differ significantly between species, with the most common pets being cats and dogs followed by small mammals and fish. However, the majority of the pet owners (67.6%) reported having been worried about their animal(s) because of the pandemic, most frequently due to restricted access to veterinary care.

It is important to note, though, that the generalisability of these findings is limited by several factors. For instance, the study population was a convenience sample that was not representative of the U.K. general population, as it consisted largely of female companion animal owners. Additionally, the majority of the participants who did not own a pet reported that they would like to or were planning to have one. The researchers therefore noted that this survey was evidently a "survey of animal lovers."

The study nevertheless highlighted the role of companion animals as potential social buffers for psychological distress and loneliness. The researchers observed that further targeted investigations relating to these important areas of human health are required.

ANIMAL INTERACTION & PHYSICAL HEALTH

Interestingly, the presence of aquariums in long-term care facilities has also been associated with *physical* health benefits. Another study by Dr. Nancy Edwards and a colleague assessed the influence of aquariums on the weight of individuals with dementia living in three care facilities. That study involved 70 residents in dementia units where aquariums were introduced into each common dining area.

Food intake was measured for all three meals at various points throughout the study, while body weight was measured at baseline and again after ten weeks. During the ten-week study period, participants' food intake increased by 25% and average weight increased by 2.2 pounds per person. These findings were published in 2013 in *Alzheimer Disease & Associated Disorders*.

"This study showed that people with advanced dementia responded to aquariums in their environment," said Dr. Edwards.

> **ATTRACTION TO THE NATURAL ENVIRONMENT IS SO INNATE THAT IT SURVIVES DEMENTIA. SO, PET THERAPY IS A PROMISING INTERVENTION EVEN FOR PEOPLE WITH ADVANCED COGNITIVE DECLINE.**

When it comes to animals' impact on physical health, some of the strongest evidence collected to date is on the association between pet ownership and cardiovascular health. For example, dog ownership has been associated with decreased cardiovascular risk and a longer life. Studies have suggested links between dog ownership and lower blood pressure, better lipid profile, and diminished sympathetic responses to stress – all helpful for decreasing cardiovascular risk.

A review and meta-analysis conducted by Dr. Caroline Kramer and colleagues, published in October 2019 in *Circulation: Cardiovascular Quality and Outcomes*, a journal of the American Heart Association, looked at the association between dog ownership and mortality. After reviewing ten studies involving more than 3.8 million people, they found that compared to non-owners, those who owned dogs experienced a 24% reduction in risk of all-cause mortality (i.e. deaths from all possible causes).

When the researchers looked at studies of cardiovascular mortality specifically, dog ownership was associated with an even larger reduction of risk (31%). These findings suggest that dog owners live longer and have lower risk of cardiovascular death, in particular.

INCONSISTENT FINDINGS

Animal lovers might be surprised to learn that research findings about the effects of human-animal interactions have been mixed, though, and the quality of the research conducted has varied widely from study to study, making it challenging to interpret the findings with confidence.

To help make sense of the collective body of research findings about animal interactions specifically with older adults, Dr. Nancy Gee and Dr. Megan Mueller conducted a review of 145 studies and shared their findings in 2019 in *Anthrozoös*. The studies examined the impact of pet ownership and animal-assisted interventions on many different variables, including cognition, physical health and exercise, and depression, loneliness, and social functioning, as well as anxiety, fear, agitation, and related behaviours.

Overall, the findings were stronger for studies that manipulated the presence of the animal (i.e. the intervention studies), while the pet ownership results tended to be mixed, with many studies showing positive effects on the variables, but others showing negative, mixed, or no effects. →

Animal-assisted interventions refer to animal-assisted activities that are often informal or recreational in nature (e.g. a resident cat living in a long-term care home, or volunteers visiting seniors with well-behaved, screened pets), as well as formal animal-assisted therapy, which involves goal-oriented, structured activities with animals that are delivered by trained professionals.

In addition to reviewing the findings from those studies, Dr. Gee and Dr. Mueller also assessed the quality of the research meth-odology used for each study. Many different methodologies were used, and not all of the research was rigorous. Examples of methodological shortcomings included small sample size and lack of control groups for comparison.

"Many of the research results were promising, particularly for animal-assisted interventions, showing potential for animals to positively impact the health and well-being of older adults," said Dr. Gee, a Professor of Psychiatry and Director of the Center for Human-Animal Interaction in the School of Medicine at Virginia Commonwealth University.

"Overall, the evidence indicates there is real potential for pet ownership to benefit older adults as well, but the evidence base is not as strong. More research needs to be done, particularly high-quality studies using robust methodology, so that we can flesh out the circumstances under which companion animals may be most beneficial."

"The inconsistency in the research findings reflects the reality that the relationship between humans and animals is complex. Despite some inconsistency in the research to date, we know enough at this point to say that animals have the potential to improve our lives in many ways," continued Dr. Gee.

> "ANIMAL-ASSISTED INTERVENTIONS, IN PARTICULAR, ARE BEING SCIENTIFICALLY TESTED AND THE EVIDENCE SEEMS TO INDICATE THAT THEY ARE EFFECTIVE IN HELPING INDIVIDUALS OF DIFFERENT AGES IN A WIDE VARIETY OF SETTINGS, INCLUDING IN SCHOOLS, LONG-TERM CARE HOMES, HOSPITALS, AND OTHER THERAPY SETTINGS.

ETHICAL CONSIDERATIONS

Although animals have much to offer that can help humans, it is important to remember that animals are equal partners in an animal-human interaction and must be treated with care and respect. This might mean, for example, that animals are never left unsupervised with young children in a classroom or with individuals who have dementia. Humans have an important role to play in the mental and physical health of animals, too.

EXERCISING HER MIND

STUDYING HOW SEX & EXERCISE AFFECT BRAIN HEALTH

If her academic career had not taken a turn, Dr. Cindy Barha might now be studying Catherine the Great and Ivan the Terrible instead of the mysteries of the brain. As an undergraduate student, she began studying Russian history, followed briefly by microbiology. But then, there was a moment of revelation while attending a biopsychology course. Her professor was discussing the ways in which estrogen influences the brain. Fascinatingly, there was a photograph in a textbook depicting a brain cell before and after the hormone was given.

> “
> **I WAS JUST BLOWN AWAY AT HOW THIS ONE HORMONE – AFTER JUST A FEW HOURS OF EXPOSURE – CAN COMPLETELY CHANGE THE WAY THIS BRAIN CELL LOOKED. AND BASICALLY I WAS HOOKED.**

There was a time when we thought our brains were static – that when a cell dies, it is irreplaceable. Now, scientists are exploring the notion of neuroplasticity, the ability of our brain to change and remodel itself in response to experience, influenced by factors like hormones.

The concept fascinated Dr. Barha. As a graduate student, she studied the use of hormone replacement therapy as a treatment for cognitive decline in older women. She examined the differences between the brains of women and men as they age, using rodent models for her research, with all of her work infused by an interest in women’s brain health.

When she completed her PhD, she wanted to explore different types of treatments and ultimately decided to focus on exercise. “It seemed like a great fit because we know it’s a lifestyle intervention for aging in terms of cognitive function and we also know that it impacts different hormones in the body. Exercise is also thought to increase plasticity, and so it checked all the boxes,” said Dr. Barha, now a post-doctoral fellow in the Department of Physical Therapy, Faculty of Medicine, at the University of British Columbia (UBC).

Now, she would have the opportunity to work with human beings instead of laboratory rats in a major research project co-funded by Brain Canada and the Alzheimer’s Association (U.S.). The project is supervised by Dr. Teresa Liu-Ambrose, Director of the Aging, Mobility, and Cognitive Neuroscience Laboratory at UBC’s Djavad Mowafaghian Centre for Brain Health. Dr. Liu-Ambrose also has an interest in brain health and was already studying the effects of exercise on the cognitive function of older women.

In her early work in the laboratory, Dr. Barha found that aerobic exercise seems to benefit certain kinds of cognition in women more than men. It is that difference between the sexes that is now at the heart of her latest research. Dr. Barha wants to understand why this disparity exists – a critical question as the scientific ⟶

community searches for therapies for Alzheimer's disease (AD) and other forms of dementia.

> **FOR ME, LOOKING AT SEX DIFFERENCES IN AD IS CRUCIAL BECAUSE WE KNOW MORE THAN TWO-THIRDS OF THE PEOPLE WHO HAVE THE DISEASE ARE WOMEN. IT WILL HELP US IDENTIFY THE UNIQUE RISK FACTORS FOR THE SEXES, DETERMINE WHETHER THE DISEASE PROGRESSES DIFFERENTLY IN MALE AND FEMALE BRAINS, AND WILL ULTIMATELY HELP US DISCOVER NEW EFFECTIVE TREATMENTS FOR AD THAT MAY BE SEX-SPECIFIC.**

Dr. Barha and her colleagues have recruited more than 200 individuals over the age of 65, each of whom have some level of confirmed cognitive impairment. The participants engage in exercise classes supervised by a certified instructor and, at various points in the study, give blood and saliva samples, as well as undergo a battery of cognitive tests and brain scans.

The pandemic, however, has greatly complicated matters. For a period of time, the exercise classes were being held remotely, with the participants connecting virtually with the instructors from their respective homes. When they were able to return to in-person training, it was in much smaller groups to allow for proper distancing.

Fortunately, recruitment for the study was never an issue. "Our participants really enjoy it and it's not hard for them to convince their friends to take part," Dr. Barha noted. Participants received virtual one-on-one fitness training, which provided an enjoyable break from the dreariness of pandemic restrictions.

> **OLDER ADULTS ARE STUCK AT HOME LIKE MANY OF US AND THE SOCIAL ASPECT OF OUR STUDIES IS REALLY IMPORTANT FOR THEM. IT'S A BONUS FOR THEM TO INTERACT WITH OTHER ADULTS AND OTHER STAFF MEMBERS.**

The numerous benefits of exercise for our mental and physical health have already been well-documented. Dr. Barha noted that if we can learn more about how exercise might serve as a treatment for dementia, it would be both cost effective and easy to access in the community. She cautioned, however, that before we can prescribe exercise as medicine, "it's imperative to maximize its beneficial effects by understanding how different factors such as the biological sex of the individual, the genetic makeup of the individual, and the type (and amount) of exercise can alter its efficacy."

Dr. Barha has faced her own personal difficulties with the study during the pandemic. Not only did she have to organize a major research project remotely, but she also had to take her 15-month-old son out of daycare for three months. As any parent would understand, having a child of that age at home made it exceedingly difficult to get any work done. Now, her son is back in daycare, and she is pregnant with her second child.

While Dr. Barha – like so many of us – copes with the pandemic and parenthood, she is grateful for her funders, whose support allowed her to broaden the scope of her research. "Without the support of Brain Canada, I wouldn't have the same level of freedom to ask the questions I want, particularly related to women's brain health."

This Project has been made possible with the financial support of Health Canada, through the Canada Brain Research Fund, an innovative partnership between the Government of Canada (through Health Canada) and Brain Canada, and of Alzheimer's Association USA. The views expressed herein do not necessarily represent the views of the Minister of Health or the Government of Canada.

IMPACT OF COVID-19 ON MENTAL HEALTH

IS A MENTAL HEALTH "TSUNAMI" DEVELOPING?

The coronavirus disease 2019 (COVID-19) is caused by a novel coronavirus strain, SARS-CoV-2. The "SARS" part of the virus strain name refers to "severe acute respiratory syndrome," which reflects the most serious symptoms associated with the virus (namely, difficulty breathing or shortness of breath). There is quite a long list of other physical symptoms that might be experienced, including chest pain or pressure, fever, dry cough, aches and pains, sore throat, headache, and loss of taste or smell (although some people experience no physical symptoms at all).

> **THE INITIAL, PRIMARY FOCUS DURING THE PANDEMIC WAS ON THE WIDE-RANGING PHYSICAL SYMPTOMS OF COVID-19, BUT AS TIME HAS GONE ON, RESEARCHERS ARE ALSO EXAMINING HOW THE ILLNESS MIGHT BE IMPACTING MENTAL HEALTH.** →

A flurry of research has been published in a short period of time, looking at the mental health effects on individuals who get the virus, as well as on those who do not get the virus but are indirectly affected through the many stresses and worries caused by the pandemic and our societal responses to it (e.g. stay-at-home orders, work and school closures, and restrictions on socializing and travel).

Public health emergencies may affect the health, safety, and well-being of both individuals and communities, causing feelings of confusion, emotional isolation, and stigma, as well as growing economic loss and inadequate resources for medical response. These effects may, in turn, translate into a wide range of emotional reactions (such as distress or psychiatric conditions) and unhealthy behaviours (such as excessive substance use).

IS THERE A TSUNAMI OF LASTING PSYCHOLOGICAL PROBLEMS DEVELOPING?

A lot has been written in the academic literature, health organization statements, and press coverage about the impact of COVID-19 on mental health, some of it suggesting that there may be a "tsunami" of mental health challenges developing. These claims were based on studies conducted in various countries around the world that were finding elevated levels of symptoms among the general population, as well as specific sub-groups.

Such findings are probably not surprising to most people. One might reasonably expect that such a highly stressful event that impacts our lives in so many ways would have mental health repercussions.

According to recent data collected through a nationwide monitoring survey on the mental health impacts of COVID-19, released on December 3, 2020 by the Canadian Mental Health Association in partnership with the University of British Columbia,

> **THE SECOND WAVE OF THE PANDEMIC HAS "INTENSIFIED FEELINGS OF STRESS AND ANXIETY, CAUSING ALARMING LEVELS OF DESPAIR, SUICIDAL THOUGHTS, AND HOPELESSNESS IN THE CANADIAN POPULATION."**

The survey, which was conducted in September 2020, involved a representative sample of 3,027 people (ages 18 and up) residing in Canada. Of great concern was the sharp increase in suicidality in the fall of 2020, with one in ten Canadians (10%) experiencing recent thoughts or feelings of suicide, up from 6% in the spring of 2020 and 2.5% throughout pre-pandemic.

The survey suggests that suicidal thoughts and feelings are even higher in various subgroups of the population, including those who identify as LGBTQ2+ (28%), those with existing mental illness or mental health issues (27%), those with a disability (24%), those between the ages of 25 and 34 (21%), and those who are Indigenous (20%).

Additionally, more than one third (39%) of the participants indicated that they were worried about their finances, with half of parents with children under the age of 18 and those with a household income of less than $25,000 (51%) reporting financial concerns due to COVID-19. Additionally, over one quarter (27%) of parents worried about putting food on the table and nearly one fifth (18%) were concerned about being safe from physical or emotional domestic violence.

A narrative review of the existing literature on mental health symptoms and interventions relevant to the COVID-19 pandemic – published in the August 2020 issue of *Asian Journal of Psychiatry* – found that symptoms of anxiety and depression (16-28%) and self-reported stress (8%) appear to be common psychological reactions to the pandemic and may be associated with disturbed sleep.

The author concluded that although the quality of evidence in the available literature is relatively low, it still contains numerous valuable observations and suggestions for all professionals working in this field, whether they are associated with psychiatric or general hospitals or working in the community.

MORE RESEARCH IS NEEDED

Some researchers and medical professionals caution against making sweeping claims about the long-term impact of the pandemic on mental health, as much more research is required. In a blog series for *Psychology Today*, Dr. Michael Scheeringa, Professor and Vice-Chair of Research for Psychiatry at Tulane University Medical School, noted that we should

> **AVOID USING THE RESEARCH COMPLETED SO FAR AS THE BASIS FOR ANY BROAD CLAIMS ABOUT DEVASTATING MENTAL HEALTH IMPACTS OF THE PANDEMIC. WE NEED TO BE CAREFUL NOT TO OVERHYPE THESE FINDINGS.**

During Dr. Scheeringa's review of some of the research published in 2020, he found that in three population groups (namely, the general population, those who experienced COVID-19, and healthcare workers), the participants showed higher average rates of anxiety, depression, and post-traumatic stress disorder during the pandemic compared to pre-pandemic and, in many cases, substantially higher rates. However, in his view, there were a number of limitations in the research that should be taken into account when interpreting the results:

- the studies involved self-administered questionnaires, which are prone to inflation of symptoms because respondents may give answers that they believe the researchers are looking for, as well as inaccurate answers because the respondents may misunderstand questions when reading and interpreting them independently;
- all respondents self-selected to participate in the research, meaning the pool of participants was not a randomized sample representative of the group being studied;
- almost all of the studies were cross-sectional (which is a study design that examines data from a group of participants at a single point in time), and therefore the findings cannot demonstrate cause and effect, but rather provide a quick look at correlations that may exist; and
- the studies only asked about symptoms and did not measure whether those symptoms were having an impact on day-to-day functioning (in the psychiatric community, there is a general consensus that functional impairment must be present in order for a person to have a mental health "problem" or to be considered as officially having a diagnosed disorder).

Dr. Scheeringa also noted that the research was conducted and published particularly fast. "Overall, a large number of studies were conducted in 2020 about this topic, and the results were analyzed and shared very quickly. It makes sense that researchers and academic publications wanted to conduct research and share findings in a timely way, but a downside to rushing can be lower quality research and lower peer-review standards, and that should be kept in mind when interpreting the findings," explained Dr. Scheeringa.

Much more research is needed in order to evaluate the true impact of the pandemic on mental health.

> **IT IS IMPORTANT TO KEEP IN MIND THAT HUMANS ARE BY NATURE QUITE RESILIENT, MEANING MOST PEOPLE WHO EXPERIENCE EVEN EXTREME STRESSORS AND TRAUMA WILL NOT END UP WITH A LONG-TERM MENTAL ILLNESS.**

RESEARCH IS UNDERWAY INTO THE POSSIBLE LONG-TERM NEUROLOGICAL IMPACTS OF COVID-19

As the COVID-19 pandemic continues, there is growing evidence that the virus is having a negative impact on the central nervous system (i.e. the brain and the spinal cord). Some of the short-term COVID-19 symptoms that suggest effects on the central nervous system include headache, reduced ability to taste and smell, and delirium.

Post-mortem brain scans of individuals who had COVID-19 have found virus particles in the brain, while brain scans of those hospitalized with COVID-19 are showing brain abnormalities that may be from immune reactions to the virus, seizures, or lack of oxygen. These short-term effects on the brain have the potential to contribute to psychiatric disorders, affect cognitive function, and possibly even increase the risk of Alzheimer's disease or Parkinson's disease in the long term.

