How to Improve Brain Health and Reduce the Risk of Alzheimer’s

Aging is an inevitable process that we go through, and it has the most profound effects on the brain. After the age of 40, the brain decreases in volume by at least 5% every decade, and this rate increases with age. This loss in volume translates to a loss of long-term memory, slower reaction times, decreased working memory, slower processing speeds, and detriments in sensory and/or perceptual function. These effects can be reduced and even reversed by addressing these four processes:

1. Neuronal Cell Death

In our adolescence, we have 1.5x more neurons in our brain than we do as an adult. As we learn and grow, our brains form new synaptic connections that allow our neurons to communicate. This allows us to do the things that we want to do efficiently.

As we reach our early 20’s, our brain starts to refine its connections. Underused neurons undergo apoptosis or programmed cell death. This is a natural process that allows us to remain good at what our environment requires us to do while unneeded neurons and synaptic connections are removed.

Neuronal cells can also be damaged and eventually die due to traumatic injury, environmental toxins, cardiovascular disorders, infectious agents, and genetic diseases.

2. Reduction in Synapses and Synaptic Plasticity

As we age, the amount of dopamine and serotonin in our brain decreases. This leads to a decrease in synapses (the connections that allow for communication between neurons.)

Brain-derived neurotrophic factor (BDNF) activity also decreases with age. BDNF increases our ability to form new synaptic connections (synaptic plasticity) and triggers the development of new brain tissue (neurogenesis).

3. White Matter Damage

The white matter of our brain is made of myelinated axons. These are like electrical cables that carry the signal from one neuron to another. As we age, the myelination (fatty insulation) of these axons deteriorates. This process is what reduces our reaction time as we age.

4. Impaired Vascular Function

The health of our circulatory system is as important for brain health as it is for heart health. The primary cause of impaired vascular function is oxidative damage that leads to inflammation and plaque build up. This process is caused by consistent exposure to environmental toxins, refined foods, trans fats, and/or head trauma. Damaged blood vessels lead to an easily permeated blood-brain barrier that allows toxins and infectious agents in. The brain’s ability to receive nutrients and remove waste (like beta amyloid plaque) will also be impaired.

Brain Aging and Alzheimer’s Disease

These four changes are largely to blame for the effects that aging has on our cognitive function. This process is accelerated to a catastrophic degree in people with Alzheimer’s disease.

Alzheimer’s Disease: Brain Aging Accelerated

What makes Alzheimer’s disease so catastrophic is that it accelerates the synaptic damage and neuronal loss common with aging, while impairing the regenerative properties of the brain. This leads to a rapid decrease in brain volume and function.

Many genetic and environmental factors lead to the accelerated damage of neurons and their synapses. In a brain with Alzheimer’s disease, this leads to the accumulation of beta amyloid plaque and damage of the neurofibrillary tracks that help move nutrients and other key materials throughout the cell. As plaque builds up and the tracks become tangled it leads to a snowball effect of neuronal damage and cell death throughout the brain. This unforgiving process is what makes Alzheimer’s disease the sixth leading cause of death among older adults.

Although genetics, specifically the APOE genes, play a major role in our brain health and the progression of Alzheimer’s, there are many things we can avoid, changes we can make, and treatments we can use to improve brain health and reduce neurodegeneration due to age and Alzheimer’s Disease.

Yes, you can teach an old dog new tricks, but first, we must understand what accelerates the aging of the brain and Alzheimer’s Disease.

How to Shrink Your Brain

Do the Same Thing Every Day

Every time we reach past our comfort zone by learning or experiencing something new, we increase the rate of neurogenesis and make new synaptic connections. On the other hand, if we do the same things every day without reaching beyond our competency, our brain will focus on pruning down its synaptic connections and more neurons will undergo apoptosis. As the process continues, your brain will become smaller and smaller.

Eat A lot Oxidized Polyunsaturated Fats and Trans Fats

When these fats enter our body they create chaos in the circulatory system which leads to an immune response to deal with the trouble that the oxidized fat and trans fat is causing. Our body handles these fats by depositing it as plaque which leads to atherosclerosis. This process also occurs in our brain, which contributes to the accumulation of beta amyloid plaque and tangling of the neurofibrillary tracks.

Eat Plenty of Refined Sugars

High blood sugar levels are associated with the increased risk of Alzheimer’s Disease. When blood sugar is high, the sugars tend to interact with the residues of proteins. Together they form glycation end-products (AGEs). These AGEs create oxidative damage and inhibit enzymes like macrophage migration inhibitory factor (MIF) that are important for protecting the brain aging.

