

# Food for Thought

The brain has approximately 100 billion neurons, with an estimated 100 trillion connections. Until recently, it was believed that when you lost brain cells, they were gone forever. It has recently been discovered that stem cells, capable of turning into new neurons, are present in many regions of the brain. Under suitable conditions, stem cells can become active and make new circuits in the working brain, and in experiments with animals who had undergone strokes, new nerve cell formation, new circulation, and a degree of recovery are seen in the damage zone.

Exercise seems to be a key factor in releasing growth factors that stimulate stem cells scattered throughout the brain to make new neurons and circuits. It seems that when we exercise, we release BDNF (brain-derived neurotropic factor) which acts like “miracle grow” on the brain. Studies done with children in school showed higher test scores with those who started out the day with aerobic exercise. Anxiety, depression & ADHD have all decreased after the implementation of exercise regimes.

Neurons like other cells, have a membrane that is made up of protein & phospholipids (phosphorus & fatty acid components). The fatty (lipid) portion of the brain contains a high percentage of omega-3 fatty acids such as linolenic acid, EPA and especially DHA. Solid research is linking deficiencies of omega-3 fatty acids with depression, anxiety, and other clinical problems treated by psychology. The phosphorus component contains high amounts of GPC (glycerophosphocholine), and PS (phosphatidylserine), which can be supplemented, and/or obtained through diet. These help with nerve transmission, and as one researcher commented about his tennis game, “it makes the ball slow down”.

New studies are pointing toward nutrients that protect the brain from the ravages of oxidation, oxygen deprivation or Alzheimer’s; and they all seem to be **purple**. Polyphenolic compounds from pomegranite, the resveratrol found in grapes, and the bioflavonoids found in blueberries have all been found to be protective and even able to reverse some of the brain changes associated with cognitive decline. Nutrition for the brain includes:

Omega-3 fatty acid containing foods such as:

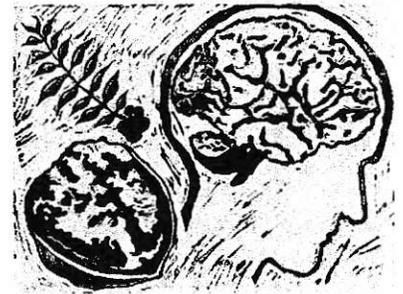
- Wild, cold-water fish (or fish liver oil, or phytoplankton)
- Almonds (unroasted is best, as unsaturated fats like omega-3 oxidize easily with heat.)
- Walnuts (For centuries, the “doctrine of signatures” has guided people to plants or foods thought to resemble the appearance of the organ they feed or heal. See the brain?)
- Seeds (Pumpkin, sunflower, flax, sesame, or virtually any seed)
- Green plants of any type

Phosphatidyl-serine and phosphatidyl-choline containing foods such as:

- Wheat germ (germ from most grains, which is also high in B-vitamins)
- Eggs
- Peanuts
- Soybeans

Bioflavonoid and polyphenolic rich fruit and vegetables such as:

- Pomegranate
- Blueberries and blackberries
- Grapes & red wine
- Purple cabbage



At the Mountain-River Naturopathic Clinic, we have teamed up with **Neuroscience Laboratory** to offer salivary tests of neurotransmitter levels. Neurotransmitters are most often derived from amino acids, and knowing which ones are high or low can be useful in targeting therapy for specific conditions. Some of the neurotransmitters tested include:

- **Glutamate:** a common amino acid that functions as the primary excitatory neurotransmitter in the brain. It is important in learning, memory, cognition, mood, sleep, and may be linked with focus, concentration and insomnia. Interestingly, glutamate is found commonly in foods containing MSG (mono-sodium glutamate), and goes by many names like “hydrolyzed vegetable protein” (such as Bragg’s liquid aminos), autolyzed yeast, L-glutamic acid, whey protein powder, often derived from dairy. Excess glutamate is considered excitotoxic, having been associated with a number of neurodegenerative disorders.
- **GABA:** an amino acid that is the primary inhibitory neurotransmitter in the brain, which makes it important for regulating the stress response.
- **Dopamine & norepinephrine:** excitatory neurotransmitters that are important in mental focus, mood regulation and motivation. They are both synthesized in the body from the amino acid tyrosine.
- **Serotonin:** our daytime “feel-good” neurotransmitter, which is converted to melatonin at night. Melatonin is our “sleep hormone” which also acts as an antioxidant for regeneration of many tissues. Both serotonin & melatonin come from the amino acid tryptophan, which can be found both in protein rich foods, and supplements. We find the 5-HTP form of tryptophan gives us our best clinical results.

At the Mountain-River Naturopathic Clinic, we often turn to the medicinal properties of various herbs that have been used for generations, if not centuries, for their effects on the brain. Ginkgo biloba, gotu-kola (centella asiatica), and rosemary (Rosmarinus, “the herb of remembrance”) are all used for cerebral circulation and aiding memory. Others like skullcap (Scutellaria), passionflower (Passiflora), and motherwort (Leonurus cardiaca) are used for calming an anxious mind and heart.

We can help you with everything but the form of exercise that you choose. That choice is up to YOU. Get out there and make some “miracle grow” for your brain. Then, put the new neurons you made to use, so you can “plug them into circuits” and keep them!