An international research study – entitled "SAR-CoV-2 Impact on Behavior and Cognition" – is underway to examine these potential long-term impacts on the brain. Scientific leaders from the Alzheimer's Association and representatives from more than 25 countries are collaborating on this study, with technical guidance from the World Health Organization (WHO). They are expecting to study more than 22 million COVID-19 cases around the world as part of this comprehensive research.

TIPS FOR STAYING MENTALLY HEALTHY DURING THE PANDEMIC

While it is unclear whether the COVID-19 pandemic will bring about a "tsunami" of mental health challenges, one thing is certain: many people are experiencing at least short-term increases in stress and anxiety during these unprecedented times. Now more than ever, it is critical to engage in mentally healthy activities, which may require some creative new tactics. Below are some helpful tips for staying mentally healthy during the pandemic.

- Exercise is essential to strong mental (and physical) health at any time. During the pandemic, it remains a powerful tool for dealing with stress, but you may need to alter your normal workout routines due to the closure of public fitness facilities. Luckily, walking and running outdoors are fantastic options that are possible even during the pandemic. Other home-based options that do not require much (or any) equipment include yoga, dancing to your favourite music, and calisthenics (strength training using your own body weight).

- Healthy eating is another key contributor to mental health. Try cooking homemade meals from scratch, but choose recipes that emphasize healthy, whole food ingredients that will nourish your mental and physical health.

- Meditation is another powerful tool for managing stress. There are many different types of meditation, and numerous resources available online to support you as you learn about and practice meditation (some free of charge).

- There are several creative activities that can be done alone, at home, with minimal or no supplies or equipment. Perhaps you will start journaling or writing poetry or pick up that guitar or ukulele that has been gathering dust in the corner and start playing again, or maybe you will take an online course to learn something completely new, such as drawing or photography.

- Use technology to stay socially connected with friends and family virtually. This could be as simple as participating in a group video chat using a platform such as Zoom or Skype, or even planning a virtual game night (a quick online search for "virtual social games" will reveal plenty of fun options, some free.) Do beware, though, of the potential downside of too much screen time.

- Seek professional help if you need it. Early in the pandemic, many mental health care providers pivoted quickly to provide services virtually so there are several options for accessing the care you need from the comfort and safety of your own home (for example, by video or telephone, texting, email, smartphone apps, and online forums).

ON THE REBOUND

RESILIENCE AS A PRACTICE, NOT A PERSONALITY TRAIT

Resilience is a complex concept. As a society, we generally have positive associations with the idea of being resilient, but it is difficult to define exactly what resiliency is, and what makes someone resilient.

If you are not quite sure how to define resilience, you are not alone. Psychologists have also been changing the ways in which resilience is defined and understood over time.

"Prior to 2005, resilience was mostly defined in terms of severe hardships, trauma, and adversity, and being able to overcome and adapt your life to that," noted Dr. Mary Karapetian Alvord, a Psychologist and Director at Alvord, Baker & Associates. "But there are so many challenges in life that would not be considered severe adversity, and people have a whole host of problems they need to adapt to."

According to a recent study published in the *European Journal of Psychotraumatology* in 2020 led by Dr. Christy Denckla, there has also been a documented move away from thinking about resilience as an individual personality trait, a point that is also reiterated on the American Psychological Association's website. Psychologists are now approaching resiliency as a dynamic process, which involves positive adaptation to difficult circumstances.

Since resiliency is a dynamic process, a person is not simply resilient or not resilient. As Dr. Alvord explained,

> **YOU MAY NOT ALWAYS BE RESILIENT IN EVERY ASPECT OF YOUR LIFE, OVER THE COURSE OF YOUR ENTIRE LIFE.**

For many people, resiliency is something that can be learned and developed. It is also a continuous journey that requires practice. The ability to learn resilience is one of the reasons why research has shown that resilience is ordinary, not extraordinary. ⟶

FACTORS THAT CAN IMPACT YOUR RESILIENCE

There are many different internal and external factors that can impact your resilience. Psychologists and scholars refer to them as the "protective factors" of resilience and they include, amongst other things, valuing your achievements, controlling what you pay attention to, and fostering meaningful connections.

In an informative conversation with Mind Over Matter® about resilience, Dr. Alvord highlighted three key factors for developing resilience: practicing self-advocacy, avoiding "catastrophizing," and recognizing special talents and abilities.

1. PRACTICE SELF-ADVOCACY

Self-advocacy includes believing that you have the ability and power to make things happen in your life. "While there are many things you can't control, there are some things you can control," noted Dr. Alvord.

TIPS FOR BUILDING RESILIENCE

The American Psychological Association's (APA) website contains a list of various tips for building resilience. Although the APA's advice is aimed at children and teenagers, Dr. Alvord suggests that the following tips are also incredibly relevant to adults:

1. Making connections – this helps to build social skills and build empathy;
2. Helping others – this can be empowering;
3. Maintaining a daily routine – this provides comfort;
4. Taking a break – use time to reflect and consider the worst-case scenario;
5. Practicing basic self-care – this helps you cope with stressful times;
6. Moving towards your goals – try breaking them down into small, achievable actions;
7. Nurturing a positive self-view – remember the ways that you have handled past hardships;
8. Keeping things in perspective and maintaining a hopeful outlook – consider the broader context;
9. Looking for opportunities to learn about yourself – what did you learn after facing a tough situation; and
10. Accepting change – do not be afraid to reevaluate your goals.

For full details on this list of helpful tips, please visit: https://www.apa.org/topics/resilience/guide-parents-teachers.

> RATHER THAN BEING PASSIVE OR FEELING HELPLESS, BELIEVING THAT YOU CAN IMPROVE YOUR OWN LIFE IS A CORE FACTOR IN BEING RESILIENT.

Once you realize that you have the ability to make things happen, it is important to be proactive, take initiative, and be a problem solver to help overcome the challenges and setbacks you are encountering.

2. AVOID "CATASTROPHIZING"

Catastrophizing occurs when you assume that the worst will happen. This can be overwhelming and can lead to negative physical reactions such as anxiety, as well as stop you from self-advocating.

To avoid catastrophizing, Dr. Alvord suggests looking at challenges as distinct problems. For example, if you have a bad interaction with someone, do not assume that she or he dislikes you, or that your entire relationship is terrible. Instead, try viewing the experience as one negative interaction and find ways to address it.

Additionally, consider how you would help a friend who had a similar problem or concern.

> WHATEVER ADVICE YOU WOULD GIVE TO THAT FRIEND, GIVE TO YOURSELF AS WELL. IT IS LIKELY GREAT ADVICE.

Lastly, Dr. Alvord and colleagues recommend that you consider the worst-case scenario. Although this may sound counterintuitive, it can help to challenge unrealistic thinking and put matters into perspective.

3. RECOGNIZE SPECIAL TALENTS & ABILITIES

When you are in a situation that requires resilience, it is important to be able to trust yourself and recognize the talents and abilities that you possess.

> ACKNOWLEDGING THE THINGS THAT YOU ARE GOOD AT CAN FOSTER A POSITIVE SELF-IDENTITY AND PROMOTE RESILIENCE THROUGH HIGHER SELF-ESTEEM AND CONFIDENCE.

This is especially true if those talents and abilities do not comprise part of your daily activities or practices. For example, if you are struggling to keep up at your workplace, remember that "work isn't everything to all people," noted Dr. Alvord. "It's helpful to find ways to remind yourself of your special talents and abilities, and focus on incorporating them into your job."

COMMUNITY CONNECTIONS

Practicing resilience can be made easier when you have a supportive network of family, friends, and/or community members to support you. The importance of social connectivity to resilience has been highlighted in the academic literature, and in Mind Over Matter®'s interview with Dr. Alvord.

"Your network doesn't have to be huge, but you need a couple of people in your life with whom you have meaningful relationships," said Dr. Alvord.

RESILIENCE IS NOT A SOLITARY JOURNEY. YOU SHOULD SEEK HELP, AND OFFER HELP, AND NOT TRY TO DO IT ALONE.

Of course, it is not just up to individuals to practice resilience. More recently, the study of resilience has also been expanded to include a community-level perspective to understand the systems that impact resilience and development. For example, researchers have identified participation and belonging in faith-based communities, as well as access to effective school supports, health services, and economic opportunities, as protective factors of resilience.

While individuals can learn and practice resilience, putting supportive systems in place can help build resilient communities where individuals are faced with fewer situations that require resilience.

HELLO BEAUTIFUL

HOW POSITIVE ARE "POSITIVE AFFIRMATIONS"?

You may have heard about the power of affirmations. There has been much hype in both the self-help world and the media about the ways in which repeating positive statements to yourself can help with everything from physical healing and enhancing your self-esteem to improving relationships and achieving career success, and more.

Perhaps you are already using this simple technique – saying phrases to yourself throughout each day such as "I am in perfect health," "I am calm and safe," or "I attract more and more abundance into my life each day."

> **ARE YOU SKEPTICAL OF THIS PRACTICE AND/OR BELIEVE THAT IT MAY FEEL ODD OR UNNATURAL?**

Or perhaps you believe that it is a futile exercise to talk to yourself in this manner.

So, do affirmations actually work? The limited research on this topic suggests that affirmations may work for some, but not for others, with its efficacy depending on a variety of factors. In some instances, though, this technique may make individuals feel worse instead of better.

In this article, we will review some historical highlights about the roots of this popular technique, as well as some of the scientific research on this practice.

HISTORICAL HIGHLIGHTS: HOW DID AFFIRMATIONS BECOME SO POPULAR?

Émile Coué, a French pharmacist and self-trained therapist, has been called the "father of affirmations." In the early 1900s, he was teaching clients and promoting to the public a technique he referred to as "conscious autosuggestion," which he described as a form of self-hypnosis that involved using your imagination to affect your "moral and physical being."

He is most well-known for his promotion of one particular positive statement:

> **EVERY DAY, IN EVERY WAY, I AM GETTING BETTER AND BETTER.**

He claimed that this statement could help everyone, regardless of one's condition or concern, if it was repeated quietly 20 times each morning and evening "in a natural way" and "with firm conviction."

In his 1922 book, *The Coué 'Method': Self Mastery Through Conscious Autosuggestion*, Coué shared client case studies and claimed that conscious autosuggestion helped "cure" his clients of a wide range of conditions, including eczema, varicose veins, asthma, and gout.

TERMINOLOGY

There are many forms of **self-talk**. For example, self-talk can be positive, negative, or neutral; motivational or demotivational; broad or specific; deliberately chosen or automatic.

This article focuses on one form of self-talk known as "affirmations," specifically as described in popular self-help literature. In this context, an **affirmation** is typically described as a positive phrase, consciously selected, which you repeat to yourself frequently (either silently or out loud) with the intention of improving your physical or emotional health, behaviour, thoughts, and/or beliefs about yourself. The phrase may be something that you initially consider false. The underlying premise is that what you believe (and what you tell yourself) matters, and you have the ability to consciously choose some of your thoughts and thereby improve your life.

In research literature, this type of intervention may be referred to by a different term such as a **positive self-statement**.

Another prominent figure who promoted the use of affirmations was Paramahansa Yogananda, a well-known spiritual teacher and yogi from India. He began introducing the practice to American audiences during his first intercontinental speaking tour in 1924. He would often begin or conclude his inspirational services by leading a group affirmation of some kind, which involved collective chanting of a chosen phrase.

In his book, *Scientific Healing Affirmations*, he describes a practice of individual affirmations that he claimed could heal the mind and body. In particular, he said poetically that "[w]ords saturated with sincerity, conviction, faith, and intuition are like highly explosive vibration bombs, which, when set off, shatter the rocks of difficulties and create the change desired."

Like Coué, Yogananda recommended practicing affirmations first thing in the morning and before going to sleep at night, though his recommended method differed.

> **SAY YOUR AFFIRMATION LOUDLY AT FIRST AND THEN GET QUIETER AND SPEAK MORE SLOWLY OVER TIME UNTIL YOU ARE JUST WHISPERING.**

He provided numerous examples of different affirmations, which tended to have a spiritual emphasis, and were often comprised of multiple sentences (for example, "I am submerged in eternal light. It permeates every particle of my being. I am living in that light. The Divine Spirit fills me within and without.").

More recently, author and speaker Louise Hay brought more attention to the concept of affirmations through her work, including her best-selling 1984 book, *You Can Heal Your Life*. In that book, Hay shared her philosophy and beliefs about healing oneself, noting (amongst other things) that "every thought we think is creating our future" and that thoughts can be consciously altered through frequent repetition of positive affirmations.

Her philosophy was based, in part, on her own life experiences and observations from working with clients. She promoted the practice of using different positive affirmations depending on what you wanted to change. Hay was a profuse writer of affirmation statements, with some appearing in her books and others captured on decks of cards with names like "Power Thought Cards" and "How to Love Yourself Cards." She also has various affirmation statements on her website, including "I trust the process of life," "I am loved and at peace," and "Perfect health is my Divine right, and I claim it now."

RESEARCH HIGHLIGHTS: WHAT HAVE EXPERIMENTS SHOWN ABOUT AFFIRMATIONS?

Historical claims about the power of affirmations were not necessarily based on robust research, but instead often relied upon anecdotal evidence and/or spiritual belief. More recently, though, researchers have conducted experiments investigating affirmations as an independent practice (i.e. conducted alone, as opposed to being part of therapy sessions with a professional), in order to develop a better understanding of what does (and does not) work.

In a 2009 study conducted by Dr. Joanne Wood and colleagues (published in *Psychological Science*), the researchers set out to test their hypothesis that, rather than boost mood and enhance self-esteem, positive self-statements can be ineffective or even harmful. One of their experiments involved testing the effects of a specific positive self-statement, repeated often, for a short period of time (i.e. during the course of the experiment, as opposed to every morning and/or every night).

The researchers randomly assigned 68 university students to either a self-statement group or a "no-statement" group. Participants in both groups were asked to write down all of their thoughts and feelings during a four-minute period. Those in the self-statement group were also asked to simultaneously repeat to themselves "I am a lovable person" every time they heard a bell, which rang every 15 seconds (for a total of 16 times). ⟶

State self-esteem refers to a person's self-opinion at a particular point in time, in response to a particular situation, while **trait self-esteem** refers to a person's overarching self-opinion developed over long periods, which tends to remain stable.

After the four-minute writing task, all participants completed three measures – two to assess mood and one to assess "state" self-esteem. Analyses revealed that when individuals with chronically low self-esteem repeated the positive self-statement, neither their feelings about themselves nor their moods improved. In fact, they got worse.

"Although this study was small, it matches other studies we've done, which together contradict the popular notion that thinking positively makes everyone feel better. Positive self-statements seemed to provide a boost only to those who already had high self-esteem, and that boost was small," said Dr. Wood, a Professor of Psychology at the University of Waterloo.

"We suspected this would happen because of other research around a concept called 'latitudes of acceptance,' which suggests that messages consistent with your current attitude are more persuasive than ones that are inconsistent. In other words, if you try to tell yourself something that you don't believe is true, like 'I am lovable' if you think you're not, then that thought will meet internal resistance. You might begin to think of the ways that you're not lovable. So, using affirmation statements that are inconsistent with your beliefs about yourself can backfire and cause you to feel worse about yourself, potentially making your original negative belief more firmly entrenched."

Dr. Wood's research has received much worldwide attention since it was published. Her team's findings about the potential downside to positive thinking were a surprise to many people, but not all. As the public began hearing about her research findings in the news, some reached out to Dr. Wood directly to share their personal stories about how they had tried to follow the instructions in self-help books to change their lives through the use of positive affirmations but got frustrated or depressed when the practice was unsuccessful.

"I was pleased to hear that our research findings reassured people that there is nothing wrong with them if they found that positive self-statements didn't work," said Dr. Wood.

> **THE PUBLIC NEEDS TO BE AWARE THAT ALTHOUGH POSITIVE SELF-STATEMENTS MAY BE BENEFICIAL SOMETIMES, THEY ARE NOT A ONE-SIZE-FITS-ALL TOOL, AS MANY SELF-HELP BOOKS SUGGEST.**

A different group of researchers – Dr. Ioana Cristea and colleagues – also conducted an experiment to test the effects of self-statements on mood and self-esteem, using a study design that expanded on the research of Dr. Wood and colleagues. The research team sought to examine whether the type of positive self-statement used might affect the findings. To do this, the researchers divided participants into four groups, each using a different type of statement:

1. A general positive self-statement group, who repeated the same statement used in Dr. Wood's research ("I am a lovable person");
2. A specific positive self-statement group, who repeated "I am a very good, intelligent, and valuable person;"
3. An unconditional acceptance group, who repeated "I unconditionally accept myself as a person, with qualities and flaws;" and
4. A negative self-statement group for comparison, who repeated "I am unlovable."

Dr. Cristea's research team also considered whether the events immediately preceding the use of a positive self-statement might affect the outcome. Since positive affirmations are often recommended as a tool for coping with stressful experiences, the experiment was designed to include an uncomfortable scenario before participants completed a four-minute writing exercise, in which participants recorded their thoughts and feelings while using their assigned self-statements every time they heard a bell (following the same pattern as in Dr. Wood's experiment – every 15 seconds, for a total of 16 times).

In this study, 90 university students were randomly assigned to one of the above-noted groups, and all participants completed measures of mood and self-esteem at the beginning of the experiment. Then, the participants all completed an activity intended to threaten their self-esteem: writing a letter to university administration asking for the termination of scholarships for socially disadvantaged students (i.e. an act of unfounded lack of compassion).

Next, they all completed the four-minute writing exercise, with each of the four groups thinking about their assigned self-statement when the bell rang. Finally, all participants repeated the self-esteem and mood evaluations at the end of the experiment.

The results were published in March 2014 in *Journal of Evidence-Based Psychotherapies*. Overall, both of the positive self-statements led to higher state self-esteem and less negative emotions compared to the negative self-statement, after the challenging situation.

> **THE UNCONDITIONAL SELF-ACCEPTANCE STATEMENT DID NOT PROVIDE ANY IMMEDIATE BENEFIT FOR STATE SELF-ESTEEM OR MOOD.**

Interestingly, among individuals with high trait self-esteem, repeating a positive or negative self-statement appeared to make little difference. For those with relatively low trait self-esteem, though, the global positive self-statement was more effective at reducing negative emotions than the specific positive self-statement (perhaps because the specific statement may have sounded exaggerated to some participants).

