Grow Your Brain with These 9 Tips

What is Neuroplasticity?

Neuroplasticity or Brain Plasticity is the ability of the brain to form new neural pathways or synapses. In layman's terms, consider that your neural pathways are like roads or highways on which information travels to and from areas of the brain for storage and recall. Neural pathways allow you to recall and store information on anything and everything: from what things are, to how to do things, to memories and other processes such as creativity.

The more we use a certain piece of information or skill set, the greater that neural pathway becomes; think of it as a multi-lane expressway. Information we rarely use and skills that we allow to dwindle, experience a corollary decline in the neural pathways leading to those area of the brain where that information is stored, similar to becoming an overgrown dirt road. Eventually, with lack of use, the brain will clear away the unused neural pathways in a process called synaptic pruning.

Every time we learn something new, our brain structure changes; new neural pathways (synapses are created to store and retrieve this new information. This is the brain's amazing plasticity, the quality of being easily shaped and molded. Our ongoing ability to create and retrieve new information is critical to man's new skills and information, our brain structure physically changes; transformations which are observable on MRI's.

Synaptic Pruning – Uncluttering the Brain

Synaptic pruning is the process whereby the brain recycles resources from old, unused neural connections, by shutting them down, and then diverting these resources to strengthen neural pathways that are in high demand. In order to focus resources on those areas of the brain that we use regularly, the brain prunes back those synapses (neural pathways) that are not in use.

One unfortunate example of synaptic pruning illustrates how the process works. In this instance, a new born baby's cornea was scratched during the birth process; a patch was applied over the scratched eye for a week to allow it to heal without light.

The child's brain perceived that this eye was no longer in use, while the other eye was functioning properly. The child's brain closed down all neural pathways to the injured and patched eye, believing that it no longer served a purpose, and diverted its resources to the "good" eye. The child's brain had "pruned" away all pathways from receiving information from that eye, as a result the child was permanently blind in the once patched eye.

Early Brain Development and Plasticity

In a newborn human child, there are approximately 2,500 synapses for each neuron in the cerebral cortex. By three years old, the synapses per neuron have increased dramatically to approximately 15,000. However, by adulthood the number has decreased to around 7000–8000 due to synaptic pruning.

Young children have high neuroplasticity, as they are constantly and eagerly absorbing information from their surroundings and learning new tasks. This is why young children learn second languages more easily than do adults attempting to learn a second language for the first time. Children's brains are in a growth phase, regularly generating new neural pathways or synapses. As we age this process slows, and appears to reverse. However, the exciting reality is that new synapses can be created at any time in life simultaneously with synaptic pruning.

Increasing Neuroplasticity as We Age

A study of randomly chosen individuals age 57-71 showed improved brain function after just 12 hours of strategic brain training exercises. Using MRI's of the participants brains both before and after, researchers saw upwards of an 8% improvement in blood flow and other indices that indicate improved brain function. Improved brain function included improved ability to strategize, remember and draw big picture conclusions from lengthy texts of information.

Remarkably, in a follow up study using MRIs again on the participants, researchers found that the benefits derived from the training session were still in place one year later. Enhanced synaptic plasticity means that we can think faster, listen better, respond to situations faster and concentrate with greater focus. Creativity is enhanced as well.

The Brain's Enemies!

Outside of toxins and injuries, stress is the greatest enemy of the brain. Prolonged stress results in increased levels of Cortisol and Adrenaline, which cause a variety of malfunctions across the human system. Cortisol alone can encourage weight gain impede neuron development and increase synaptic pruning across all neural pathways. Stress can actually cause brain damage.

The body cannot build new or replace dead neurons when it is in a constant state of stress. Under prolonged periods of stress, more than an hour, the brain begins to prune back the number of branches and synaptic connections of hippocampal neurons. As the stress continues, these conditions also increase the rate of cell death in this region of the brain, resulting in a reduced capacity for contextual memory.

We can't always control the sources of our stress, but we can control how our bodies respond to external stresses.

Growing Your Brain | How it Works

We can increase our brain's neuroplasticity at any time in our lives. By simply staying engaged in new activities, learning new skills and interacting with other people, we see beneficial effects across the Brain's structure.

The trick is to challenge the brain and force it to think in new ways and about new things. Even activities such a juggling, knitting, bicycling, learning a new language, taking an art class, tango dancing and 3-dimension puzzles challenge the brain by making simultaneous demands on various parts of the brain known as whole brain thinking.

