

Happy Holidays 2018

A Message from Dr Gammage

Every year when I start writing the annual newsletter, it provides the opportunity to reflect on all the things in the year to be grateful for, hopefully this years letter finds you happy, healthy and with lots of things to be grateful for too. Recently there has been some surprising discoveries and really interesting information coming out about the brain, so this year's newsletter has a bit of a theme. We've known for a while that "what is good for the brain is good for the heart" and vice versa. We see this dual benefit with all the vitamins, herbs, diet and lifestyle habits outlined below. Keep this "two for one" benefit in mind as you read through. In regard to clinic news, we are happy to introduce Anna-Spring. She has replaced Tiara, who is expecting a baby boy in January. Anna Spring has spent the last few years in the NW Territories but grew up on a maple syrup farm in Quebec. We would like to welcome her to the clinic and to Fort St John. On the family front, some of you have been with us since my kids were just little, so you may find it as hard to believe as I do that Liam is in grade 9 and Azaria not only drives now but graduates in June!! With the inevitable empty nest looming ever closer, time spent together as a family seems even more important. This year we took our adventures to Bali. We were there for the Hindu holiday "Nyepi". For a 24 hour period everything besides hotels shut down, even the airport and the internet!! No one was allowed on the streets, so we were confined to our hotel, which was no hardship due to the beautiful gardens, birdsong and outdoor pool at our small hotel. The use of electricity was also discouraged so the hotel was lit up by candle light after sundown thus, with no light pollution from the entire island, the night sky was absolutely amazing!!! Day of reflection ("Nyepi"). How we all could benefit in our busy western, none stop life from such a practice.

Science Proves Common Sense

In our busy, high tech, always linked in, convenient world, it appears we've lost touch with a lot of things that were just common sense to our ancestors. Things like getting a good night's sleep, exercising, eating healthy, spending time in nature and socializing in person with others are now the subject matter of research and scientific studies. Most people intuitively know they feel better when time is taken to attend to these basic things.

Unfortunately, there is often the perception, imposed either by our self or others, that these basic needs are indulgent or non-productive; science is showing quite the contrary. Studies prove that exercise reduces anxiety and depression, walking in nature improves the immune system, and proper sleep slows down aging of the brain. Advances in technology are allowing us insight into things we did not have access to years ago, and as a result we are gathering huge amounts of

information in regards to how we spend our modern day "down time" and its effect on our mental and physical health. If it takes research to give us justifiable permission to unplug from tech and take time out for ourselves, get 7-9 hours of sleep, go for a walk in the community forest or a take a couple of minutes to just breath, then bring on the studies! We will benefit as a society from both the short term and long term benefits.

Shinrin-Yoku



Since the 1980s, Japanese health care has incorporated the prescription of Shinrin-Yoku. Based on a robust body of scientific literature and research, this amazing and inexpensive therapy is finally gaining recognition through out the world. This therapy consists simply of spending time under the canopy of a living forest and a simplistic translation is "forest bathing". More accurately described as "taking in, with all of our senses, the forest atmosphere". Interestingly, the act of feeling the air on your

skin, smelling the air, hearing the birds and observing your surroundings etc. ~"with all our senses"~ brings a person into the present, likely activating the TPN (see page 4) and promoting mindfulness. Although it may sound new age or hippy-ish, the research shows undeniable benefits ranging from improved learning, quicker recovery time from illness and surgery, reduced aggression in teenagers, improved immune system function, reduced depression and anxiety, blood sugar regulation, reduced high blood pressure and even decreased risk of preterm births. Now, for us up here in

the north, there is a distinct lack of green in the winter. We do have the evergreens but its not the same as the forest canopy we are blessed with in the spring and summer months, however mother nature compensates by providing incredibly beautiful winter-scapes. Believe it or not there is health benefits seen when people feel "awed". Not sure how many people could look upon the thick hoar frost laden trees sparkling against the deep blue sky of a beautiful sunny northern winter day without feeling a sense of awe.



Fact or Fiction?

You only use 10% of your brain

We form all our brain cells by the time we are teenagers



Both of these statements are false, but to be fair they were considered facts until relatively recently. It was accepted as established fact that the brain stopped growing once we hit our early 20's. After that, dead or damaged neurons could not be replaced, thus starting

a slow but certain decline as we age. However, in the late 1990's, it was discovered that the brain does indeed continue to make new brain cells; a process called neurogenesis.

A key player in stimulating neurogenesis is a compound we produce called *brain derived neurotrophic factor*, more commonly referred to as BDNF. Since being discovered, researchers have been eagerly looking into ways of stimulating the production of BDNF. Turns out mother nature has the answers. In all her wisdom, mother nature has apparently adopted the KISS (Keep It Simple Stupid) template: diet, exercise, sleep and mindfulness are all keys to building brain cells. The volume of new discoveries and our understanding in the field of neuroscience has exploded in the last decade or two, once again reiterating that healthy lifestyle practices are very impactful in preventing both physical and cognitive decline as we age.