These findings suggest a potentially more complex and somewhat different picture compared to what was reported in the study conducted by Dr. Wood and colleagues. It could be that in a neutral situation (like the one in Dr. Wood's experiment), positive self-statements are not useful for people with low trait self-esteem, but that in stressful circumstances (like the one in Dr. Cristea's experiment), people with low trait self-esteem can benefit from positive self-statements.

However, it is important to keep in mind that Dr. Wood's research was comparing a positive self-statement to no self-statement at all, while Dr. Cristea's research was comparing positive versus negative self-statements, so the findings from the two studies are not directly comparable. It should also be noted that both of these studies involved a small number of participants who represented just one population group (university students) and tested only limited types of positive self-statements used in a particular way.

Accordingly, more research is needed in order to determine what types of affirmation might (or might not) work - particularly well-designed, robust studies - before conclusions and recommendations can be confidently made regarding the efficacy of this technique.

SO, SHOULD I GIVE AFFIRMATIONS A TRY?

Clearly, there is much more to be learned about affirmations, since the research conducted to date merely scratches the surface. Affirmations, like most inner experiences, are challenging to study scientifically. What happens inside a person's head is difficult to observe and control by a researcher.

Moreover, there are so many potential variables that could impact whether or how an affirmation works. For example, what are the best phrases to use? Does it make a difference how many times you use the affirmation in a day, or when you use it, or for how many days? Does it make a difference if you say the phrase silently or out loud? Does it matter if you say the words quickly or slowly? Is it important to visualize or evoke particular feelings while you are thinking of the words? Do affirmations work better for some people than others, or for different purposes better than others?

> **ALTHOUGH YOU CAN FIND VARIOUS RECOMMENDATIONS FOR DIFFERENT "FORMULAS" FOR SUCCESSFUL AFFIRMATIONS IN THE SELF-HELP LITERATURE, THOSE RECOMMENDATIONS ARE NOT NECESSARILY EVIDENCE BASED.**

BEWARE OF VICTIM-BLAMING

Recent research conducted by June Chun Yeung – published in April 2020 in The Journal of Positive Psychology – warned that some of the practices recommended in popular self-help materials can lead to victim-blaming. She describes how scholars have expressed concerns, for example, that an overemphasis on positivity can have detrimental effects, leading people to believe that their challenges or illnesses could be overcome if they could just change their way of thinking. In other words, if they do not get better, then it is their own fault.

Ms. Yeung's research examined how the popular notion that positive self-statements can improve your well-being may heighten a person's tendency to blame those who experience depression, in particular. She found a small yet robust effect overall in her experiments, suggesting that beliefs in such non-evidence-based self-help materials was contributing to victim-blaming.

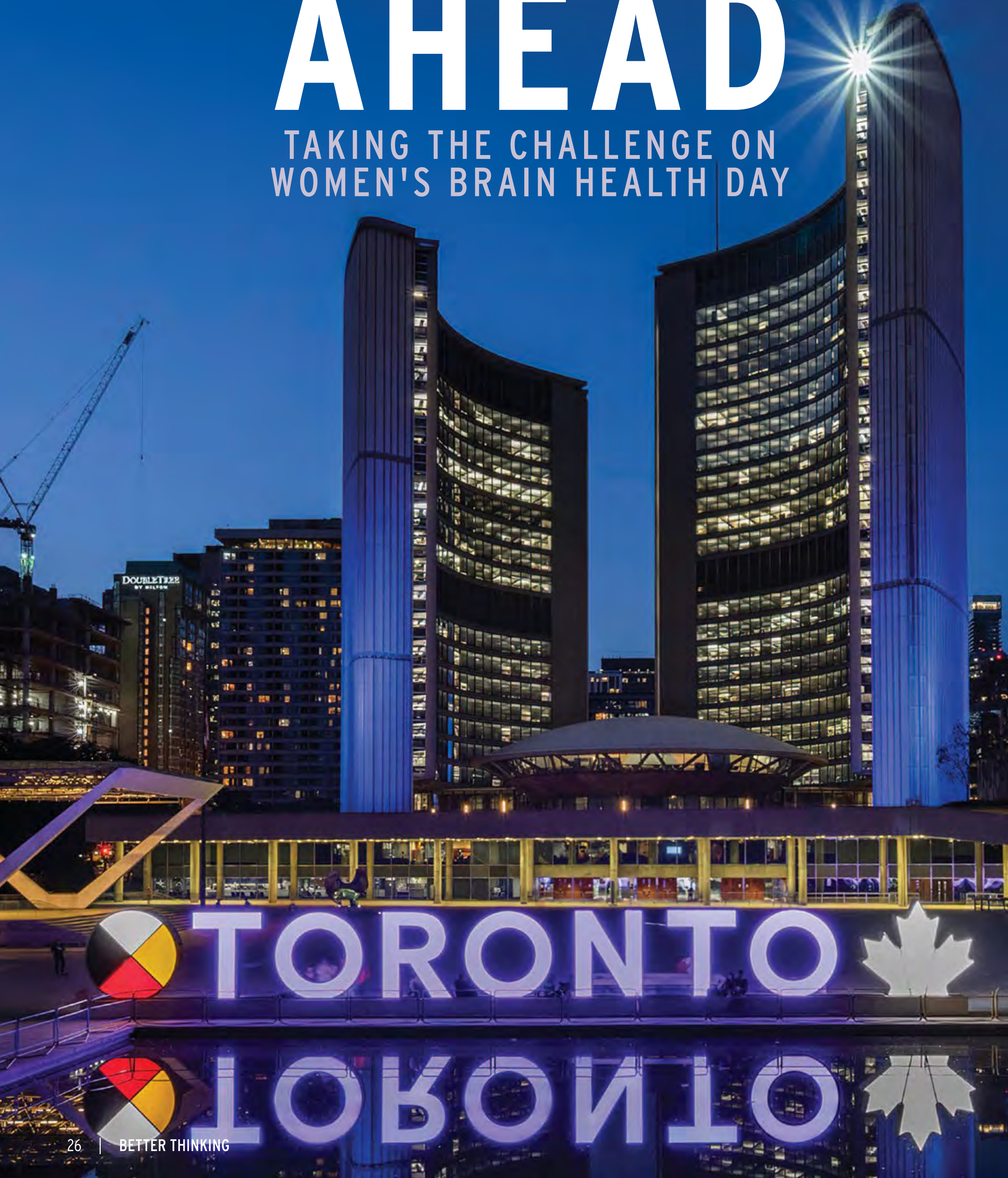
"It would not be feasible nor desirable to ban the use of this type of self-help tool, as positive self-statement practices may be helpful for some people," said Ms. Yeung, a Research Fellow at Lingnan University in Hong Kong. "However, it's important for people who promote the use of such practices to be transparent about the evidence upon which their recommendations are based and provide balanced descriptions of the effectiveness. By not overhyping things, they will help raise awareness that while their tools may work for some, they may not work for everyone, thereby helping reduce any unintended but very real and damaging victim-blaming."

Given that positive affirmations have shown some promise in the early research (and there are ample examples of anecdotal enthusiasm about the practice), it might be worth giving them a try if they appeal to you. They offer the possibility of a free and simple tool to potentially help improve many aspects of your life. Most people engage in some form of silent self-talk anyway, whether they are aware of it or not, so the use of affirmations can be considered an extension of that - but doing so in a conscious and positive way.

You may want to experiment with incorporating positive affirmations into your daily routine; just be sure to pay attention to how they make you feel. If they make you feel worse instead of better, try adjusting something about your practice or discontinue it altogether. Also, keep in mind that although there is much hype around the use of affirmations, there is no guarantee that this practice will result in instant healing or success, and the reality is that it may not work for everyone.

STAND AHEAD®

TAKING THE CHALLENGE ON WOMEN'S BRAIN HEALTH DAY



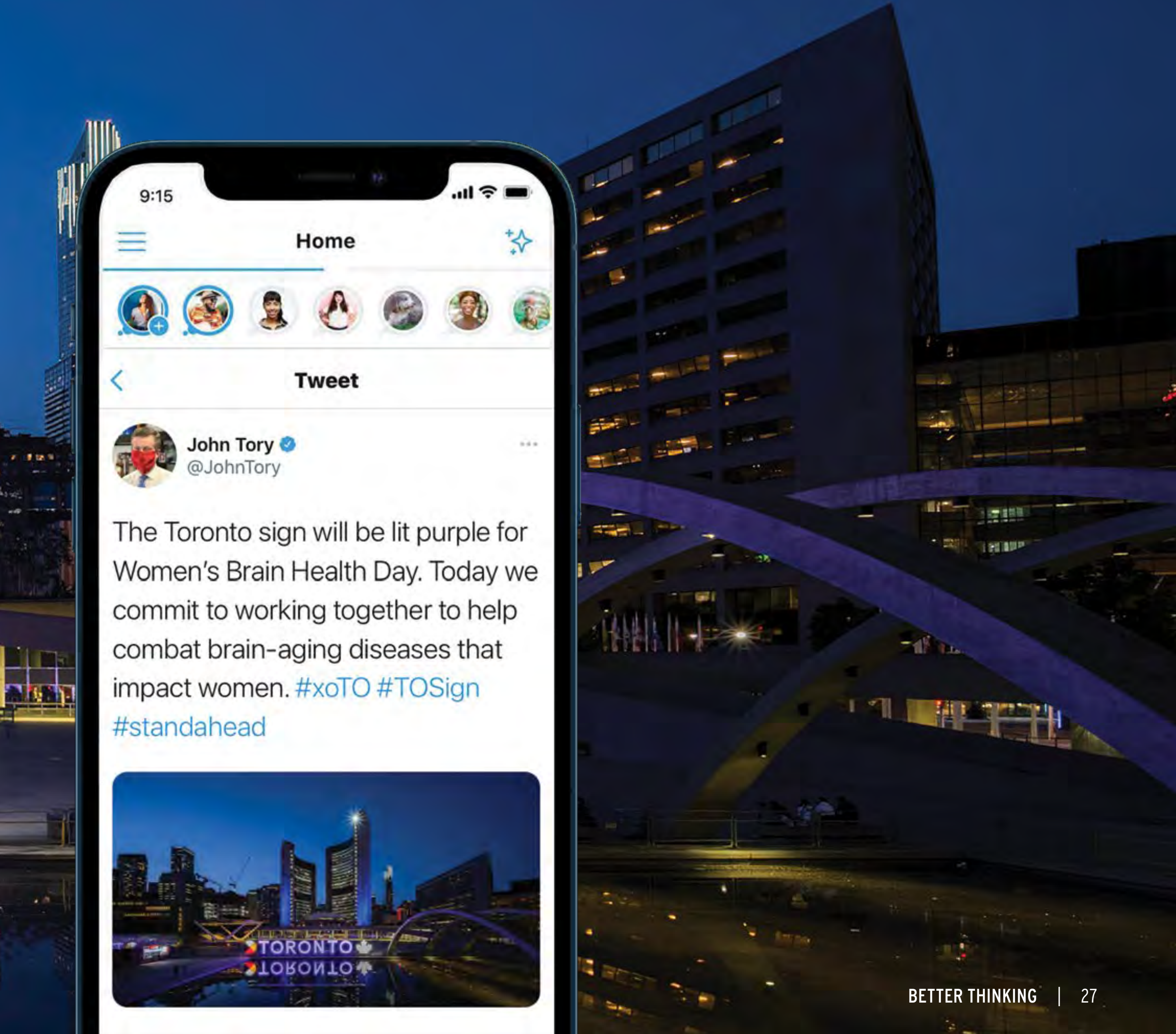
The second Women's Brain Health Day was both memorable and inspiring. It came in the midst of a global pandemic that upended all of our lives. Like everyone else, the team at Women's Brain Health Initiative (WBHI) was forced to adapt. The charitable organization had a major annual fundraiser to host at a time when in-person events were impossible. And so it was quite remarkable that on the evening of December 2, 2020, over 1,500 supporters from across North America joined together (from the comfort of their respective homes) to share important messages for the cause of women's brain health.

Hosted by CTV's Anne-Marie Mediwake and Pattie Lovett-Reid, the live virtual event featured scientific insights from leading researchers such as Dr. Gillian Einstein and Dr. Nicole Gervais, as well as words of wisdom and support from a cross section of women and men of great accomplishment, including acclaimed actors Marcia Gay Harden and Peter Gallagher, and broadcaster Katie Couric. The event also featured special musical performances by Beverly Mahood, Sean Jones, Chantal Kreviazuk, and Amy Sky.

> SPEARHEADED BY WBHI, DECEMBER 2ND WAS OFFICIALLY DECLARED WOMEN'S BRAIN HEALTH DAY IN 2019 BY THE GOVERNMENT OF CANADA AS AN OPPORTUNITY TO HIGHLIGHT THE IMPORTANCE OF BRAIN HEALTH AND THE NECESSITY OF INCORPORATING SEX AND GENDER CONSIDERATIONS INTO RESEARCH.

Federal Health Minister Patty Hajdu helped kick off the event, noting that Women's Brain Health Day is "a very important day to acknowledge the research and the need for more to understand why women are disproportionately affected by brain-aging disorders like Alzheimer's disease and dementia."

Toronto Mayor John Tory also delivered a message in support of the cause and announced that the City of Toronto sign →



John Tory
@JohnTory

The Toronto sign will be lit purple for Women's Brain Health Day. Today we commit to working together to help combat brain-aging diseases that impact women. #xoTO #TOSign #standahead

in Nathan Phillips Square would be lit up in purple to mark the occasion. In a Twitter post, he said: "Today we commit to working together to help combat brain-aging diseases that impact women."

The day also featured the second annual Stand Ahead® Challenge, with this year's challenge being a memory task devised by Laura Tramontozzi during long hours of card playing throughout the pandemic lockdown. Participants were asked to examine seven playing cards for ten seconds, and then turn them over and try to recall them all – not an easy feat.

As always, at the heart of the initiative was fundraising to support research and educational programs that better support the needs of women. For the second year in a row, WBHI's valued partner Brain Canada generously matched all donations for women's brain research up to $250,000.

"By funding projects that effectively address sex and gender differences, Brain Canada aims to support research that is generalizable to everyone and will ultimately enable the development of new diagnostics and/or interventions for a more diverse group of people in Canada," said Dr. Viviane Poupon, President and CEO of Brain Canada.

THANKS TO MANY EXTRAORDINARILY GENEROUS DONATIONS, WBHI SUCCESSFULLY RAISED $750,000.

The money is already being put to good use, funding a variety of research projects on sex and gender across the country.

WBHI and Brain Canada are also collaborating with the Canadian Institutes of Health Research (CIHR) to support up to three Canadian research teams to compete for funding from the European Union's prestigious Joint Programme on Neurodegenerative Disease Research (JPND). JPND recently launched an international call for research projects to explore new ways of detecting Alzheimer's and other neurodegenerative diseases at an earlier stage. WBHI, Brain Canada, and CIHR are providing up to $999,000 to support Canadian proposals, which will include sex and gender analysis as a crucial element.

"The research community has gone through this realization that we need to better design research, we need to be more inclusive, and we need to take into account the patients and their perspectives," said Dr. Poupon.

"Whether it's a woman or a man, the symptoms can be different. The way you are going to share that you aren't feeling well with your doctor can be different. From research to the clinic, we need to consider this perspective that women and men are different. Integrating a sex and gender lens in research is critical in order to improve the way health interventions are designed, measured, analyzed, reported, and implemented."

"Canada has already become a world leader in the emerging field of sex and gender research," said WBHI Founder and President, Lynn Posluns.

"We're proud to work with our partners to support a new opportunity for our brilliant researchers to shine on the international stage."

In the first two years of Women's Brain Health Day, more than $1,000,000 has been raised for research and $250,000 for education. WBHI is in the process of creating a new series of educational initiatives, focused on preventative health, which will be unveiled in the months to come.

The planning is already underway for this year's Women's Brain Health Day and the Stand Ahead® Challenge, with more details to follow soon. In its short history, it has already become a powerful tool for standing up against research bias and raising awareness to combat brain-aging diseases that disproportionately affect women.

HEAD START

BRAIN CANADA'S FUTURE LEADERS GRANTS

When it comes to funding, young scientists face a classic Catch-22: they need funding to support their research projects, but major funders typically require preliminary data to support their grant applications.

That is the challenge Dr. Janelle Drouin-Ouellet faced when she wanted to work on an innovative technique that would help expand our knowledge of Parkinson's disease. Until now, most researchers have used animal models or models derived from stem cells to investigate the potential causes of Parkinson's, and ways to treat or prevent it. Neither method, though, provides an accurate way of studying age as a risk factor for this neurodegenerative disease. →

DR. DROUIN-OUELLET

Dr. Drouin-Ouellet, an Assistant Professor at the University of Montreal, has developed an out-of-the-box method that involves converting skin cells into brain cells (a technique known as direct neuronal reprogramming), and studying the age at which survival systems within brain cells begin declining. Accessing such cells directly from the brain is nearly impossible, so she would be creating a new tool for studying disease mechanisms, which hopefully could lead to new therapies.

But getting started was not easy.

"I did not have any proof of principle that it could work, which means that other agencies wouldn't fund it, because I first needed to prove that it was successful," Dr. Drouin-Ouellet told Mind Over Matter®.

> **EARLY-CAREER INVESTIGATORS DON'T ALWAYS HAVE THE MEANS TO GENERATE THE DATA THAT WE NEED TO GET FUNDING, SO IT'S A VICIOUS CYCLE.**

Hers is a common story. Now, Brain Canada, supported by an anchor gift from the Azrieli Foundation, is providing critical financial support to address the funding gap for Canada's young scientists. Through the Future Leaders in Canadian Brain Research Program, 20 Canadian neuroscientists will receive $100,000, with the aim to fund a similar number of researchers every year for a total of five years.

With this major boost to brain research in Canada, 100 early-career researchers could receive this invaluable funding and have the opportunity to explore new and innovative ideas.

Dr. Drouin-Ouellet is among the first cohort of the 2019 Azrieli Future Leaders in Canadian Brain Research and is poised to begin her work when pandemic restrictions lift. "It's made a huge difference," she said.

This essential program lies at the heart of Brain Canada's mission. "At Brain Canada, we play a unique and invaluable role as a national convenor of the brain research community, driving innovation and connectivity by building a truly interdisciplinary commitment to brain health," said Dr. Viviane Poupon, President and CEO of Brain Canada.

"The next generation of brain researchers has enormous potential, and we are proud to highlight this group of women here in Mind Over Matter®."

