

Brain Health – Bonnie Camo, M.D.

The factors needed to maintain brain health are food, including nutritional supplements, exercise, brain exercise, and stress reduction.

Most people don't eat enough fruits and vegetables. Why do we need them? For their color! The colors that give beauty to flowers, vegetables and fruits are not only pleasing to look at, they are necessary for our health. The brighter the color, the more antioxidants. We need antioxidants to fight substances called "free radicals". These are not '60's campus activists, but supercharged oxygen molecules that race around cells reacting with everything in sight. They damage DNA, cause mutations and cancer, inactivate enzymes, and make fats rancid, especially in the brain. This damage all adds up to produce aging. Antioxidants "mop up" free radicals, protect cells, and slow aging. Antioxidants come in all colors and we need them all. Red lycopene in tomatoes and red fruits, carotene in orange vegetables, lutein in yellow things, chlorophyll in everything green, anthocyanin in blueberries, and resveratrol in purple grapes and red wine made from them. Eat a Rainbow every day. And avoid colorless white food! (sugar, flour, rice)

Protein is vitally important for the brain as the source of amino acids that the brain uses to make neurotransmitters that send information around the brain. Tyrosine, abundant in all protein foods, is the precursor of dopamine, noradrenaline, and adrenaline, the brain's natural "uppers", needed for energy, memory, enthusiasm, and preventing depression. To stay alert, it's good to have protein for breakfast and lunch, like organic eggs, turkey bacon, fish like sardines and salmon, natural peanut butter with whole grain bread or muffins, or a protein drink.

Tryptophan is the amino acid that produces serotonin, needed for calmness, contentment, and avoiding anxiety and depression. Although tryptophan comes from protein, by a trick of biochemistry, it is carbohydrates that make tryptophan enter the brain to make serotonin. Many people crave carbs as a natural stress reliever. Carbs are good to have in the evening to promote relaxation and sleep. Avoid refined carbs like sugar and white flour which are devoid of nutrients and cause blood sugar imbalances. Use whole grains like brown rice along with legumes like beans, peas, and lentils to provide complete protein along with healthy, low glycemic carbs.

A very common cause of failing brain function is a deficiency of omega 3 fatty acids, or an excess of omega 6 from vegetable oils, and saturated fat from meat and dairy products, and abnormal man-made factory fats. One reason is that saturated animal fat, as well as excessive amounts of omega 6 oils, promote inflammation, now thought to be at the root of our most common chronic diseases like cancer, cardiovascular disease, and Alzheimers. Omega 3's from fish and flax oil are anti-inflammatory and help prevent these conditions.

The human brain is fifty percent fat, mostly omega 3, DHA, which is best supplied by cold water oily fish like sardines, salmon, mackerel, and bluefish. Omega 3 oils stay fluid in cold temperatures and act like natural antifreeze, keeping the fish, and those who eat them, flexible, especially their brains. Brain cell membranes and synapses are largely composed of DHA. Unnatural fats, like trans-fats found in hydrogenated oils, margarine, supermarket peanut butter, and most commercial baked goods, stiffen and gum up cell membranes in the brain, heart and rest of the body, and should never be eaten. New labeling laws now require the amount of trans fats to be listed, although they can get away with a certain minimum.

Vegetable oils like sunflower and safflower were once thought to be healthy, but they are too high in omega 6. We evolved on a diet of equal amounts of omega 3 and 6, which is ideal for our brains, but the modern American diet now contains 20 times as much omega 6

Brain Health – Bonnie Camo, M.D.

as 3. Olive oil is mostly omega 9, which is neutral in the brain war, and is one vegetable oil that has some benefit for the heart and brain. It will not substitute for omega 3, but it will not cause harm like many vegetable oils which are high in omega 6. Fish oil supplements of omega 3 DHA and EPA may be beneficial, but there is no point in taking supplements with omega 6 and 9.

Fish really is brain food. According to the Aquatic Ape theory, it was a diet high in seafood that allowed our human brain to develop. Recent research has found supplementation with fish oil very effective in treating depression, including manic depression or bipolar disorder, and helping to prevent memory loss with aging. I have found this very useful in my own practice. Vegetarians can get some omega 3 oils from flax oil, and flax seed, cooked greens, beans, and DHA supplements made from algae.