The key to neuroplasticity is to learn new things everyday. Regular learning changes the brain's structure, improves our speed of thought, decision making abilities and comprehension of events as they occur around us. In other words, what flows through your mind, sculpts your brain. Many of these tips can also help you reduce your stress levels, which is critical to healthy brain function.

Tip #1: Engage in New Challenges and Develop "Whole Brain Thinking"

When faced with something that seems unfamiliar or difficult, go for it. Dive in, and attempt to master a new technique, language, computer program, hobby or physical activity. In particular try to find activities that employ both hemispheres of the brain, known as whole brain thinking.

For example, the **left hemisphere** reads words sequentially from left to right. At the same time the left side of the brain is decoding each word, the right hemisphere is interpreting the contextual meaning of the words. The right hemisphere allows us to see many things at once and create a holistic picture of details gathered by the left brain.

In addition, the left hemisphere controls the ridge side of the body, and the right hemisphere controls the left side of the body. This is why ambidextrous activities such as juggling and playing musical instruments enhance whole brain thinking.

By learning and practicing activities that force us to use both hemispheres, we continually become more adept at whole brain thinking. MRIs reveal that learning to play a new musical instrument or learning a new language, computer or spoken, increases the size of the engaged areas of the brain.

Ultimately this new capacity spills over into the other areas of our lives. Whole brain thinking lights up creativity, improves physical coordination and heightens instincts and intuition.

Tip #2: Practice Focused Attention

When you fully focus your attention on objects, events, new information or conversations, neuroplasticity is heightened. Focused attention, in contrast to “listening with one ear,” sucks information into the brain.

Pay close attention to the details of your environment and nuances in conversation. When presented with new information, reflect on what you have learned and try to remember the important points or aspects of the new information. Each new tidbit of information creates new neural pathways in the brain. Reflecting on and remembering the information strengthens the new neural pathway.

Activities which involve fine motor movements such as knitting, painting, drawing, arts and crafts, wood working, model building can all help build “whole brain thinking” as well as to help with improved concentration.

Tip #3: Explore with Childlike Wonder

Exploration is an attitude towards experiencing one’s environment. Rather than just moving from point A to point B; exploration challenges us to investigate our surroundings.

If you like to walk or bike ride for exercise, choose new locations for your outings. Pay attention to the details of the path, the flora and the people you come across ***as though you are seeing them for the first time***. Engage these new people you encounter with a smile or a nod as you pass by. Visit new areas and travel if possible.

If you travel, you may have noticed that you seem more exhausted than you might normally feel at home at the end of each day. Travel challenges us to absorb substantial detail while exploring new environments. While traveling, try to adopt the customs and practices of those you encounter during your journey. Explore historical sites, different religious centers and museums. Take guided tours, and remember to focus your attention fully while exploring.

Tip #4: Exercise 3-4 days a week for 30-45 Minutes Per Session

Adding moderate exercise to your routine improves not only our physical condition, but our brains benefit as well. Exercise improves circulation and reduces stress, thereby improving blood flow and oxygen to the brain. The brain uses a remarkable 20% of the oxygen we take into our bodies. Even just walking for 30-45 minutes will improve blood and oxygen flow to the brain, aiding neuroplasticity. During exercise our brain begins to create BDNF (brain derived neurotropic factor) which is like Miracle Grow for our synapse.

Remember, taking in the scenes during your walk and noticing the detail and changes in the neighbourhood, encourages whole brain thinking. Walking or biking and even working out in a gym, while watching an information program on the television packs a powerful two-fold punch in brain function improvement.

Tip #5: Protect Your Brain – Learn to Mediate

Meditation is a great stress reliever, and it has many interesting beneficial effects on the actual brain's structure.

Meditation increases the thickness and strength of the frontal cortex of the brain. As we age the frontal cortex decreases in size; studies show that those who mediate experience less of this decrease in the frontal cortex.

Mediation is known to reduce stress and cortisol in the system. It also boosts the immune system.

If you don't know how to mediate, there are downloads or CDs available that will guide you through the process. With the assistance of electronic sounds and music, the listener's brain is taken into alpha wave patterns, then down to the theta wave patterns (which we employ in dreams and memory) and finally down to delta wave patterns (patterns of dreamless sleep).

Tip #6: Develop Stimulating Friendships

As we age, we tend to seek out those things we are familiar with, including friends. One of the more enjoyable tasks in improving neuroplasticity is making new stimulating friendships.