Funding for the program was provided by Health Canada, through the Canada Brain Research Fund, an innovative partnership between the Government of Canada (through Health Canada) and Brain Canada, together with the Azrieli Foundation.

"This grant competition is a transformative initiative at a time when there is a significant funding gap for our brightest early-career investigators," said Dr. Naomi Azrieli, Chair of Brain Canada's Board of Directors and CEO of the Azrieli Foundation.

> **THEY ARE AT A CRITICAL POINT IN THEIR CAREERS: POISED TO MAKE MAJOR CONTRIBUTIONS TO CANADIAN BRAIN RESEARCH, BUT IN NEED OF SEED FUNDING TO GAIN EXPERIENCE.**

DR. MASHA PRAGER-KHOUTORSKY

It is timely for the funding recipients. "In the beginning, we're all struggling to get our first grants and to start our own labs. It gives a bit of fresh air to push forward and to get new labs going," noted Dr. Masha Prager-Khoutorsky, an Assistant Professor in the Department of Physiology in McGill University's Faculty of Medicine.

She is studying brain cells in animal models, searching for answers as to what induces humans to eat the types of unhealthy diets that may lead to diabetes. The brain talks to the body, but in the case of type 2 diabetes, it sends the wrong message.

Dr. Prager-Khoutorsky is currently studying the responsible cellular structures in the brain - research that will contribute to a better understanding of the pathological changes in the brain that lead to diabetes. "If we can understand why it doesn't work, we can manipulate it, which in turn can lead to the development of treatment in humans," said Dr. Prager-Khoutorsky.

DR. CAROLINE MÉNARD

The search for better treatments is a common theme among the recipients of funding from the Future Leaders program. For Dr. Caroline Ménard, Assistant Professor at Université Laval, the focus of her research is depression. She is exploring something that all of us face in our daily lives: stress. More specifically, she is examining how stress affects the brains of mice (which have parallels with human brains).

"I hope we're going to identify new mechanisms that will lead to better treatments and to help prevent and diagnose depression," she said.

Dr. Ménard noted that Brain Canada's support not only helps pay for her research, but is also a welcome boost for morale. "It shows you that your science is good and credible. It's also very rewarding, I have to say, to get a win."


DR. JO ANNE STRATTON

"We're very grateful that there are initiatives like these for brain researchers," added fellow recipient Dr. Jo Anne Stratton. Dr. Stratton, Assistant Professor at the Montreal Neurological Institute, McGill University, is studying how inflammation molecules get into the brain, and how they contribute to brain dysfunction in diseases like multiple sclerosis. This exciting project could have wide-reaching applications in understanding memory loss in brain diseases affected by inflammation.

The Brain Canada funding is her first major research grant, coming at a crucial time.

> **IT'S REALLY HARD EARLY IN YOUR CAREER, ESPECIALLY WITH THE PANDEMIC, SETTING UP A NEW LAB. IT'S A GOOD COMPLIMENT DURING THESE CRITICAL FEW YEARS.**

The Future Leaders program is not only supporting new researchers, but also new ways of looking at research, an aspect that Dr. Sara Tremblay appreciates. "It's really huge because it's quite difficult to start and compete with researchers who have years of experience for grants. This is very rare and very helpful," said the Assistant Professor at Université du Québec en Outaouais.


DR. SARA TREMBLAY

Dr. Tremblay's project is looking at a treatment for depression called repetitive transcranial magnetic stimulation (rTMS), in which people who did not respond to other therapies undergo a non-invasive procedure that stimulates areas of the brain.

Her innovative technique involves using two forms of brain scans – positron emission tomography (PET) and magnetic resonance imaging (MRI) – to study individuals receiving rTMS in the hopes of predicting who will benefit most from this brain-boosting treatment.

"This point is very important because right now there is a lot of trial and error and we don't know who responds better," she said.

The list of neuroscientists receiving the Future Leaders grant includes individuals from a variety of different backgrounds, an important aspect for Brain Canada. "Evidence clearly shows that increasing equity, diversity, and inclusion in research environments enhances excellence and creativity," noted Dr. Poupon.

"Brain Canada is committed to excellence through equity, and we encourage applicants of diverse backgrounds to apply to all of our funding opportunities. We understand that if we really want to remove inequity, then we need to do a little bit extra. We must all come together and do more – Brain Canada is ready to do that."


DR. JEEHYE PARK

The neuroscientists profiled in this article are among a group of Future Leaders based in laboratories across Canada; women and men who have roots both in this country and around the world. Dr. Jeehye Park's science journey started in South Korea, where she received her PhD, followed by completing her postgraduate studies in Houston, Texas, to her current jobs as a scientist at the Hospital for Sick Children and an Assistant Professor at the University of Toronto.

"My dream was to be a professor and have my lab and make discoveries that could benefit the world," she told Mind Over Matter®. Supported by the Brain Canada funding, she is on her way, with a study related to Amyotrophic Lateral Sclerosis (ALS, also known as Lou Gehrig's disease or motor neuron disease).

ALS is a progressive, degenerative disease that destroys the nerve cells that control voluntary muscle movement. Dr. Park is trying to discover how immune cells might contribute to that process. She has ambitions for a large-scale project, but needed this grant to develop strong preliminary data.

"It's really important to get the seed funding for the research in order to get the bigger funding and so I think this award will be very useful," she said.

Brain Canada recognizes that the next generation of brain researchers has enormous potential, and they are embarking on their careers just as science and technology are unlocking the mysteries of the brain. Fortunately, this is only the beginning for Brain Canada's Future Leaders program. It is an important investment that aspires to give a boost to emerging neuroscientists when they need it the most.

The Future Leaders in Canadian Brain Research Program has been made possible with the financial support of Health Canada, through the Canada Brain Research Fund, an innovative partnership between the Government of Canada (through Health Canada) and Brain Canada, and the Azrieli Foundation.

MEET THE AZRIELI NEXT GENERATION FUTURE LEADERS IN CANADIAN BRAIN RESEARCH AND THEIR AREAS OF FOCUS

Boris Bernhardt
PhD, McGill University

Helping us see autism spectrum disorder like never before.

Mark Brandon
PhD, McGill University

Powerful new technologies to understand our most powerful memories.

Mark Steven Cembrowski
PhD, University of British Columbia

Big data science. Number crunching to wipe out epilepsy.

Allen W. Chan
PhD, University of Alberta

Understanding autism. Unifying our brain parts, programming, and personality.

Laurent Chatel-Chaix
PhD, INRS-Centre Armand-Frappier Santé Biotechnologie

Looking for the "Eureka" moment that will stop Zika.

Janelle Drouin-Ouellet
PhD, Université de Montréal

The innovative research technique that could make Parkinson's history.

Christian Ethier
PhD, Université Laval

Bio-circuitry that will boost the brain's ability to heal.

Marco Gallo
PhD, University of Calgary

Imagine finding a switch that turns off pediatric brain cancer once and for all.

Yasser Iturria Medina
PhD, Montreal Neurological Institute, McGill University

Your brain is as distinct as your fingerprint. Imagine personalized medicine that precise.

Robert Laprairie
PhD, University of Saskatchewan

Cannabis is legal, but we need better information on its impact.

Michael Mack
PhD, University of Toronto

Studying brains to help them study better.

Caroline Ménard
PhD, Université Laval /CERVO

Exploring the mind-gut connection to see how stress can promote inflammation and lead to depression.

Jeehye Park
PhD, SickKids Research Institute, University of Toronto

How does ALS work to make our neurons not work?

Aaron Phillips
PhD, University of Calgary

Meet the blood pressure pioneer of spinal cord injury.

Jean-Francois Poulin,
PhD, McGill University

It takes the best of human and computer brains to map the human brain.

Masha Prager-Khoutorsky
PhD, McGill University

Studying rat brains to better understand Type 2 diabetes.

Ravi Rungta
PhD, Université de Montréal

Powering our understanding of how the heart powers the brain.

Jo Anne Stratton
PhD, Montreal Neurological Institute; McGill University

This cellular detective is hunting down the MS molecule.

Sara Tremblay
PhD, University of Ottawa

The next wave in depression treatment is literally waves.

Ryan Yuen
PhD, SickKids Research Institute, University of Toronto

Genetic mutations causing autism are elusive, they hide in different areas of DNA in different people.

COLOUR MY WORLD

A CHILDHOOD HOBBY GAINS POPULARITY WITH STRESSED-OUT ADULTS

You may have noticed the influx of colouring books aimed at adults that are filling the shelves of your local bookstore, or the stream of colouring projects being shared across your social media feeds. Colouring is an activity that many of us might associate with childhood, but it is increasingly being marketed towards adults as well.

If it has been decades since you last sat down with a set of colouring pencils or crayons, you might want to consider giving this activity another try. Researchers have found that, in some instances, colouring can help to reduce anxiety in adults.

WHY ADULTS ARE COLOURING TO RELAX

Anxiety levels have been on the rise for decades, affecting four out of every 100 people (as reported in the June 2014 issue of *Depression and Anxiety*). As people try to cope with the global COVID-19 pandemic, we are seeing even higher levels of anxiety. This is particularly concerning because anxiety can lead to, or worsen, conditions such as trouble sleeping, headaches, digestive issues, and depression. →

According to a systematic review conducted by Dr. Olivia Remes and colleagues (published in the June 2016 issue of *Brain and Behavior*), women are twice as likely to have anxiety disorders than men. Studies suggest that this is due to a number of different factors, including brain chemistry, hormone fluctuations, and how women and men tend to deal with stress.

In a study published in the November 2017 issue of *Creativity Research Journal*, Dr. Jayde Flett and colleagues found that daily colouring amongst female adults can be an effective, inexpensive, and highly accessible tool in reducing the negative psychological outcomes related to anxiety and depression.

More recently, people are also turning to colouring as an easy and creative hobby that can be done under the stay-at-home restrictions imposed by provincial governments during the pandemic.

"While it's important to differentiate between the art therapy practiced with a credentialed therapist and colouring at home, art making by itself can have many benefits," noted Haley Toll, Editor in Chief of the *Canadian Art Therapy Association Journal*. "Making art and working with colours can be healing, as well as a way of practicing mindfulness."

Many of the benefits of colouring have to do with how it helps to re-focus the brain and provides an escape from what has been called our "inner chaos." Working with pencils and paper can be a welcome break from cell phone and computer screens for your eyes, and the low-stakes outcome allows for more creativity in a way many activities do not. For those who coloured as children, the nostalgic aspect can also be beneficial.

Toll further noted that the materials we use to create art can lead to different experiences. For example, colouring with pencil crayons provides you with a sense of control, which can be helpful for those who are stressed or have trouble letting go. By contrast, materials such as paint and watercolours (which may tend to release and spread much more quickly) create a sense of losing control.

WHAT YOU COLOUR MAKES A DIFFERENCE

Research dating back to the 1990s has demonstrated links between adult colouring and reduced anxiety, but studies have also shown that not all colouring has the same positive impacts.

Early research highlighted that colouring symmetrical figures with repeating patterns, such as mandalas, can have more of a calming effect than free-form colouring (Belchamber, 1997). More recent research has confirmed these results.

In a 2005 study of undergraduate students conducted by Nancy Curry and Dr. Tim Kasser, anxiety was induced in participants by getting them to think and write about a time when they felt fearful. Participants were then divided into three groups and were asked to colour a mandala pattern, a plaid pattern, or to free-form colour on a blank piece of paper, each for 20 minutes.

The researchers found that colouring a mandala design for 20 minutes was more effective in reducing anxiety than free-form colouring for the same amount of time. In fact, participants who did free-form colouring showed no reduction in their anxiety levels. The results of this study were published in 2005 in *Art Therapy: Journal of the American Art Therapy Association*. This study was replicated in 2012 by Dr. Renée van der Vennet and Susan Serice, who similarly found that colouring a mandala leads to greater reductions in anxiety than free-form colouring.

The researchers postulated that the mandala design provides both structure and direction (two elements that are not present with free-form colouring), which allowed individuals to enter into a meditative-like state.

Toll also pointed out that what you choose to colour can make a difference.

"Colouring something like a mandala provides structure and can remove the pressure to create," noted Toll. "Neuroscientists have also found that we have physical reactions to the images we see, so it's important to choose images that create positive experiences and reinforce your strengths."

So, if you are looking to escape the plethora of daily decisions and thoughts running through your head, look for an image of a structured mandala, or perhaps a scene that brings you joy, and start colouring! ◆

This issue of Mind Over Matter® contains four exclusively designed pages for you to colour, including a brain-shaped mandala. The center spread includes images of the six pillars of brain health:

1. **NUTRITION;**
2. **PHYSICAL EXERCISE;**
3. **MENTAL EXERCISE;**
4. **SLEEP;**
5. **STRESS REDUCTION; AND**
6. **SOCIAL ENGAGEMENT.**

Let us know if colouring helps you de-stress!
Send us a note at MOM@womensbrainhealth.org.

Illustrations: Yessi Nur Mulianawati | yessiow.com

BUSTING BARRIERS

UNIQUE RESEARCH FOR THE TRANSGENDER COMMUNITY

It is not uncommon for a researcher to show an interest in science at an early age. Growing up, Reubs Walsh was more precocious than most children her age. As a young child, she sought out books on the brain and neuroscience – literature that she now admits to barely understanding at the time. At the age of 14, the budding scientist even managed to land a short-term position working at Imperial College London's Tissue Bank, one of the world's leading repositories of donated brain tissue from individuals who had suffered from neurodegenerative diseases. ⟶

Reubs was driven by a strong personal motivation: the experience of watching her mother cope with multiple sclerosis.

“When she’d have a relapse, my way of dealing with the consequences was to try to take control by trying to understand it,” said Reubs.

Her studies brought her to the University of Oxford in the U.K., where she majored in physiology, and now to Vrije Universiteit Amsterdam in the Netherlands, where she is pursuing a PhD in Neuro-Developmental Psychology. Along the way, her focus evolved as she began a new chapter in her life. Reubs came out as trans and her research interests turned to the sex and gender aspects of the brain.

Then, in 2016, she met Dr. Gillian Einstein.

Dr. Einstein, who holds the Wilfred and Joyce Posluns Chair in Women's Brain Health and Aging at the University of Toronto, was participating in a conference held in Frankfurt, Germany. She was giving a speech entitled “Beyond the Binary: The Corporeal Lives of Trans Individuals.”

Dr. Einstein spoke about the complexity of gender identification, drawing upon her research involving trans men, a project suggested by a trans man who was an undergraduate student at the University of Toronto.

“When I saw Jill’s work at the conference in Frankfurt, I more or less said to myself that I needed to talk to this woman some more,” said Reubs in a video conference call with Dr. Einstein and Mind Over Matter®. “And, as I recall, I basically cornered [Dr. Einstein] and said ‘shall we go to dinner?’”

> **IT WAS A SERENDIPITOUS MEETING FOR DR. EINSTEIN BECAUSE SHE WAS SEARCHING FOR THE RIGHT PERSON TO TAKE ON A PROJECT TO EXPAND OUR KNOWLEDGE OF THE LONG-TERM BRAIN HEALTH OF TRANS INDIVIDUALS.**

Much of her research explores the impact of hormones on cognition of women as they age. Initially, the focus of her research was on cis women (i.e. those who identify as women and were assigned female at birth) until she received a visit from a trans woman.

“She said, ‘you are studying women, why aren’t you studying us?’”

People who come out as trans frequently undergo hormone therapy, but there has been little research conducted on the long-term implications of this treatment.

“We don’t really know anything about memory and aging in trans individuals,” said Dr. Einstein. “I started thinking that this is very much in line with Women’s Brain Heath Initiative (WBHI) and one of

their principal partners, Brain Canada, and it's very much in line with my own interests in terms of hormones shaping behaviour, and also really understanding the interplay between the social and the biological."

Undergraduate students had conducted some initial work, but she needed someone who could put in the long hours to take the research to the next level, including the challenge of recruiting individuals to participate in the study. Ideally, Dr. Einstein hoped to find someone from the trans community.

"The saying, 'nothing about us without us' is really important in this case," she said. "And then I had the great fortune of meeting Reubs."

After their Frankfurt meeting, the two collaborated on a paper and started talking about a new research project, which has now been approved for funding by WBHI and co-funded by The Citrine Foundation of Canada, and will be launched in the months to come, once pandemic restrictions lift and Reubs moves from Amsterdam to Toronto.

Their goal is to recruit at least 20 trans women who will undergo neuroimaging, cognition tests, and blood analysis. Ruebs believes that her personal experiences will help inform the study, notably the impact of stress. In her case, the wait for hormone treatments was long and trying, which added to the inherent societal stresses that trans people face.

"I would like to come away having at least more of an understanding of this interplay between neurodegenerative diseases and sex hormones, stress hormones, and sex factors related to hormones," said Reubs.

> **WHILE IT IS WELL KNOWN THAT CIS WOMEN DEVELOP ALZHEIMER'S DISEASE AT A MUCH HIGHER RATE THAN MEN, WE DO NOT YET KNOW IF THAT ALSO APPLIES TO TRANS WOMEN.**

"There just isn't enough knowledge to even really hypothesize what the long-term effects of gender-affirming hormone therapy might be," said Dr. Einstein.

"By definition, it's quite an exploratory project, because ordinarily there is a large existing bank of literature. But the unknowns are many. There is very little work in general looking at older trans people from a medical point of view," Reubs added.

She brings to the project an intimate understanding of the sensitivities of studying a group of individuals who have faced (and continue to face) many barriers. She will be consulting with community advisors on research methods – mindful of the potential risk of causing any further stress for those participating in the study.

There is also what Reubs refers to as a "delicate dance" for trans researchers who wish to study the impacts of hormone therapy. Having fought for so long to gain acceptance and access to treatment, concerns linger about how the results might be interpreted.

"I would like the opportunity to ask the question, 'what are the long-term effects of these treatments,' without someone saying 'yes, we shouldn't be doing them.' The long-term effects of eliminating these treatments are already known to be disastrous," said Reubs.

Dr. Einstein noted that all medications have both benefits and risks. Knowledge and informed consent are critical for patients. "It's the right of all groups to know something about the effects of treatments that they're taking," said Dr. Einstein.

The funding of this latest project is consistent with the ever-growing focus on diversity at WBHI.

"I'm very excited about this focus of WBHI. It's the right thing to do."

For Reubs, it is an opportunity to expand knowledge and understanding about the aging process for trans individuals. "If I can manage to do this important research, then I will be pulled up along with the rest of the trans community."