To maintain brain health throughout life, in addition to the right food, the brain will benefit from nutritional supplements, exercise, brain exercise, and stress reduction. Antioxidants are very important, and we get a lot of them from colorful fruits and vegetables. Another surprising big source is tea, which has been called 'the thinking human's drink'. (I was very glad to hear that, because I love tea.) Another surprise: black tea has more antioxidants than green tea, about 80% more, according to Jean Carper in *Your Miracle Brain*. Powdered tea mixes, and bottled tea drinks have little or none, and decaf tea has half as much as regular black tea, according to Tufts University research. To help balance the caffeine, tea also contains L-theanine, which has a soothing, calming effect on the brain and has been called 'instant Zen', useful for relieving stress and, taken in capsule form, promoting restful sleep.

Another delightful source of antioxidants that help protect the brain is dark chocolate, which also contains natural antidepressants like phenylethylamine (PEA), and Anandamide, (meaning 'inner bliss') which works on the same brain receptors as marijuana, producing heightened sensations and euphoria, which may account for chocolate cravings. One ounce of dark chocolate is a healthy amount for people who can tolerate it without developing an addictive relationship with it.

Red wine in small doses, one glass a day for men, ½ glass for women, helps prevent free radical damage and memory loss and prevent strokes. Of course, too much alcohol kills brain cells. Like chocolate, a little goes a long way.

According to the *Journal of the AMA*, mild unrecognized vitamin deficiencies may cause subtle cognitive impairment in older adults. Mental functions like memory and problem solving were found to be directly correlated with blood levels of vitamin C and B vitamins like B6, folic acid and B12. People taking B vitamins scored better on tests of memory and abstract thinking. Studies at the University of Hawaii showed that elderly men who had taken vitamin C and E for years did better on cognitive tests. Research in Germany showed lower scores on mental tests in men and women over 65 who were low in any vitamin, especially C, B1, B2, and B12. They were also more likely to be depressed, anxious, angry, irritable, nervous and fatigued. As a precaution, everyone should take a good, high potency multi vitamin-mineral and perhaps extra B's (50 mg) and C (500 to 2000mg per day).

Vitamin B6 is especially important for the brain. It is required for the synthesis of neurotransmitters like serotonin, dopamine and GABA. Along with B12 and folic acid, B6 reduces homocysteine, which damages the heart and brain. B6 helps convert body stores of carbohydrate into glucose, the brain's only fuel. B6 helps circulation and improves memory.

Brain Health – Bonnie Camo, M.D.

Vitamin D has recently been recognized as a potent fat soluble antioxidant, even more powerful than vitamin E. Deficiencies of D have been found in Parkinson's and Alzheimer's disease. 400 iu was always thought to be adequate, but recent studies show that we may need 1000 or 2000 iu or more, especially in winter, when we can not benefit from free vitamin D from the sun.

Coenzyme Q10 is needed for energy production in the mitochondria, tiny 'spark plugs' in every cell where conversion of food into ATP, the chemical energy that fuels life, actually takes place. Co Q10 also works with vitamin E to prevent 'lipid peroxidation', destruction by free radicals of the liquid fats that make up half of the brain. Co Q10 also regenerates depleted vitamin E. Statin drugs prescribed to lower cholesterol cause depletion of CoQ10, so be sure to take Co Q10 (30 to 100 mg per day) if you are taking these drugs. Better ways of lowering cholesterol include taking vitamin B3, niacin, (use the 'no flush' form to avoid the harmless temporary skin redness and heat caused by niacin, although some people do enjoy the flush). Fish oil 2000-4000 mg per day, also helps lower cholesterol as well as triglycerides, in addition to its many other benefits to the brain.