Stress Is Good & Bad For The Brain

As one might guess, chronic or extreme stress is not conducive to building brain cells. Not only does it turn down the rate of neurogenesis, but it produces compounds which are neuro toxic and can kill neurons. However, not all stress is bad stress when it comes to brain cell growth. In fact, moderate and short-term stressors actually stimulate BDNF. Included in this category are things like trying something new, (even if it challenges the boundaries of your comfort zone) and exposure to cold such as a cold shower or cold weather, which we have no shortage of up here. See, yet another silver lining to living in the north ;).

Exercise

Although all exercise types are beneficial for the brain, it appears that some have a stronger impact on BDNF production than others. Aerobic exercise in particular has profound implications for brain health. Studies show that jogging and cycling triple to quadruple BDNF production in the hippocampus (memory center)! Jogging is not an option for everyone, but higher intensity walks on the treadmill or cycling on a stationary bike will likely do the trick. As a point of interest, there is increased blood flow to the brain post-exercise, while BDNF levels are still increased, suggesting immediately after exercise is the perfect time to learn or take in new information.

The Power Of Emotions

Chronic anger, fear, anxiety and stress slow down neurogenesis whereas emotions that are associated with the hormone oxytocin stimulate neurogenesis. Emotions such as joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe and love are common positive emotions linked to oxytocin and are like fuel for neurogenesis.

Use It Or Lose It ~Brain Exercises

We need to be on going, life long learners. Learning new thing, as well as regular practice of meditation and mindfulness are all shown to increase BDNF and prevent cognitive decline. It is well documented that regular practice of meditation and mindfulness increases grey matter in areas associated with planning, problem solving, learning, and memory, while leading to a decrease in size of the amygdala (the brain region associated with fear and catastrophizing). Mindfulness is merely the act of focusing on something in your present moment; something as simple as observing the sensation of breathing in and out. Although simple in concept, the ability to stay focused on one thing can be quite a challenge initially. But just as physical exercise gets easier with regular work outs, so do brain exercises. Repeatedly redirecting the mind back to focusing on the breath after it has wandered off, as it inevitably will, is in itself the exercise of being mindful. And similar to physical exercise, one has to make "brain-workouts" a routine part of their life to get long term benefits.

Brain Builder All-Stars



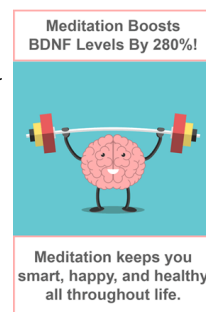
Omega 3 (EPA-DHA)

2/3 of the brain is made of fat and 1/3 of that is DHA ~one of the omega 3 essential fatty acids. EPA and DHA are two important omega 3 oils, which play a significant role in many biological functions including improving cardiovascular health, brain health and reducing inflammation. Inflammation is a disaster for the brain since it basically shuts off the process of neurogenesis. Omega 3 EFAs not only reduce inflammation but are also potent BDNF stimulators, DHA in particular can increase neurogenesis by 40%!

Foods High In Polyphenols Stimulate Neurogenesis

In addition to stimulating BDNF, polyphenols have antioxidant, anti-inflammatory and anti-carcinogenic properties. Polyphenols are a large class of naturally occurring compounds in fruits, vegetables, teas, cocoa and other plants. These compounds are divided into several subclasses, the largest being the flavonoids. Fruits and vegetables with lots of colour, especially dark colours, tend to be especially high in flavonoids and antioxidants. One fruit in particular known for its brain enhancing properties is blueberries, wild blueberries being the most potent.

The well-researched flavonoid in green tea called ECGC, potentiates the neurogenic action of BDNF. The equivalent amount of ECGC that would be found in 10-15 cups of green tea per day is ideal. Luckily ECGC




comes in a supplement form but if one did want to tackle the 10+ cups of tea a day, decaf green tea is recommended since even a minimal amount of caffeine slows down neurogenesis. Coffee too, shares this same conundrum. Studies involving the polyphenol in coffee, chloro-

genic acid, also shows favorable effects on BDNF, but again, the caffeine has an opposing effect. In a study published in the British Journal of Nutrition, chlorogenic acid in coffee fruit increased BDNF levels by 143

Stimulation of BDNF & neurogenesis is multifaceted. To maximize neurogenesis you want to increase foods and supplements that stimulate BDNF while avoiding the things that inhibit it.


More Fantastic Phenols

Another power house flavonoid is curcumin found in turmeric. Not only does it increase BDNF but research has found that it has antidepressant properties as well. It also acts as a neuroprotective compound and helps to prevent neural degeneration and associated cognitive decline through the aging process. The list of other health benefits associated with turmeric is lengthy and includes antioxidant, liver protective and anti-inflammatory properties. Although it is great to get in the habit of adding it to foods, turmeric is not well absorbed. Taking  with black pepper and a healthy fat can increase absorption and various supplement forms of turmeric have been modified to significantly improve bio-availability, such as Curcummatrix available at the clinic.