SHARING HER STORY

LISA RAITT'S CAREGIVING EXPERIENCE

Lisa Raitt
@lraitt

Here's what it's like when someone you love has Young Onset Alzheimer's [Language Warning]

Lisa Raitt is familiar with the spotlight. After more than a decade in Canadian federal politics, including stints in senior cabinet posts and a run for the Conservative Party leadership, she has endured intense media scrutiny, hardball debate with opponents, and demanding campaigns.

Although she was used to seeing herself on television and her name in print, nothing could prepare her for the moment in November of 2020 when she posted a video on social media.

The images were grainy, having been filmed in her bedroom in the middle of the night. Viewers observe a large man restlessly pacing back and forth, muttering gibberish interspersed with the odd understandable word and a few profanities.

The tweet read: "Here's what it's like when someone you love has Young Onset Alzheimer's [Language Warning]."

The man was her husband, Bruce Wood. Raitt had been periodically recording his outbursts for several months, documenting his deteriorating behaviour so that she could show family, friends, and professionals and seek their advice.

Now, she decided that it was time to show the world what life was like for someone dealing with Alzheimer's disease at an early age.

The video is painful to watch. Her husband is agitated, and Raitt was calmly trying to console him.

After a minute of pacing, he stood over her and demanded:

"Well...say something!"
"What can I do?" asked Raitt.
"I dunno. Get up and go!"

Another night's sleep was gone for her. One of many. Exhaustion was overtaken by the necessity of getting up and trying to placate a man whose personality had been subsumed by a devasting disease.

The posting went viral. Raitt has more than 65,000 followers on Twitter, including many in the news media and the political world. Instantly, there was an outpouring of support, sympathy, and respect. Raitt had already spoken publicly and emotionally about her husband's Alzheimer's, but the video had a visceral impact that words could not match.

Global News immediately contacted her, wanting to do a story. Others quickly followed. She was surprised at the response but accepted almost every request. "I have a platform and I can put it out there. And I did."

Raitt's political career ended (at least for the moment) when she was defeated in the 2019 election. A few months later, she had taken up a senior position with CIBC.

Now, life's events had brought her to a new cause: advocating for those with young-onset Alzheimer's and their caregivers. When she spoke to Mind Over Matter® earlier this year, she had already done countless interviews, always unsparingly honest about the challenges she faces. She noted with satisfaction that the coverage seemed to be sparking greater attention for the broader issues, citing a story on CTV's website that included several links to various articles on different aspects of dementia.

> “MAYBE ME BRINGING OUT SOME COLOUR, SOME CONTEXT, SOME REAL FAMILY STORIES ALLOWS OTHER TYPES OF STORIES TO BE TOLD THAT FIT TOGETHER A PICTURE OF CRISIS THAT WE'RE ALL GOING THROUGH. ESPECIALLY IN A TIME OF THE PANDEMIC.

Bruce Wood (like his wife) was a high achiever, the CEO of the Hamilton Port Authority. In 2016, after three years of increasingly erratic behaviour, his board advised him that he needed to consult a doctor. She accompanied him to the appointment, not knowing that they were going to speak with an Alzheimer's specialist.

Raitt was in another room while Wood underwent a cognitive test. The result was swift, clear, and heartbreaking.

"The doctor came in to see me and said 'we can't even finish the cognitive test because he's so upset and embarrassed, he's broken down. In fact, I don't even think I can tell him today that he has Alzheimer's because he's so emotional and distraught.'"

Raitt was initially in shock and denial. They quickly sought a second opinion, but there was no doubt that the initial diagnosis was correct. At the time, Wood was only in his mid-50s. He understood that his work life was over, but she says the disease had already progressed to the point where he could not grasp the consequences and future that he faced with Alzheimer's.

Raitt was no longer working in government and without ministerial responsibilities had more time on her hands. With Wood's support, she pursued her dream of running for the Conservative Party leadership. He was even able to make several fundraising phone calls on her behalf, but she recognizes now in retrospect that she was completely distracted during the entire campaign and she fell short of winning the top position. ⟶

In the years following Wood's diagnosis, the couple travelled as much as they could, including trips to Las Vegas and Italy, a cruise to Mexico, golfing in Florida, and a visit to her family in Cape Breton, Nova Scotia. From time to time, Wood would act up but overall Raitt says the experiences were worth it, no matter the expense.

> **WE CRAMMED IT ALL IN. I KNEW I HAD A SHORT PERIOD OF TIME TO ENJOY HIM. IT WAS LOVELY, AMAZING. THE LINE OF CREDIT AGAINST THE EQUITY OF MY HOUSE WAS WELL-USED.**

Wood remembers none of it now. "It was for us to experience in the moment. But it was for me to have the memory."

They had more travel plans in 2020 before the pandemic intervened. In lockdown, Wood's condition progressively worsened. She had to cover mirrors around the house because he was talking to them. She hired homecare workers to assist, but one quit, fearful of his angry outbursts.

Raitt would try to squeeze in some work around the middle of the day when the care worker was in the house and then continue working in the evening after her husband went to bed. At times he would interrupt business calls to demand to be taken for a drive, which would usually calm him.

In the fall, Wood stopped sleeping, which meant Raitt did not sleep either. That's when she posted her video on social media.

An undercurrent throughout was the threat of violence. The man formerly known as a "gentle giant" became increasingly aggressive and violent. One night, he punched Raitt. Over the Christmas holidays, another violent episode was stopped by her teenaged son. Wood also tried to kick his beloved dog. Then, on New Year's Day, everything came to a head. Wood began behaving erratically and appeared as if he was preparing to charge at her. Raitt ultimately called the police out of concern for her and her sons' safety.

At the time of her Mind Over Matter® interview, Wood was at the Behavioural Neurology Unit at Baycrest Hospital where doctors were attempting to stabilize him so that the violent episodes could be brought under control – a necessary step before he could be admitted to a long-term care facility. Raitt was uncertain as to whether he would ever be able to come back home again.

For Raitt, it was an opportunity for both respite and reflection. She was able to return to a proper sleep schedule and work normal hours. Although medical personnel told Raitt that she made the right decision in calling the police, she constantly second guesses herself.

"I was exhausted, burnt out from the previous six months. At the moment I didn't feel guilt, because there was violence. But now that I'm feeling better, there is guilt. I do miss him. He's the love of my life. But then I'm reminded that he is a different person now."

The experience has caused her to think more about her own brain health, never wanting to hear the diagnosis delivered to her husband. She found self-care to be challenging while trying to look after a loved one around the clock. Maintaining adequate sleep, exercising, and eating well are all exceedingly difficult when there is barely time to even go to the washroom.

Raitt says she benefited by joining a support group for caregivers, set up by the American-based organization Hilarity for Charity, which was founded by Canadian actor Seth Rogen and his wife Lauren Miller Rogen.

"I've found that those Thursday night calls that I've been doing since June have really been a lifesaver because I'm hearing other people's experiences, I know what's normal, what's not. I get great tips. But most importantly, I get grounded every single week, reminding me that this is the disease, it's not the man."

The former politician is now a different kind of public figure – an unexpected activist for individuals dealing with this particular form of dementia. By sharing her story, she is hoping to help decrease the stigma surrounding the disease and to raise awareness of the plight of family members and caregivers who witness their loved ones deteriorate.

Raitt has found that the majority of existing programs focus on older adults. She tried taking Wood to a dementia program, but he resisted when he saw that most of the participants were old enough to be his parents. "The reason I'm going to focus on young-onset Alzheimer's is because that's where I see the biggest gaps when it comes to quality of life and dignity of the person."

While Lisa Raitt is not sure yet exactly what form her advocacy will take, she says there is certainly a place for a Canadian version of Hilarity for Charity and its support groups for caregivers.

"The stories that I told and that I tell happen every single day to thousands of families, but nobody tells anybody outside this terrible club that this is what really goes on. And I believe people really need to understand."

ADVANCE NOTICE

EARLY DETECTION OF DEMENTIA

Since Alzheimer's disease (AD) develops over decades and is such a devastating illness when symptoms emerge, it is important to discover ways to detect the disease early (i.e. long before symptoms are evident), and to identify individuals who are at high risk of developing the disease in the future. ⟶

Early diagnosis could help improve the effectiveness of currently available treatments by allowing individuals to begin treatment before irreversible damage has occurred in the brain and providing diagnosed individuals (and their families) with more time to prepare for the future.

> **EARLY IDENTIFICATION OF HIGH-RISK INDIVIDUALS MIGHT IMPROVE THE SUCCESS OF RESEARCH INTO NEW, MORE EFFECTIVE TREATMENTS.**

AD is well-known for its effects on the brain and cognitive function, so it is not surprising that mental status tests are commonly used as a screening tool to identify individuals who should be further evaluated (additional tests are required for diagnosis since cognitive function can decline for a variety of reasons, not just AD). These tests evaluate memory and everyday thinking skills.

The Mini-Mental State Exam (MMSE) and the Mini-Cog Test are two of the commonly used mental status assessments. The Mini-Cog Test, in particular, is a simple test involving two tasks: (1) trying to remember and repeat a few minutes later the names of three common objects; and (2) drawing the face of a clock showing all 12 numbers in the correct places and the clock hands positioned at a specified time.

These types of assessments are an important part of the AD diagnosis process but are not used for early diagnosis or risk-identification because they look for impaired cognitive function, a symptom that does not become evident until later in the disease process.

So, what tools are currently being used or developed to help with early diagnosis or risk assessment? Since AD has negative impacts on a wide variety of body parts and functions, not just the brain, there are actually several different tests being investigated that might prove useful. In this article, we examine some of the latest research into three interesting types of tests that are showing promise: motor function tests, eye examintations, and smell tests.

In the **Timed Up and Go (TUG) Test**, individuals begin in a seated position and are timed while they rise to standing, walk three metres, turn around and walk back to the chair, and sit down again. It is a simple test used to assess mobility.

MOTOR FUNCTION TESTS

As an individual's cognitive function declines, so does her or his motor function; the two are interrelated, with motor dysfunction clearly increasing during the moderate and severe stages of dementia. But what happens to motor function during the early stages of dementia?

Brazilian researchers considered that question in a 2019 systematic review and meta-analysis. (A meta-analysis combines the data from multiple studies.) Specifically, they looked at 18 studies that used the Timed Up and Go (TUG) Test among older adults with mild cognitive impairment (MCI) or AD, compared with healthy older adults.

The meta-analysis revealed that the raw mean difference in time between those with MCI and the healthy older adults was approximately one second, meaning that people with MCI were showing a small decline in mobility compared with the healthy control group.

When the healthy older adult group was compared with those who had mild AD, mild-moderate AD, and moderate-severe AD, the raw mean difference in time was 2.43 seconds, 3.01 seconds, and 4.51 seconds, respectively. Notice the pattern there – the average length of time to perform the TUG Test grew longer as the cognitive impairment got more severe.

"These results indicate that there is indeed a difference in functional mobility across these groups, with gradual decline in mobility happening as Alzheimer's disease progresses," said Dr. Andrea Camaz Deslandes, an Associate Professor at Universidade Federal do Rio de Janeiro and one of the authors of the study.

> “
> **THE TIMED UP AND GO TEST COULD BE SUITABLE FOR ASSISTING IN IDENTIFYING DEMENTIA IN ITS VARIOUS STAGES, INCLUDING THE EARLIER ONES.**

These findings were published in August 2019 in *Archives of Gerontology and Geriatrics*.

EYE EXAMINATIONS

The eyes also provide important clues about brain health that may assist with early diagnosis or prognosis of AD (i.e. identifying if a

The **retina** is comprised of ten distinct neural layers at the back of the eyeball that sense light and trigger impulses that travel via the optic nerve to the brain.

person has asymptomatic AD or is at high risk of developing AD in the future). The retina has been of particular interest to researchers because it is part of our nervous system, containing the same kinds of cells, blood supply, and chemistry as the brain.

The retina is really an extension of the brain, located in a part of the body that is much more accessible to examine than the brain itself. That means it can be examined in microscopic detail in a way that is non-invasive, completely painless, and much less expensive than a brain scan.

MANY LINKS HAVE BEEN FOUND BETWEEN AD-INDUCED CHANGES IN THE BRAIN AND CHANGES IN THE RETINA.

For example, amyloid-beta plaques and hyperphosphorylated tau (pTau) protein have been found in the retinal tissues of individuals with AD (and in their brains). Changes in retinal thickness and texture, as well as retinal blood flow, have also been found. Findings like these generated interest in the scientific community about whether retinal imaging could be used to screen for AD biomarkers (i.e. measurable indicators of the presence or severity of AD) early in the disease process.

Dr. Peter Snyder and his colleagues in the U.S. are among the researchers studying the potential AD-related clues that might lie in the retina. In early 2020, they began recruiting participants for the Atlas of Retinal Imaging in Alzheimer's Study (ARIAS). This study will involve 330 participants who will be examined four times over the five-year study period, undergoing a variety of examinations, including neuropsychological testing, blood testing, genetic testing, medical/functional assessment, gait assessment, and sleep analysis - all in addition to special retinal scans that take pictures with blue, green, and infrared lasers.

The researchers will be looking for patterns in all that data, and specifically for clues regarding what changes in the retina are linked with other common indicators of AD. Ideally, they will be able to narrow down the range of retinal metrics to just a few key indicators that can be combined into a single test.

"Our goal in this study is to create a 'gold standard' reference database of various features found in retinal imaging to help identify sensitive and reliable markers of early Alzheimer's disease and/or risk of developing the disease," said Dr. Snyder, Vice-President for Research and Economic Development and Professor at the University of Rhode Island.

"We hope our findings will help in the development of a screening tool that could be used by optometrists and ophthalmologists to identify patients who should be referred to a specialist for further diagnostic and confirmatory tests. In other words, retinal scans are not likely to work as a tool on their own to diagnose Alzheimer's disease at any stage, but they could help with early identification of people who should get different kinds of additional testing because they appear to be showing some signs of high risk."

SMELL TESTS

The sense of smell is another promising avenue of research for early detection of AD. There is a close connection between our sense of smell and the functioning of certain parts of the brain.

> **A CHANGE IN THE SENSE OF SMELL IS ONE OF THE FIRST SYMPTOMS TO APPEAR WHEN AN INDIVIDUAL IS DEVELOPING AD, BEFORE COGNITIVE DECLINE IS NOTICEABLE.**

Olfactory dysfunction is experienced with increasing prevalence as a part of normal aging, though, so researchers are working to determine how to accurately tell the difference between normal age-related reductions in olfactory function and disease-induced dysfunction.

There are several ways one's sense of smell can be tested. Two examples are odor threshold and odor identification. Odor threshold refers to the lowest concentration of an odorant that can be detected reliably. Research has shown that odor threshold sensitivity is strongly affected in AD, and that the degree of smell impairment is linked with the severity of AD. Odor identification refers to whether a person can identify and correctly "label" a common smell. It, too, has been found to be strongly affected in individuals with AD, as well as in those at high risk.

Although it takes more time to administer more than one type of test, doing so can help improve the accuracy of the results. This seems to be the case with odor threshold and odor identification testing; combining the two tests has been found to increase the accuracy of classifying study participants correctly as either healthy control subjects, or individuals with AD or MCI (compared to using the odor identification test alone).

There are many versions of smell tests, even when testing just one of the smell "domains." Odor identification, for example, is →

sometimes tested using booklets containing varied numbers of "scratch-and-sniff" pads of odor, with a multiple-choice list of potential answers for each. It is also tested with odors being presented using felt-tipped, pen-like dispensers, as is the case with one smell test used quite extensively in research known as the Sniffin' Sticks Test.

The Sniffin' Sticks Test was used in a recent study conducted by Dr. Ding Ding and colleagues to investigate the predictive value of odor identification testing for dementia among elderly participants who were part of the Shanghai Aging Study (i.e. to evaluate if impairment in identifying odors, perhaps specific ones, could indicate a likelihood that someone will go on to develop dementia).

In that study, 947 participants underwent extensive testing of various risk factors associated with dementia at baseline and again at follow-up an average of 4.9 years later.

> **OLFACTORY FUNCTION WAS JUST ONE OF THE DEMENTIA RISK FACTORS THE RESEARCHERS EXAMINED (THEY ALSO CONSIDERED VARIABLES SUCH AS GENETICS, DEMOGRAPHICS, AND LIFESTYLE).**

The researchers used a version of the Sniffin' Sticks Test that consisted of 12 odors: orange, leather, cinnamon, peppermint, banana, lemon, licorice, coffee, cloves, pineapple, rose, and fish. After conducting complex analyses of the data collected, the researchers discovered that one odor in particular stood out for its potential predictive value.

They found that the ability to smell peppermint was the third most important variable in their prediction models, after only MMSE score and age. The MMSE on its own showed usefulness for predicting dementia in the study, but the addition of peppermint detection to the model further improved precision and accuracy. These findings were published in August 2020 in *Frontiers in Aging Neuroscience*.

More research is needed to understand exactly what types of tests will be most effective at early detection of AD or accurate prediction of high risk – whether that is a tests of motor function, eyesight, smell, or something else entirely.

The search continues for a single test (or combination of tests) that will ideally be quick, non-invasive, and low cost. This article provided just a small glimpse into the discoveries to date, but with the wide range of tests continuing to be investigated, there is sure to be many more exciting developments in the years to come.

PUT YOUR MIND TO REST

SENSORY AIDS FOR DEMENTIA ANXIETY RELIEF

Restless hands, anxiety, and agitation are common symptoms of those living with Alzheimer's disease and other types of dementia. As the disease progresses, individuals' hands become increasingly nervous and fidgety, as they continually search for something to occupy them. Signs of anxiety or agitation include rubbing hands together, twisting fingers, pulling at clothing or bedding, and generally keeping hands in motion. ⟶

A FEW THINGS TO KEEP IN MIND

ASSESS

Assess the needs of the individual. Ensure that the patient will be able to complete the tasks rather than become frustrated and even more agitated.

QUALIFY & QUALITY

Qualify any purchase or design with any potential "rules" of the care facility, if the patient is in one. For example, in some facilities, buttons may not be allowed. You will also want to confirm how, when, and how often the fidget item is cleaned by the facility. This is particularly important if the mat ends up being shared among a group of friends. If the item is being cleaned by a care facility, you will want to use quality materials that are well secured and can withstand heated drying.

RESPECT

Be sensitive and respectful. Effort should be made to preserve the dignity of the patient. For example, avoid obtaining young or juvenile-themed mats.