Perhaps the most important and overlooked brain antioxidant is alpha lipoic acid. Unlike any other antioxidant, it is soluble in both fat and water. It easily passes through the 'blood brain barrier' and goes directly to brain cells under attack. It is the only antioxidant that can regenerate itself as well as other used-up antioxidants, vitamins C, E, coenzyme Q10 and glutathione. It also helps block production of sugar-damaged proteins called AGES (advanced glycation end products). It helps prevent and treat strokes and diabetic neuropathy. 200 to 600 mg a day is recommended.

Memory lapses and slower recall of names and words are not necessarily signs of impending Alzheimers. Depression, hypothyroidism, and nutritional deficiencies should be ruled out before imposing ominous diagnoses. Older people have reasons to be depressed, due to losses in their lives, of spouses, friends, abilities and resources. Depression is not a Prozac deficiency! But it could be a nutritional deficiency.

Vitamin B12 deficiency is very common in older people, causing symptoms like depression, anxiety, memory gaps, and confusion. B12 occurs only in animal products and requires stomach acid for absorption. Older people tend to have lower levels of stomach acid and digestive enzymes. People on acid blocking drugs for reflux are also at risk for deficiency of B12, as well as minerals that require acid for absorption.

Vegetarians and vegans get a lot of folic acid from fruits and vegetables, which could mask a B12 deficiency on a blood test. B12 supplements should be taken in sublingual form, dissolved under the tongue for direct absorption into the bloodstream, bypassing the GI tract.

Zinc is one of the most important minerals for the brain, needed for synthesis of neurotransmitters, and growth and repair of brain and body. Zinc is abundant in seafood, and may need to be supplemented by vegetarians. Zinc requires stomach acid or vitamin C for absorption. Zinc helps displace harmful heavy metals like lead, and mercury. Older people may have high levels of lead, which we absorbed from the environment before lead was removed from gasoline, and high mercury from dental amalgams most of us had put into our teeth as children. Lead is a neurotoxin that causes depression, insomnia, and poor memory.

Seafood is a good source of zinc and omega 3 good fats, but unfortunately, now is also a big source of toxic mercury. Symptoms of mercury poisoning, according to Alan Schumaker

Brain Health – Bonnie Camo, M.D.

in Homeopathy, the Home Handbook for Survival, include memory loss, shyness, timidity, loss of will power, indecision, lack of confidence, apathy, suicidal thoughts and violent impulses. Many common diseases of aging like Alzheimers, hormonal imbalances like hypothyroidism, autoimmune disorders, chronic fatigue, fibromyalgia, and psychological problems as listed above are now thought to be at least partly related to mercury and other toxic heavy metals.

Mercury released from burning coal in power plants falls in rain on land and water, ending up in rivers, lakes, and finally the sea. It enters the food chain, increasing in concentration as big fish eat little fish, ending up at the highest levels at the top of the food chain: whales, polar bears, and us. (Another reason to promote renewable, non fossil fuel energy sources like wind, solar, hydro and geothermal, provided respectively by the four ancient vital elements, air, sun, water and earth).

It used to be thought that we were born with all the brain cells we would ever have, that brain cells (neurons) were unable to divide and multiply like other cells in the body. It is now known that the brain is capable of growing new neurons throughout life, even in old age. Physical exercise is one thing that increases neurogenesis. The brain also grows new neurons when it learns or experiences something new. Using skills we have already mastered brings comfort, but doesn't make the brain grow. The mental decline many people experience as we grow older is not due to death of nerve cells, but it may be due to loss and thinning out of dendrites, nerve cell branches that connect with other neurons. It is now known that old neurons, when stimulated by novelty, can grow new dendrites to compensate for losses.

Brain exercise called Neurobics presents the brain with non-routine ways of using the various senses: vision, hearing, smell, taste and touch. The brain is hungry for novelty. Try breaking routine by getting dressed or showering with your eyes closed, taking a different route to work, or shopping at a farmers market instead of the supermarket. Combine senses, such as listening to a particular song while smelling a specific aroma. Use your sense of touch instead of vision to find the right key to open your door. Experiment with novel cuisines from other countries. Try eating with chopsticks. Start a new hobby. Learn a new language, a musical instrument, or how to use a digital camera. Any of these will stimulate the brain to grow new neurons and make new connections between neurons, keeping your brain young and healthy.