**Blueberries the
Brain Food**

The herb Ashwagandha has been shown to help support the natural repair of the nervous system while boosting levels of BDNF. In addition to helping the cells adapt to stressful conditions, it also increases the survival of brain cells. Rhodiola is fantastic for mental performance and clarity. One study showed that Rhodiola not only improve BDNF levels but more interestingly, this herb appeared to have a long lasting effect since BDNF remained elevated for a significant amount of time after Rhodiola supplementation had been stopped. At the clinic, Ashwagandha and Rhodiola are available in one product (Adrenal-Matrix). Resveritol (also available at the clinic), a phenol found in the skin of dark fruits such as grapes and berries, is also neuroprotective and a BDNF enhancer. Other things that boost BDNF and neurogenesis include magnesium, taurine, vitamin D, sulforaphane, acetyl-L-carnitine ("Carni-sorb") and NAC (available at the clinic).

BDNF Buzz Killers

Caffeine and sugar can have an adverse impact on brain cells. Not only does sugar reduce BDNF, but the lower levels of BDNF actually contribute to insulin resistance and impaired glucose metabolism. This has a snowball effect and can lead to diabetes and a whole host of health issues including Alzheimer's which some experts referred to as diabetes of the brain. Fruits and complex carbohydrates, however, are ok. 

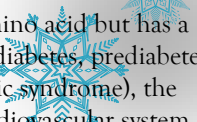
Next on the BDNF execution squad is caffeine. As mentioned earlier, the polyphenol in coffee helps BDNF but NOT the caffeine in coffee or tea. Caffeine, even in minimal amounts, impairs neurogenesis and although it may provide some temporary gains of short term memory increase, it appears to be a trade off since long term cognition is decreased with caffeine use.

Glymphatics

Probably one of the more significant areas impacted by modern day life is sleep. With the invention of electricity, the light bulb and technology, came the unwitting demise of healthy sleep habits. The relevance of a sleep deprived society has far reaching health consequences and a very recent discovery in neurophysiology (called glymphatics) reveals that sleep plays a significant role in brain health and prevention of neurological conditions. Towards the end of a full night's sleep, the neurons actually shrink in size by about 1/2 to 1/3 and the brain is flooded with cerebral spinal fluid which is packed with glial cells. These glial cells go along and pick up debris and toxins that have been produced throughout the day, and in particular they clear out beta amyloid. Beta amyloid is a protein that can form between neurons. It has a "sticky" nature to it and so, if not

cleared out regularly, it can accumulate into larger plaques in the brain. These beta amyloid plaques can interfere with brain function. Beta amyloid also reduces neurogenesis, so cleaning it out helps reduce the risk of cognitive decline, and conditions such as Alzheimer's. Discovered only within the last 2 years, this brain cleaning glymphatic system scientifically proves that sleep plays a MUCH bigger role in our life than just effecting our energy and productivity. In our busy lives there is often an unspoken perception that one can't afford the time to sleep more than 5-6 hours, but in light of this new discovery, how can we afford not to? You can't expect a neuron to be healthy if it is bathing in its own waste. Bottom line, sleep cleans the brain thus decreasing neuronal damage and death.

Tremendous Taurine

 Taurine is a simple amino acid but has a significant impact on diabetes, prediabetes (also known as metabolic syndrome), the brain, kidneys and cardiovascular system. Taurine stimulates the formation and survival of new brain cells in the part of brain associated with memory. Taurine also helps protect against neuron damage caused by aging, toxins and chemical exposure. It is also very important for the cardiovascular system. Research shows that supplementation with taurine produce dramatic improvement in heart and blood vessel function and has the added benefit in diabetics and prediabetics of reducing their elevated risk of kidney and cardiovascular disease. Levels decline with age leaving the brain, heart, kidneys and other tissues deprived of this vital nutrient. The findings that taurine can genuinely rejuvenate damaged brains as well as improve heart disease, is truly revolutionary. Taurine is available at the clinic in combination with magnesium and B vitamins in a product called MetaRelax. It's a powder that you add to your water but my family REALLY likes it in sparkling water.

Lemon Turmeric Balls

- 3/4 cup pitted dates
- 1 cup rolled oats
- 1/2 cup slivered almonds
- 1 Tbs chia seeds
- 4 Tbs lemon juice
- 1 tsp vanilla
- 1/3 cup shredded coconut for dusting
- 2 Tbs water (reserved from soaked dates)

Pour boiling water over dates and soak for 5 minutes to soften them. Drain and reserve liquid for later. Place dates in blender with 2 tbs of the drained date water as well as the rest of the ingredients except for the coconut. Blend until forms a dough like consistency (time varies depending on blender). If you find the dough really dry add 1 tbs or more of the date water. Form the dough into little balls and roll each one in the coconut. Place on a lined baking sheet and refrigerate until firm. Keep in the fridge until ready to serve. Can be frozen for up to 1 month