SIMPLIFY

Research indicates that individuals with advanced neurodegenerative diseases frequently have narrowed peripheral vision, sometimes referred to as "binocular vision." This means that in severe cases of dementia, an individual's visual field can reduce to just 12 inches around (which feels like she or he is wearing binoculars). As a result, some experts encourage fidgets to be small and manageable. Creating larger fidget items may be futile if an individual's field of vision is vastly narrowed.

GO BOLD

Because changes to one's visual field are common among those with Alzheimer's disease or dementia, they are likely less sensitive to differences in contrast. Using bold colours such as reds, oranges, and yellows can be helpful.

Trying to reduce anxiety can be both challenging and overwhelming for family members and caregivers. A safe and creative solution that helps to keep hands busy (and smiles on faces) can be found through the introduction of tactile therapy, such as that provided with a "fidget" object. Simple, repetitive movements and sensory stimulation are effective ways to help calm nerves and provide comfort. Fidget objects allow individuals with dementia to keep their hands engaged in safe, soothing ways so that they can focus on what is going on around them.

A 2020 study conducted by researchers at the UC Santa Cruz and the UC Davis MIND Institute on the effectiveness of fidget objects provides strong anecdotal evidence that there is a positive association between these objects and the impact they have on brain function, when used with intentionality. Fidget objects are great supportive resources for dementia and Alzheimer's patients, as well as those experiencing autism and neurological disabilities or special needs.

Fidget objects come in many different shapes and forms, including aprons, quilts, mittens, pillows, mats, or blankets, and even boxes or boards. They are commonly referred to as fidget, sensory, or activity mats or lap quilts, because they are meant to sit on your lap as a stable stimulating activity. Common materials for fidget objects include fabrics, trims, and ribbons, all with different textures. The addition of features such as buttons, beads, pom poms, fur, zippers, and Velcro heighten the experience. The different textures of fabric enhance the sense of touch and encourage hand dexterity. Adding a ribbon on a zipper, for example, makes it easier to grip for shaky hands and provides a varied textured experience.

Working with a fidget object not only supports muscle strength and hand control, but also can be a source of entertainment and serve as an opportunity for interactivity with a healthcare worker or visitor if it is personalized. Customizing a fidget object such as a quilt or board with materials and items from a person's past can spark conversation and memories (e.g. including a piece of a quilt made for a grandchild or other fabrics that hold cherished memories, as well as incorporating favourite colours).

Many of the materials such as zippers, buttons, pockets, belts, and laces, and motions mimic common dressing skills that can help increase independence. As a result, this kind of personalized and high-functioning object can help improve communications, as well as help reinforce memory and lifestyle skills.

A recent study published in the May 2018 issue of *Clinical Interventions in Aging* found that sensory and memory stimulation therapies have the potential to help improve many dementia-specific issues for individuals living in long-term care settings. As the researchers noted, long-term care facilities are often faced with managing multiple residents who exhibit challenging behaviours due to the progressive deterioration of brain cells that cause dementia. Additionally, residents tend to get frustrated while trying to articulate their needs and/or concerns to their caregivers, which can often lead to agitated behaviours.

The first instinct in these situations is often to seek medication as a means to offset these behaviours. However, prescribing too many medications can create additional issues such as falls, strokes, or death. Using non-pharmacological means such as sensory and memory stimulation can promote both physical and emotional comfort to the residents.

Overall, by comforting patients and reducing frustration, the preoccupation of fidget objects can even lessen the potential for other anxious and distressing behaviours. Fidget objects provide a quick and easy way to engage hands and minds for simple stimulation. This can be particularly helpful while waiting for appointments or engaging in other passive activities. Not only does this help the patients themselves, but it also helps their caregivers, and even offers some downtime or reprieve from difficult times of the day or when patients are experiencing a heightened sense of boredom and/or are uncomfortable in their surrounding environment.

OVERALL BENEFITS OF FIDGET OBJECTS:

- REDUCES AGITATION AND ANXIETY
- PROVIDES MENTAL STIMULATION
- REINFORCES MEMORY AND LIFESTYLE SKILLS
- IMPROVES HAND DEXTERITY
- HELPS CALM AND COMFORT
- SPARKS CONVERSATION AND ENCOURAGES INTERACTIVITY
- OFFERS A NON-PHARMACOLOGICAL ALTERATIVE FOR OFFSETTING AGITATED BEHAVIOUR

Fidget mat photos courtesy of the 2 Fidgeteers of Nova Scotia Canada

THINKING AHEAD

DEMENTIA CARE PLANNING

If you have been diagnosed with dementia, then a lot will change about your life in the years to come as your ability to think and make decisions decline. It is therefore critical to take time soon after your diagnosis to plan for the future. Most people diagnosed with dementia address legal and financial matters, for example, by having a will and power of attorney drawn up, but a less common area that is equally as wise to make plans for is your future care.

> **TAKING THE TIME TO THINK ABOUT, DISCUSS, AND DOCUMENT YOUR WISHES ABOUT YOUR FUTURE CARE CAN HELP MAKE THE ROAD AHEAD A BIT EASIER FOR YOU, AS WELL AS FOR YOUR CAREGIVERS.**

It is important to learn about the various stages of dementia, think about the help you will need along the way, and consider how you want to be cared for, including during the later stage of the disease when you will no longer be able to make decisions and communicate your wishes.

PLANNING A CARE TEAM TO SUPPORT YOU THROUGH ALL THE STAGES

Most older adults prefer to stay in their own homes for as long as possible, and this is true for those with dementia as well. In order to live at home as your dementia progresses, an ever-increasing amount of support will be required to ensure that you are safe and that your needs are met.

Some of that support may come from paid caregivers, or perhaps provided as part of your country's healthcare system or through insurance or benefits coverage you have, or may be paid for directly by you or your loved ones. It is likely that much of the support you receive will come from unpaid caregivers (i.e. your family and friends).

This type of informal care could evolve organically over time, with loved ones responding to your needs as they become evident.

A **will** is a legal document that provides instructions regarding how you want your property and assets to be distributed after death.

A **power of attorney (POA) for property** is a legal document that gives a designated person (or persons) authority to manage your finances and/or property on your behalf. Despite the word "attorney" in the document title, the designated person(s) can be anyone, and does not need to be a lawyer. There are two types of power of attorney for property:

- non-continuing or general, which is time-limited and is automatically revoked if you become mentally incapacitated; and
- continuing or enduring, which applies if you become physically or mentally incapacitated and are unable to act on your own behalf.

There is another type of **power of attorney, for personal care**, which is discussed in more detail in this article (in the context of choosing a substitute decision-maker for healthcare).

Although a power of attorney can be drafted without professional assistance, it is always a good idea to seek legal advice and services from a lawyer who specializes in this area of law if you have any questions or concerns.

WITH SOME ADVANCE PLANNING TO "SHARE THE CARE," INFORMAL CAREGIVING HAS THE POTENTIAL TO BE MUCH MORE EFFECTIVE AND LESS OF A BURDEN TO ALL INVOLVED.

Often, one person assumes the lead caregiving role for a person with dementia and may sometimes try to shoulder the responsibility alone. But this is a significant amount of work for a caregiver to handle independently without feeling overwhelmed and eventually burning out. To help prevent this from happening to your primary caregiver, you could spearhead the creation of an organized care team - a group of individuals you can rely on to provide help, support, and connection through all stages of dementia.

To form a care team, you will want to consider the following:

1. WHAT DO YOU NEED HELP WITH?

Think about what you need from others, now and in the future. Consider both your physical and emotional needs. For example, you will not only need help with tasks such as laundry and cleaning, but you will also need support to remain mentally and socially engaged.

Do not think that it is frivolous to ask for people to call just to chat, or to join you for walks or lunch, or to come over and play cards - these types of activities are important for your quality of life and for helping to keep your brain healthy longer. Keep in mind that the list of things you require help with will change over time as your needs shift and therefore will be revisited regularly.

2. WHO WILL BE PART OF YOUR CARE TEAM?

Brainstorm who might be willing to be part of your volunteer care team - for example, family members, friends, neighbours, members of your church or social groups, and/or current or former coworkers - and reach out to those individuals to explain that you are organizing a care team and to ask if they are willing to be involved. Emphasize that even a small amount of help occasionally would be appreciated, and that a care team is based on the premise of "many hands make light work."

If they are interested in helping, inquire about their strengths, availability, and preferences. Cast a wide net and reach out to people even if they do not live nearby. There are often tasks that can be performed remotely, so one's location should not limit who you will invite to be part of your team. →

3. WHO WILL DO WHAT?

Review the list of what you need help with and who is willing to provide help, and then look for any obvious pairings. Your care team members may help you with tasks themselves or, in some cases, they may research and organize help from outside of the team (e.g. home-delivered meals and transportation).

Some individuals will help with large and/or recurring activities, while others will help with small, one-off tasks, but when combined, their collective efforts will ideally cover all of what you need. If not, revisit step two on the previous page, and consider inviting additional people to the team. Be sure to find someone who is willing to take the lead with ongoing coordination of the care team; that is a role essential to the success of this approach and requires a person with strong organizational and communication skills.

4. HOW WILL TEAM MEMBERS COMMUNICATE AND COORDINATE WITH ONE ANOTHER?

Task assignments can happen in conference calls, emails, in-person meetings, or through technological platforms designed for group collaboration. Choose whatever communication tool will work best for your team and decide on a schedule for engaging in regular communication and reviewing planned tasks. (Do not feel like this can only work if everyone is technologically savvy. People have organized successful care teams using just pen and paper, and the telephone.)

It may feel uncomfortable to ask for and accept help from others, but often people really want to assist and feel great when they do, particularly if the help they provide is aligned with their strengths and in an amount that is reasonable given their availability.

BY ASKING FOR HELP DIRECTLY AND PROVIDING SOME CONCRETE GUIDANCE ABOUT WHAT YOU NEED, YOU ARE DOING YOUR LOVED ONES A FAVOUR.

They get to satisfy their desire to help in a way that they know with confidence is useful and appreciated, rather than trying to guess your needs or sitting idly by wanting to help but not knowing what to do.

CHOOSING A SUBSTITUTE DECISION-MAKER FOR HEALTHCARE

There will come a time when the dementia advances to a stage where you are no longer able to make your own decisions. When that happens, you will probably want a person of your choosing to be in charge of making decisions about your healthcare (rather than someone designated automatically according to standard laws for your area).

This person will be your "substitute decision-maker" specifically for healthcare-related matters and need not be the same person you designate to handle your financial and/or legal matters. You should make this designation official with a legal document. Such a document may have different names, depending on where you live (e.g. power of attorney for personal care, or personal or health directive).

It is not enough to simply designate a substitute decision-maker for future healthcare, though. You also need to ensure that person is informed about your preferences and wishes.

> **DO NOT ASSUME THAT YOUR SUBSTITUTE DECISION-MAKER KNOWS YOU WELL ENOUGH AND WILL BE ABLE TO GUESS WHAT YOU WANT.**

RESOURCES FOR CARE TEAM PLANNING

- Share The Care™ (STC) is a model for group caregiving that has been used with success around the world. It provides a step-by-step plan to help individuals pool their time, efforts, and resources to help a friend or loved one who is facing a health, aging, or medical crisis – including dementia. Using the STC model has been shown to help caregivers feel a decreased sense of burden, support a care receiver's ability to live at home, and improve the overall well-being of all involved. Caregivers and care receivers who have participated in a Share The Care™ "caregiving family" have reported experiencing solace, support, and even joy during difficult circumstances. Details about the model can be found in a book entitled *Share the Care: How to Organize a Group to Care for Someone Who is Seriously Ill* and on the organization's website (www.sharethecare.org).
- You might also want to check out some of the technological tools that have been designed specifically to help with communication and coordination among caregivers, including CaringBridge, ianacare, Lotsa Helping Hands

Instead, have frank, in-depth conversations about the kind of care that you wish to receive as you progress through the various stages of dementia. Two topics that you will want to cover in particular are: (1) plans for moving to a dementia-care facility; and (2) plans for end-of-life care.

PLANNING FOR A MOVE TO A DEMENTIA-CARE FACILITY

Many people with dementia end up needing to live in a care facility in the late stage of the disease. You may want to be involved in researching the available facilities and providing direction to your caregivers about your preferences. This is your opportunity to provide input about your priorities and, in particular, how you would like your money to be spent (or not spent).

Do you want to prioritize the best care possible in the nicest facility, regardless of cost? Or would you prefer a more modest choice that costs less or is perhaps funded (in full or in part) by the government or your health insurance? Do not assume that your substitute decision-maker will know what you would prefer.

Because you will not know in advance when you might need to move to a care facility, and many have lengthy waiting lists, it would be wise to choose a few options that you like rather than just one, and let your caregiver know that you understand that she or he may not be able to get you into one of your preferred locations.

However, if you have explained in broad terms to your substitute decision-maker what you like and do not like in a care home, then she or he will still be able to keep that in mind when selecting from the available options on your behalf.

PLANNING FOR END-OF-LIFE CARE

Toward the end of life, many people with dementia experience emergency hospital admissions and may be given aggressive medical treatments, even though the interventions often have poor outcomes. For example, a feeding tube might be used when someone is having trouble eating or swallowing (which is common in late-stage Alzheimer’s disease), but tube feeding has not been shown to benefit or extend life and can cause discomfort and infections.

Some people with dementia might value and appreciate being given all possible treatments to extend their life as long as possible, while others might prefer to prioritize comfort and quality of life. Unless you consider and share your wishes about end-of-life care, those caring for you will have to guess your personal preferences. These can be very stressful decisions for your loved ones to make on your behalf.

Deciding on whether to request treatment or withhold treatment for someone else is incredibly difficult, and a substitute decision-maker may not end up guessing your wishes correctly. In fact, one study conducted by Dr. Karen Harrison Dening and colleagues – published in July 2016 in *PLoS One* – found that when asked to choose a treatment option for various hypothetical end-of-life scenarios, there was low to moderate agreement between the choices made by the participants with dementia compared to their caregivers’ choices.

> **RESEARCH SUGGESTS THAT SUBSTITUTE DECISION-MAKERS OFTEN CANNOT ACCURATELY PREDICT THEIR LOVED ONE’S PREFERENCES FOR END-OF-LIFE CARE IF THEY HAVE NOT HAD A CONVERSATION ABOUT IT.**

You can help control the ways in which you are cared for as you approach the end of life by creating a living will or advance directive (a written document that records your wishes about future medical care, including preferences about treatments you do or do not want to be used in various circumstances).

There are many online resources and tools that can help you with discussing and documenting your wishes for end-of-life care, including:

- Speak Up Canada (www.advancecareplanning.ca), a Canadian organization that provides province-specific resources; and
- The Conversation Project, an initiative of a U.S.-based not-for-profit organization, the Institute for Healthcare Improvement. On their website (www.theconversationproject.org), they offer free resources to guide conversations about end-of-life wishes, including a guide targeted specifically to caregivers of those with Alzheimer’s disease or other forms of dementia (https://theconversationproject.org/wp-content/uploads/2020/12/DementiaGuide.pdf).

WHEN IS THE BEST TIME TO PLAN FOR FUTURE DEMENTIA CARE?

Although dementia typically develops over quite a long period of time, symptoms and rate of progression differ from person to person. This variability makes it difficult to predict when a person with dementia will no longer be capable of making her or his own decisions. So, it is wise to think about plans for your future sooner rather than later, in order to ease the burden on your loved ones and to ensure that your wishes are clearly understood before it is too late to share your opinions.

Research suggests, however, that it is typically not a good time for these discussions to occur immediately after a dementia diagnosis, as it can take some time to process and accept the life-altering news. Nevertheless, since dementia follows an unpredictable path, you should start thinking about plans for your future care as soon as you feel ready after receiving your diagnosis. →

ADVANCE PLANNING FOR DEMENTIA CARE IS CHALLENGING, BUT IMPORTANT

Although it may be both uncomfortable and upsetting to discuss and plan for the changes that lie ahead, there are countless benefits if you do so. Thinking ahead about your care will provide time for research about available supports and resources, as well as ensure that you and your caregivers are on the same page.

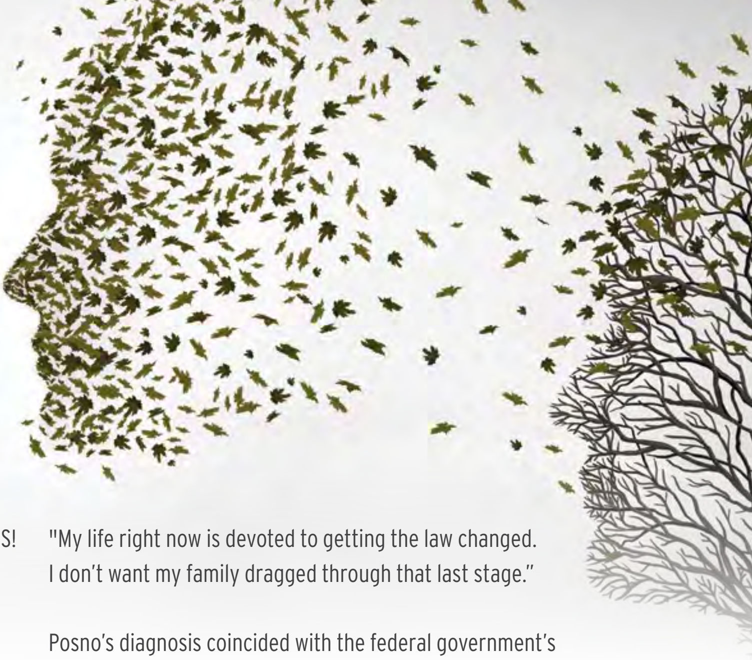
You will be more likely to receive better care, in line with your wishes, while your loved ones will be less stressed and anxious when making difficult decisions on your behalf. Face any discomfort you feel head on, and give you and your loved ones the peace of mind that comes from planning ahead for dementia care.

THE ROLE OF FAMILY & FRIENDS IN DEMENTIA CARE PLANNING

If you are a family member or friend involved in caregiving for someone with dementia, you may end up playing a critical role in the development of future care plans. You may need to be the one who initiates the conversation about future care. You may ultimately take the lead on organizing and maintaining a caregiving team. Your loved one with dementia may be reluctant to be the one who starts a discussion about this topic, but may be relieved if you bring it up.

LIVE & LET DIE

MEDICAL ASSISTANCE IN DYING



The email from Ron Posno was concise and passionate: "Angry…YES! Disappointed…VERY!"