Joining groups with a common interest such as a book club, bird watching group or travel group can lead to stimulating friendships centered on the exchange of new ideas and a shared appreciation of the activity.

Teaching, sharing and empathizing are all activities that boost new neural development. Empathizing, the art of mirroring the emotions of another, and compassion encourage our brains to explore new emotions and perspectives.

Tip #7: Laugh Often

As mentioned earlier, prolonged stress is the enemy of the brain. To be truly effective, brain training requires that the individual be in a positive mindset. Few things help us change our frame of mind better than a good laugh.

Laughter has a natural healing capacity. It reduces stress and produces an overall sense of well being. Laughter can move us into a positive frame of mind prior to beginning any brain training exercises. Furthermore, laughing to mentally challenging and complex humor involving paradoxes and surprise turns of phrases amps up the increases in neuroplasticity as well.

Tip #8: Water and Feed Your Brain to Make It Grow

If you want to think faster, be more creative and live life to the fullest, you will want to begin by feeding your brain good nutrients. While the brain weighs on average only 2% of our total body weight, it consumes up to 20% of the nutrients we take into our bodies.

Studies have shown these following foods have maximum beneficial effects of our brains.

- **Walnuts and raw almonds** are great for the brain and delicious to eat. Substitute almond milk in your breakfast cereal to jump start your brain for the rest of the day.
- **Jolly Green Giants** – leafy dark green vegetables such as kale, spinach, collards and even romaine lettuce slow the rate of cognitive decline.
- **Dark Chocolate** – the flavonoids contained in dark chocolate improve circulation which helps speed oxygen to the brain.

- **Monosaturated Fats**, such as olive oil actually slows down brain aging. Enjoy avocados, another source of monosaturated fats; they improve vascular health and circulation.
- Eat more **cruciferous vegetable** such as broccoli, cauliflower, cabbage and brussels sprouts. Studies have shown that people who eat a lot of cruciferous vegetables and leafy green have a slower rate of cognitive decline.
- Indulge in foods rich with **Omega 3's** such as salmon, sardines, lentils and flax seed.
- **Eat more berries**; the more colorful the fruit, the better it is for your body. Enjoy at least one serving of fruit a day.
- **Stay hydrated**. Dehydration can lead to impaired cognitive function.

Tip #9: Practice Positive Forward Thinking

You can physically increase those areas of your brain's structure that generate positive thoughts and emotions. By practicing framing positive thoughts and practicing taking positive action, we can begin to create increases in the size of the areas of the brain that generate positive feelings.

With practice, we can make ourselves naturally happier and more positive people. Conversely, engaging regularly in negative thinking has the ability to grow the areas of the brain that produce negative feelings, unleashing a downward spiral.

The idea is to take the negative thoughts, those that convince you something cannot be achieved, and are associated with fear of failure, and turn them into positive actionable thoughts. ***Ex: "Yes, I am sad now, but, I can take my dog for a walk and enjoy his/her sense of pleasure at being outside sniffing around and know that I am making my dogs life more enjoyable."***

We learn through both positive achievement and through failure. Failure is a normal part of developing any new skill or ability, so embrace it positively, and view it as a learning experience.

When you feel anxiety embarking on a new endeavour, **use the three R's to rename, reframe and redirect**. Actively rethink the situation to take it from a stumbling block to an achievable challenge in your mindset.

Even simple changes such as changing your computer passwords to "positive words or phrases" like **Iamhappy!** or **Iamjoyful2** have been shown to have beneficial results. Another option is to take a few minutes every day to "practice" being positive or forward thinking, or to imagine what it would be like if you were a positive or forward-thinking person. The beauty of practicing positive or forward thinking is that **you do not** need to believe it 100%, even 1% buy-in can begin the change.

Do Online Brain Training Games Work?

In the short term, brain training games do provide benefits to increase neuroplasticity. However, over time as the games become more familiar the benefits diminish. At the point where you realize that your scores are improving due to practice and familiarity with the game's constructs, the benefits decease proportionally to the ease with which the game is mastered.

Furthermore, brain training games, which may be enjoyable, do not enhance the quality of the individual's life. No new information is learned nor skills created, for those who enjoy playing games for the game's sake, the games hold value. For those seeking to improve their brain plasticity who do not particularly enjoy games, the online systems are a time drain.

Many of the tips listed above merely require that you open your eyes and ears to improve your attention to detail, make better choices in nutrition and accentuate the positive as you move through your normal routine. Best of all they are free and easily adapted in your life.