Posno was responding to a question from Mind Over Matter® regarding the federal government's latest efforts to amend Canada's laws governing medical assistance in dying (MAiD). The House of Commons had just rejected the Senate's amendment to Bill C-7, *An Act to amend the Criminal Code (medical assistance in dying)*, which would have allowed individuals with dementia or other cognitive-impairing conditions to make advance requests for an assisted death.

The amendment to Bill C-7 was intensely personal for Posno. Five years ago, the retired special-education teacher from London, Ontario was diagnosed with mild cognitive impairment (MCI) – a common precursor to Alzheimer's disease and other forms of dementia. He describes his short-term memory as "gone" and notes that he is unable to remember what he had for dinner the previous night. When you speak with him, though, his diagnosis is indiscernible. His attitude is positive, and words come easily and energetically – evidence of his years as a motivational speaker.

"I'm not worried about it. I anticipated these things can happen. My life is a plan, I plan for things," he said. Posno's propensity for looking ahead led to his love of maps, which guided him and his wife Sandy through many years of travel, including far-flung airborne journeys after he obtained his pilot's license. Now, at the age of 80, Posno would like to plan for his final departure while he is still capable of making decisions about his future.

> **HE WORRIES THAT BY THE TIME HIS SUFFERING BECOMES INTOLERABLE (ONE OF THE REQUIREMENTS TO BE ELIGIBLE FOR MAID), HE WILL NO LONGER HAVE THE CAPACITY TO GIVE HIS INFORMED CONSENT TO THE PROCEDURE, WHICH IS ALSO NECESSARY BY LAW.**

He is particularly concerned about the financial and emotional burden on his wife, who will have to witness his inevitable decline. Restrictions on assisted dying in Canada turned him into an activist – writing blogs, giving interviews, and lobbying decision makers. "My life right now is devoted to getting the law changed. I don't want my family dragged through that last stage."

Posno's diagnosis coincided with the federal government's passage of legislation in 2016 that legalized two types of MAiD:

- The direct administration of medications or substances by a healthcare provider to end the life of a person at her or his request; and
- The self-administration of medications or substances by a person to end her or his life, prescribed by a healthcare provider at the person's request.

The legislation was first introduced in response to the Supreme Court of Canada's 2015 decision in the case of *Carter v. Canada (Attorney General)*, in which the Court held that provisions of the Criminal Code that prohibited assistance in terminating life were unconstitutional, as they infringed upon the rights to life, liberty, and security of the person for individuals who want access to an assisted death.

However, the conditions for accessing MAiD were stringent. According to the legislation, one's death had to be "reasonably foreseeable" and consent must be given by an individual with decision-making capacity – a nearly impossible requirement for those in advanced stages of dementia.

→

Medical assistance in dying (MAiD) is a medical procedure that involves the administration of medications to intentionally and safely end the life of a person who meets strict legal criteria, at the person's request.

MAiD is a complex and deeply personal issue. To learn more about MAiD, please contact your healthcare provider or visit Health Canada's MAiD webpage at https://www.canada.ca/en/health-canada/services/medical-assistance-dying.html.

Posno advocates for a model that would permit individuals diagnosed with dementia to take preemptive action (while they still have their faculties) and make an advance request for MAiD, before they lose the capacity to make a decision when the disease progresses.

He found an ally in Senator Pamela Wallin. She had attempted to insert an advanced request provision for those with dementia in the 2016 version of the legislation, only to see it rejected by the federal government.

> **“THE BILL SAID YOU CAN’T ASK FOR MAID BEFORE YOU’RE DIAGNOSED, AND ONCE YOU’RE DIAGNOSED YOU CAN’T ASK FOR IT BECAUSE YOU’RE COGNITIVELY IMPAIRED. IT BECAME THE ULTIMATE CATCH-22.**

When Parliament was required to revisit the controversial MAiD legislation in the aftermath of the Superior Court of Quebec’s 2019 decision in *Truchon v. Attorney General of Canada* (where the “reasonable foreseeability of natural death” eligibility criterion was found to be unconstitutional), Senator Wallin once again attempted to insert an advanced request provision into the legislation. Although her efforts to amend Bill C-7 were successful at the Senate level, the revised legislation was ultimately rejected when it went back to the House of Commons.

“This is unfair, inconsistent, and discriminatory against this one group,” Senator Wallin told Mind Over Matter®, citing an IPSOS poll from 2020 that found 82% of Canadians surveyed support the idea of an advanced request for MAiD for those with dementia.

“It means that the government believes that we do not actually know what is in our own best interest and that we cannot be allowed to make choices about our own futures. It’s an insult to anyone who has lived with autonomy and dignity to be denied the same choice at the end of life.”

Senator Wallin’s motivations were also personal. Before the death of her parents about seven years ago, she and her sister had frank conversations with them around the dinner table about end-of-life care. “Both of them said in very plain terms they didn’t want to live if they were physically or cognitively impaired,” recalled Senator Wallin.

Her father ultimately passed away from cancer, and if his last days had come after the passage of Bill C-7, he would have been eligible for physician-assisted death. By contrast, her mother – who passed away from Alzheimer’s disease – would not have had the same option.

SENATOR PAMELA WALLIN

“We shouldn’t be leaving people in this illness lottery,” said Senator Wallin.

While Canada is on a short (but growing) list of jurisdictions that allow some form of physician-assisted death, the Netherlands is currently the only nation that specifically allows euthanasia for individuals with dementia. In April 2020, the Supreme Court of the Netherlands ruled in favour of a doctor’s ability to carry out euthanasia in those with advanced dementia under certain conditions, which includes the requirement for patients to make their request in writing before the disease is so advanced that they can “no longer express their will.”

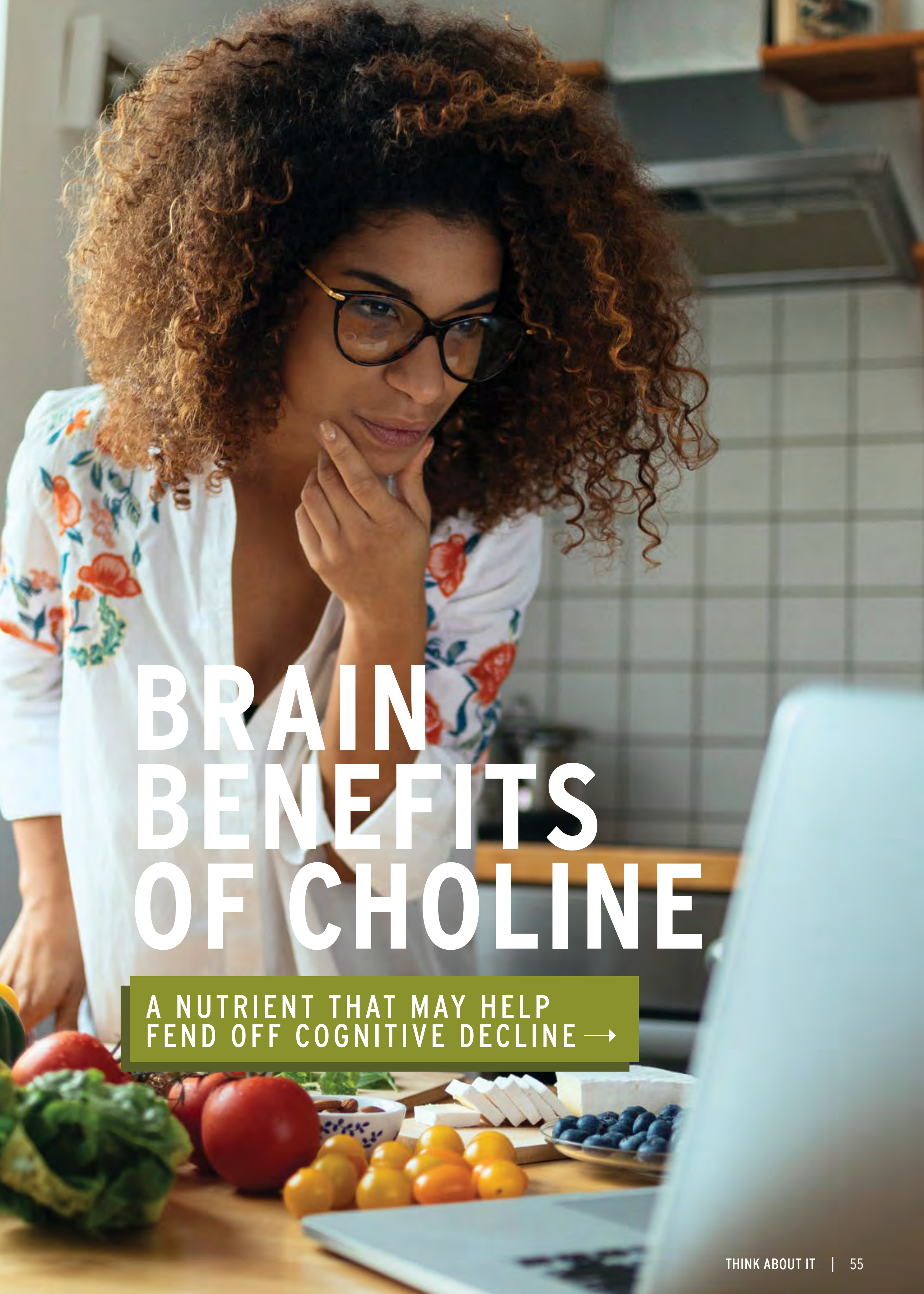
Aside from the Netherlands, then, the options for individuals with dementia who wish to control their time of passing are grim.

Posno shared the heartbreaking story of a former autoworker from Windsor, Ontario who remained active in retirement as the neighbourhood handyman. Despondent after receiving an Alzheimer’s diagnosis, he sequestered himself in his kitchen, and rarely left the house. His daughter contacted Posno to inquire about MAiD, referring to it as a “beacon of hope.” Unfortunately, Posno had to tell her that MAiD was not available.

“That night, her father pushed his motorcycle down to the road, rode down to the Detroit river, and jumped in.”

On March 17, 2021, Bill C-7 received Royal Assent and became law. Although the amended legislation does not allow individuals with dementia to make advance requests, a parliamentary committee will be reviewing the issue further – leaving Ron Posno to fight on.

“If the legislators persist with their folly, we will be forced to undertake the unnecessary costs of bringing a case right back to the Supreme Court.”



BRAIN BENEFITS OF CHOLINE

A NUTRIENT THAT MAY HELP FEND OFF COGNITIVE DECLINE →

Are you getting enough choline? More likely than not, this nutrient is not even on your radar – and if you have not heard of it, then you are not alone. Choline is often described as being both under-consumed and under-appreciated.

Choline is an organic, water-soluble compound that affects several vital bodily functions, including liver function, muscle movement, metabolism, and overall brain development, making it one of the essential nutrients for optimal brain health.

Although it is neither a vitamin nor a mineral, choline is often associated with the vitamin B complex due to its similarities.

Choline is a recently discovered nutrient. In fact, it was only acknowledged as a required nutrient by the Institute of Medicine in 1998. According to the National Institutes of Health, choline is needed to produce acetylcholine – an important neurotransmitter for memory, mood, muscle control, and other brain and nervous system functions.

The brains of individuals with Alzheimer's have lower levels of acetylcholine than those without the disease, and the medications used to treat the early stages of the disease – for example, donepezil (Aricept), galantamine (Reminyl), and rivastigmine (Exelon) – work by blocking the enzyme cholinesterase, which dismantles acetylcholine.

THE RICHEST DIETARY SOURCES OF CHOLINE INCLUDE:

- **BEEF LIVER**
  1 SLICE (2.4 OZ) CONTAINS 290 MG.
- **CHICKEN LIVER**
  1 SLICE (2.4 OZ) CONTAINS 222 MG.
- **EGGS**
  1 LARGE, HARD-BOILED EGG CONTAINS 113 MG.
- **FRESH COD**
  3 OZ FILLET CONTAINS 248 MG.
- **SALMON**
  A 3.9-OZ FILLET CONTAINS 62.7 MG.
- **CAULIFLOWER**
  A 1/2 CUP (118 ML) CONTAINS 24.2 MG.
- **BROCCOLI**
  A 1/2 CUP (118 ML) CONTAINS 31.3 MG.
- **SOYBEAN OIL**
  1 TBSP (15 ML) CONTAINS 47.3 MG.

Choline also plays important roles in modulating gene expression, cell membrane signaling, lipid transport and metabolism, and early brain development. Choline has been found to impact memory, mood, and intelligence, and some evidence even suggests that a lack of choline may affect the development and treatment of certain mental health conditions such as anxiety and mood disorders.

In one observational study published in 2013 in the *British Journal of Nutrition* (involving nearly 2,200 participants between the ages of 70 and 74 years old), those with higher choline levels had better cognitive functioning than participants with lower choline levels.

> **ALTHOUGH YOUR BODY CAN PRODUCE SMALL AMOUNTS OF CHOLINE THROUGH YOUR LIVER, IT IS IMPORTANT TO OBTAIN CHOLINE FROM YOUR DIET IN ORDER TO AVOID DEFICIENCY AND IT SEEMS THAT MANY OF US ARE NOT CONSUMING THE RECOMMENDED INTAKE OF THIS NUTRIENT.**

Indeed, it has been reported in a recent study published in the *Journal of the American College of Nutrition* that approximately 90% of Americans are not getting enough choline.

Choline is found in liver, chicken, milk, eggs, saltwater eggs, kidney beans, soybeans, and other legumes, cruciferous vegetables, some nuts and seeds, and whole grains. While exact requirements may vary depending on the individual, the recommended intake of choline is approximately 425 milligrams per day for women and approximately 550 milligrams per day for men.

Premenopausal women may require less choline from their diets than children or other adults, since estrogen induces the gene that catalyzes the biosynthesis of choline. For this reason, though, postmenopausal women may be at a greater risk of choline deficiency, since estrogen levels tend to drop at this stage. Other individuals who

For great-tasting choline-rich and other brain-healthy recipes, visit memorymorsels.org, a Women's Brain Health Initiative.

are at an increased risk of choline deficiency include athletes and those who consume an excessive amount of alcohol.

In a study published in the December 2011 issue of the *American Journal of Clinical Nutrition*, researchers found that participants with lower choline intakes were more likely to be on a "pathway" toward mental decline when compared to those with higher intakes of the nutrient.

Additionally, individuals who consumed higher amounts of choline in their diets performed better on memory tests and were less likely to show brain changes associated with dementia. Researchers caution, though, that these findings do not mean that choline is the answer to staving off Alzheimer's disease. Rather, the study emphasizes the importance of consuming a healthy and balanced diet.

With that in mind, it is critical to remember that diet, along with a healthy lifestyle, can make a difference in how our brain ages and choline is just one component. These are key factors that are essential at all stages of health and brain development as we age.

The National Academy of Sciences recommends the following daily intake of choline, which varies based on one's age group:

0–6 MONTHS:	125 MG
7–12 MONTHS:	150 MG
1–3 YEARS:	200 MG
4–8 YEARS:	250 MG
9–13 YEARS:	375 MG
14–19 YEARS:	400 MG (FOR WOMEN) 550 MG (FOR MEN)
ADULTS (20+):	425 MG (FOR WOMEN) 550 MG (FOR MEN)
BREASTFEEDING WOMEN:	550 MG
PREGNANT WOMEN:	930 MG

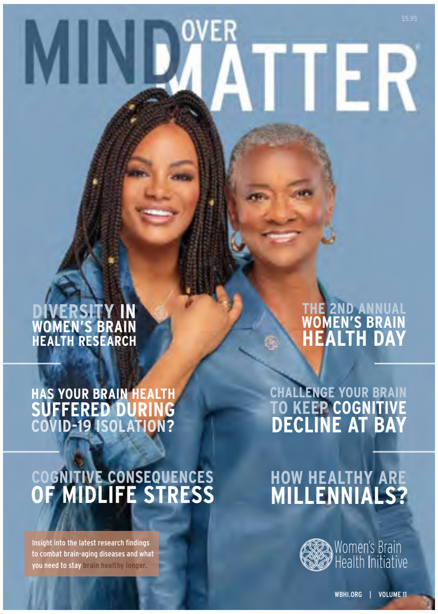
MIND OVER MATTER®

A PEEK INTO THE PAST

Since 2014, through our Mind Over Matter® publications, and thanks to the generous support of so many (including our partner Brain Canada), Women's Brain Health Initiative has been providing readers with the latest research findings to combat brain-aging diseases that disproportionately affect women and useful advice on how to stay brain healthy longer.

LOOKING FOR A BACK ISSUE? CONTACT US BY EMAIL AT MOM@WOMENSBRAINHEALTH.ORG.*

**while quantities last*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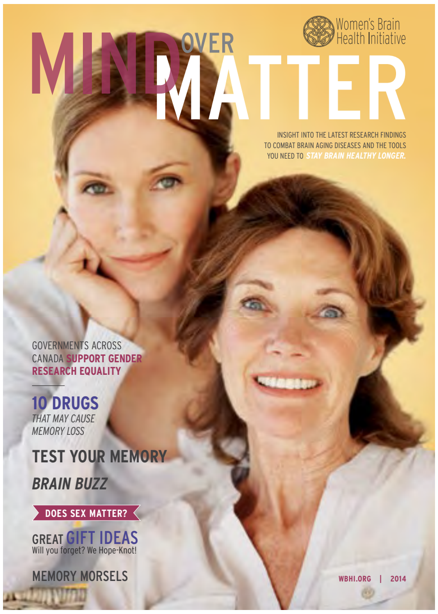
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ON THE COVER

WITH PATTIE LOVETT-REID & JANE LOVETT

For Pattie Lovett-Reid, staying both physically and mentally healthy is all about balance. It is the kind of balance she sought when she was the mother of young children, climbing the corporate ladder at TD Bank; the balance she learned from her mother, who coped with the early death of her husband while raising two kids; and the balance she sees in her daughter, Jane Lovett, who is caring for a baby boy in the midst of a pandemic. The three generations of women continue to support and learn from each other about health, career, and adaptation.

Pattie started working as a teller at TD Bank, with no university degree, and over a 31-year career worked her way up to Senior Vice-President. After retiring from the bank, she smoothly transitioned to broadcasting and is now a familiar face as the Chief Financial Commentator for CTV News.

Throughout her corporate career, Pattie always made sure to carve time out from her packed schedule for both family and personal health, including exercise, knowing that the bank was always going to demand its share too.

“I believe that if we don’t care for ourselves, if we aren’t healthy in body and mind, then we aren’t going to be good for anyone else, much less ourselves. I always made it a priority; I wrote it into my schedule,” explained Pattie.

Pattie and Jane spoke to Mind Over Matter® to mark their appearance on the cover, a conversation that was filled with laughter and shared memories.

“She’s broken many glass ceilings and it’s incredibly impressive to call her my mother. I’m very proud of her,” said Jane.

Pattie playfully interjected, exclaiming “I’m going to remind you of this later, Jane!”

Jane, fully immersed in motherhood with a newborn, noted that she has followed Pattie’s advice about the importance of time management.

“You’re all in with this little guy, but as my mother said, you need to make time for yourself,” she said. “For me, part of my well-being is making sure that I exercise. Whether that’s a 30-minute walk or an hour bike ride, it’s a priority. It makes me a better mother and a better partner.”

Jane is hoping to continue to make time for her physical and mental well-being when she finishes maternity leave and returns to her job as a fundraiser for a major hospital.

“I know that when it comes to time management, it’ll be a whole different ball game going back to work and having a toddler in daycare, but I’ve learned from one of the best,” she noted.

Both women were influenced by the example set by Pattie’s mother, Joyce Fraser. Pattie’s biological father passed away at the young age of 36, leaving Joyce alone to care for her two children under the age of ten. Joyce took on a full-time job at a grocery store and pushed ahead through grief and loss, leading by example to her children to make the best of life.

“Mom has always had a saying that has stuck with me since I was a very young child: ‘Only the boring are bored.’ She would encourage us to stretch ourselves,” said Pattie.

Joyce is still thriving, now in assisted living. Pattie boasted about her mother's skills as a terrific bridge player, who is now continuing to pursue her love of the game online.

"She really believes that it keeps her mind sharp and her mind is sharp," said Pattie.

Given the restrictions of the pandemic, Joyce asked for a smart phone and tablet to better stay in touch with family – instinctively acting to protect her brain health by adapting to technology to help maintain social connections.

"We were skeptical as to whether she'd get herself up and running, but she has – and I have witnessed this because she even liked one of my Instagram pictures," said Pattie. "She also told me about a few outfits that she didn't think too fondly of, but that's okay! She'll speak her mind, she's independent. I would say she is strong (or forceful, some might say). Along the way I have learned a great deal from her. But she is also open to new things."

Jane interjected to point out the parallels between her mother and grandmother in their recent embrace of technology.

"My mother said four or five years ago that 'I'm going to learn Instagram.' And I replied 'are you sure?', to which she responded, 'I'm going to post every day until I figure it out,'" recalled Jane, adding that Pattie now has over 22,000 followers on a social media platform that is usually perceived as being the domain of teenagers and millennials.

"It's so impressive that she's adapted to new technology. That's just another example of why she's so successful."

Along with Jane, Pattie has a son, David, from her first marriage. She is also a stepmother to her husband Jim's children, Carolyn and Kevin. She describes herself as a "camp counsellor" when they all get together at the family cottage in Muskoka.

"A perfect day for me is to get up and go for an hour and a half walk and talk to the kids, and Jane and I do a fair bit of that and then we exercise and go for another walk."

Pattie became involved with Women's Brain Health Initiative (WBHI) in the fall of 2020, when she was asked to co-host a virtual event in honour of the second annual Women's Brain Health Day and the Stand Ahead® fundraising campaign.

Hearing about the critical work of WBHI was an eye opener. "I learned so much along the way! I don't think we know enough about what we can control about aging." Pattie admitted to being ill-informed about the many ways in which we can help protect our cognitive vitality, but is now committed to being proactive. "It's this awareness of what you can do and how you can try to keep your brain healthy. I want to do everything I can."

Pattie was thrilled to have the opportunity to share the cover of Mind Over Matter® with her daughter. "It's a great honour," she said. "I've heard Jane say a lot of the things she has learned from me, and I learn from her every day. She forces me to stretch my boundaries."

"My mom and I do so much together. It'll be another great memory that we have together for an important cause," Jane added.

ON THE (BACK) COVER

WITH EPHRAM CHAPLICK, SARAH CHAPLICK & AMY CRYSTAL

Friday nights at the home of Ephram and Linda Chaplick have always been about family, food, and fun. It is their long-standing tradition to have their daughters Amy Crystal and Sarah Chaplick over for dinner (along with their respective husband and boyfriend), often followed by competitive board games – all infused with wide-ranging conversation and laughter.

More recently, though, they have begun to appreciate the unexpected benefits of their weekly dinners. Studies show that individuals who regularly engage in meaningful social interaction maintain their brain health better at all ages. Additionally, partaking in mentally stimulating activities (such as playing board games) may help reduce the risk of cognitive decline.

"Both Linda and I encourage our daughters to adopt and maintain a healthy lifestyle in order to help protect their cognitive vitality," said Ephram. "We are particularly cognizant of the importance of taking better care of our brain health due to our family history."

Linda's father, Dr. Henry Shanoff, was a well-respected cardiologist who experienced the early stages of mild cognitive impairment prior to passing away in April 2016 – just short of his 91st birthday.

"It was heartbreaking to witness my brilliant father-in-law exhibit the early signs of cognitive decline," recalled Ephram. "Our family would always say, 'Before there was Google, there was Henry Shanoff,' as he would look up every fact and word in his beloved dictionary and encyclopedia."

This eye-opening life experience coincided with the family's growing knowledge about the disparity between the sexes in dementia risk. Amy, a real estate lawyer at DelZotto, Zorzi LLP who specializes in land development and condominium law, started volunteering with Women's Brain Health Initiative (WBHI) as the contributing editor of Mind Over Matter® in 2016.

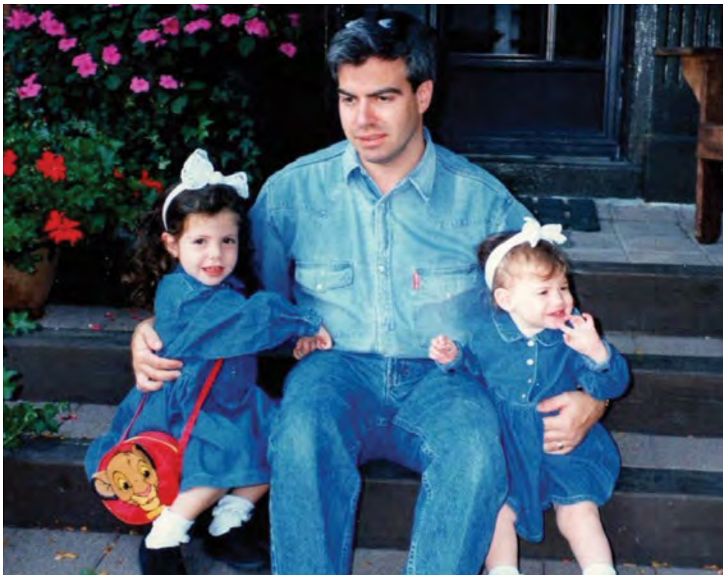
"It was astonishing to learn that the majority of research for brain-aging diseases has focused primarily (if not entirely) on men, despite the fact that women suffer from dementia twice as much as men, and an alarming 70% of all new Alzheimer's patients will be women," Amy noted.

"It was really shocking to discover that even after taking into account the difference in longevity, women are still at a higher risk of developing Alzheimer's disease than men," added Sarah, a Senior Coordinator at Lifetime Developments.

WBHI quickly became their family's charity of choice – donating annually and attending WBHI's unique and informative events. In honour of the inaugural Women's Brain Health Day, Ephram and Linda donated branded apparel for the Stand Ahead® Challenge (produced by Avid Apparel, where he is the Chief Operating Officer) to help combat research bias and stand ahead for women's brain health.

"Without WBHI and the efforts of Lynn Posluns (Founder and President), we wouldn't know nearly as much as we do today," said Ephram. "Under Lynn's dedicated leadership, WBHI has become a trusted voice across the globe for women's brain health."

It all resonated with Ephram as he thought about the women at the centre of his life. "It's a selfish motivation. I have a remarkable wife and two phenomenal daughters, and we must become aware of what we can do in our daily lives to help prevent this devastating disease."



CHEW ON THIS

HOW CELEBRITY CHEF MARK MCEWAN STAYS HEALTHY

Q: WHEN DID YOU START TO GET SERIOUS ABOUT YOUR HEALTH?
A: I always have been. I've always been athletic, worked out, and stayed active. My father was that way back when I was a kid. He was always into physical fitness, so it was part of our family regime.

Q: HOW DO YOU KICK OFF EACH MORNING ON A HEALTHY NOTE?
A: I probably drink too much coffee. It gets me going. I'm a coffee nut. My morning has to start with two Americanos. I catch up on the news and I'll usually work out around 8 o'clock. I'll do an hour with a trainer three days a week and I'll do another session on my own. So, I do four solid sessions a week, which I find is enough, especially at my age.

Q: HOW DO YOU MAINTAIN YOUR ENERGY THROUGHOUT THE DAY?
A: I find there's a lot of prickly static energy in the air these days with COVID-19. To counter that, I try to eat well and to drink less. I live a pretty clean life. I've never had an issue with energy, that's for certain. I wish there was more positive energy these days. It's starting to look like we've turned the corner.

Q: WHAT DOES A TYPICAL DINNER AT HOME LOOK LIKE FOR YOU?
A: I'll make fresh chimichurri and barbeque lamb chops. I'll also braise off some leeks and make a green salad. That would be a real quick dinner that will take me 20 minutes to throw together. I like eating chimichurri with protein because it's healthy and low in calories, rather than butter or cream sauces. I try to not eat too many tomatoes either because they are not the greatest thing for you and people don't realize this but there are resins on the inside of the cans that are not really good for your system from a chemical basis. Most of our meals at home are comprised of a beautiful simple protein and I love the onion-leek family, garlic, scallions, and roasting shallots. We eat a lot of that. I love a simple green salad, with just a good cask-aged red wine vinegar and good olive oil and fresh herbs. That's a typical McEwan meal.

Q: YOU MUST DINE OUT A LOT. HOW DO YOU MAINTAIN YOUR DIET AT RESTAURANTS?
A: I eat the same way when I dine out. I seldom ever eat from the main course column. I'll share a fish with my wife. I love eating crudo, raw seafood, raw fish, octopus – anything in those categories. I love a good broth. I always order a green salad. And that's a typical meal (unless I go to Fabbrica in Thornbury where I'll have a wood-burning oven pizza and handmade pasta, as well as fish). When you get to my age, you have your habits.

Q: WHEN IT COMES TO FOOD, WHAT IS YOUR BIGGEST GUILTY PLEASURE?
A: Chocolate. I'm really bad with chocolate. I'll eat a whole bar of 70% chocolate, thinking in my mind that it's good for me – and while there are some brain benefits, too much I know is not. At least it's good chocolate. I do have a weakness for that.

Q: HOW DO YOU MAKE SURE THAT YOU GET ENOUGH PHYSICAL ACTIVITY INTO YOUR SCHEDULE?
A: I just make time for it. I'm kind of master and commander of my own schedule. You have to fit it in, right? I make it happen somehow. It's nice when you run your own business, you can run your own calendar as well.

Q: DO YOU HAVE ANY OTHER HOBBIES OR INTERESTS THAT KEEP YOU FIT?
A: I love to ski. I'm an avid skier and avid road biker. I like to fast paddleboard. We have little race competitions up on Georgian Bay. Certain neighbours who think they're fast and we're all competitive. So, it's fun.

Q: HOW DO YOU FIND WAYS TO RELAX AND MANAGE YOUR STRESS LEVELS?
A: Stress is a hard one. It's always there. We have fun. We have dinner parties with friends. We're very social. We have a big circle of friends and it's nice to spend time with them. There's no greater way to relax and burn off some energy than doing a two-hour road bike or an hour paddleboard. Those are great ways to level the day out. I find physical activity is great for stress.

Q: WHAT ADVICE WOULD YOU GIVE TO SOMEONE LOOKING TO SUPPORT A HEALTHIER LIFESTYLE?
A: Stop lying to yourself. Most people eat too much, drink too much, exercise too little, and eat the wrong foods. The worst thing you can do is lie to yourself. So, one of the best things that you can do is just be honest with yourself. You are what you eat and people eat a lot.

Grilled Branzino with Capers & Mint

SERVES 4

INGREDIENTS

- 2 fillet branzino (Score the fish skin with 3 incisions)
- Salt and pepper
- 1 tbsp (15ml) combined minced oregano, thyme, rosemary, sage, and parsley
- 3/4 cup (175ml) olive oil
- 4 cloves garlic, thinly sliced
- 1/4 loaf focaccia
- 3 tbsp (50ml) salt-packed capers, soaked, rinsed, and drained
- 1/3 cup (75ml) torn mint leaves
- 1/3 cup (75ml) roughly chopped parsley
- 1 tbsp (15ml) chopped chives
- 1 lemon, cut into eighths

INSTRUCTIONS

1. Rub a generous pinch of salt into each incision of the branzino. Season both sides of the fish with salt and pepper. Mix the minced herbs with 4 tsp (20ml) of the olive oil and massage the inside of each fish with it. Reassemble the fish and set aside in the refrigerator.

2. In a skillet over low heat, gently sweat the garlic in 1/2 cup (125ml) of the olive oil until it wilts. Meanwhile, with your fingers, pull crouton-sized morsels of focaccia from between the crusts until you have about 1/2 cup (125ml). Remove the garlic from the oil with a slotted spoon and discard it. Raise heat to medium-low, add the focaccia, and cook until the croutons are crisp on all sides, about 5 minutes. With a slotted spoon, remove the croutons to a plate, salt lightly, and set aside. Allow oil to cool to room temperature.

3. In a medium high heat, non stick pan, add 1 tbsp of oil, and then place the fish skin side down. Let this cook for about 2 minutes, until the skin is crispy (you can use a metal spatula to press the fish down to avoid curling). Once the skin is crisp, flip the fish and cook the flesh side for about 2 minutes. Remove the fish from the heat. Set aside for a couple of minutes before plating.

4. Meanwhile, in a bowl, combine reserved garlic-crouton oil with the capers, mint, parsley, and chives; toss well. Spoon the mixture over the fish. Top each fish with a few croutons and 2 wedges of lemon.

Branzino

Branzino is a great source of Omega-3 and vitamin D, benefitting your body and your brain!

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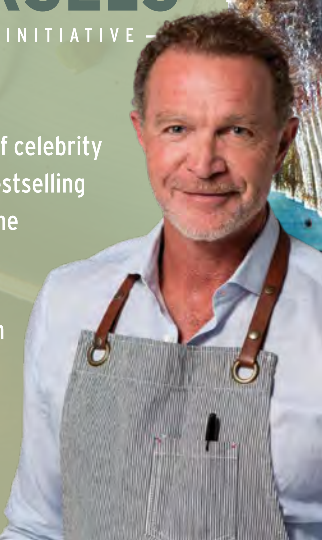

This edition's recipes are courtesy of celebrity chef Mark McEwan, a restranteur, bestselling author, mentor, and head judge on the Food Network's hit series Top Chef.

For more recipes and the latest from our Featured Foodie, Mark McEwan, visit memorymorsels.org.

Seasonal Green Salad Recipe

SERVES 2

INGREDIENTS

SALAD:

- **1/2 head yellow romaine hearts washed and torn into desire size (approx. -100g)**
- **4 to 6 leaves of Bibb lettuce (approx. 20g)**
- **1/2 pack of Belgian endive (60g)**
- **A handful of watercress (20g)**
- **1/2 pack radicchio or treviso (80g)**
- **10g fresh basil picked**
- **1 cup chef Mark's mason jar dressing (see recipe below)**
- **Pinch of Kosher sea salt to taste**
- **Pinch of cracked black pepper to taste**

VINAIGRETTE DRESSING:

- **4oz olive oil**
- **3oz red wine vinegar**
- **Juice 1/2 lemon**
- **1 1/2 garlic cloves minced fine**
- **2 anchovy fillets, minced**
- **1 tsp fresh thyme buds**
- **1 shallot, diced finely**
- **1 1/2 tbsp Dijon mustard**
- **Salt/pepper to taste**

INSTRUCTIONS

1. To make the dressing, place all ingredients in a sealable jar and shake (there is no specific order when adding the ingredients). Allow this to sit for one hour to blend all the flavors.*

2. To prepare the salad, remove the romaine leaf and Bibb lettuce from its core, rinse any dirt and drain any excess water. In the meantime, remove the leaves from the endive, radicchio, and discard the core. Cut all the lettuce to the desired size by using a knife or can break it into small pieces by hand. Mix in the watercress and fresh torn basil.

3. Top the salad with the dressing and add salt and pepper to taste. Toss the salad gently and serve.

** Mark typically makes a double batch to keep at home! This vinaigrette tastes delicious on almost anything and will last in the fridge for up to 2 weeks.*

Lettuce

Leafy greens contain brain-boosting nutrients such as vitamin K, lutein, beta-carotene, nitrate, and folate.

Jalapeño Margarita

SERVES 1

Jalapeños

Jalapeños are low in calories and a good source of vitamin C and B6, minerals, fibre and antioxidants.

INGREDIENTS

MARGARITA:

- **2oz Tequila**
- **0.5oz Cointreau**
- **1oz fresh lime juice**
- **0.75oz jalapeño simple syrup**

SIMPLE SYRUP:

- **1 cup sugar**
- **1 cup of water**
- **1 sliced jalapeño**

INSTRUCTIONS

1. To make jalapeño simple syrup, simply add 1 cup of sugar to 1 cup of water and add sliced jalapeños – the more jalapeno, the spicier it gets. Bring to a boil and simmer for 10 minutes.

2. To make margarita, pour tequila, Cointreau, lime juice, and jalapeño syrup into shaker tin. Add ice. Shake vigorously and pour into a salt-rimmed glass.

3. Garnish with a jalapeño ring and a lime wheel.

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You can support Women's Brain Health Initiative and be a champion for women and their brain health. Your charitable donation can further intensify our impact, allowing us to reach more and teach more.

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Women’s Brain Health Initiative

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

☐ $2,000 ☐ $1,000 ☐ $500
☐ $250 ☐ $100 ☐ Other $________

☐ I have enclosed a cheque payable to Women’s Brain Health Initiative

☐ I prefer to use my credit card

You can also donate online at ***womensbrainhealth.org/donate***

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