Make Sure You Are Chronically Stressed

Although acute stress can enhance your learning ability, chronic stress impairs working memory and prefrontal cortex function. When the function of the prefrontal cortex is impaired, we cannot reason effectively, and our emotions can take hold and control us more easily.

Live in a Polluted Environment

The process of brain aging and Alzheimer’s disease is accelerated by the accumulation of metals in the brain. The primary way that this can happen is through the nose. Nanoparticles of metals from car exhaust, industrial pollution, and smoking can cross the olfactory areas of the brain and accumulate in areas, like the hippocampus that are most affected by Alzheimer’s Disease.

Drink Alcohol Every Day

Drinking alcohol accelerates the shrinkage of the brain, which leads to cognitive decline that mirrors the symptoms of Alzheimer’s Disease.

The best way to reduce brain aging is by eliminating the things from your life that age your brain. There are many other factors that contribute to brain aging that we have not discussed, but we know for sure that if you continue doing any of these six things, your brain will start shrinking rapidly.

How to Grow Your Brain & Keep It from Aging

Increase Your Physical Activity

Increasing your physical activity can improve brain volume and reduce the risk of Alzheimer’s disease by up to 50%. Even

people who had mild symptoms of Alzheimer’s disease increased their brain volume by increasing their physical activity. This means that you can grow your brain by simply taking a walk every day.

These profound effects are due to the fact the exercise helps reduce inflammation, anxiety, and insulin resistance, while stimulating growth factors (like BDNF mentioned above) that improve the health of your brain cells and blood vessels.

Do Something New Every Day

When we were children, we were filled with curiosity. Every moment was an experiment that led to a new discovery like walking or crawling. During this phase of development, our brains were primed and ready to form new synaptic connections, so that we could thrive in our environment. By the time we are in our 20s, our brains are almost fully developed, and we begin to form patterns and habits, leaving our curiosity behind.

As we age, we must stimulate our curiosity again by learning new things, going on adventures, and reaching outside of our comfort zone every day. This will trigger a process in the brain called scaffolding, which stimulates the brain to form new connections with different neurons in new ways. This allows the brain to function more efficiently and age gracefully.

Drink Coffee or Tea

Habitual caffeine intake may protect against cognitive impairment. In studies done on mice, caffeine has been found to suppress the buildup of beta-amyloid plaque in the brain. On the other hand, OLM’s stance on coffee is not positive; try circumin:

Try Circumin

Like caffeine, circumin can prevent plaque build up, and it removes plaque as well. This potent anti-inflammatory molecule makes up 5-10% of turmeric. It is known to lower cholesterol, reduce oxidative damage, and remove metals that accumulate in the brain like iron and copper. Check out *How To Optimize Curcumin Absorption* for more on circumin.

Supplement with Vitamin B3 and B1

UCI scientist Kim Green conducted a study on the effect that nicotinamide (vitamin B3) has on mice with Alzheimer's disease. This B Vitamin completely prevented the loss of cognition in the mice. Clinical trials are now being carried out using vitamin B3 as a treatment for Alzheimer's Disease.

Thiamine or vitamin B1 is also a promising treatment for Alzheimer's disease. Our brain uses up 20% of our energy, and in doing so, it uses enzymes that depend on thiamine for their function. When we don't have enough thiamine, it can lead to memory deficits and excessive plaque buildup. With enough thiamine, the cells in the brain can metabolize sugar effectively and function properly.

Cook with and Consume Coconut Oil

Coconut oil, especially the medium chain triglycerides found in coconut oil, provide an alternative fuel source for brain cells, which may prevent neuronal cell death. It has been found to help improve cognitive function in women with Alzheimer's, people without type 2 diabetes who had Alzheimer's, and people with severe cases of Alzheimer's. Coconut oil is also a great oil to cook with because it is not easily oxidized like polyunsaturated oils. Check out what else coconut oil can do for you.

Eat More Cruciferous Vegetables

Cruciferous vegetables contain sulforaphane, a compound that activates a transcription factor called Nrf2.What this means is that sulforaphane helps to set off a cascade of processes that detoxify and protect the body and brain from oxidative damage. sulforaphane works synergistically with circumin to reverse the aging of our cells due to oxidative damage.

The best source of sulforaphane is broccoli sprouts, and they can easily be sprouted at home in 7-9 days. If you don’t have access to broccoli sprouts, any cruciferous vegetables will do. Check out this salad recipe.

Increase Your Acetylcholine

Acetylcholine is the most used neurotransmitter in the brain and body. It is essential for muscle contraction, alertness, concentration, focus, and memory. Feeding your body with the components of acetylcholine and/or blocking the enzyme that breaks it down can be very effective for reducing the effects of brain aging and Alzheimer’s disease.

One of the primary components of acetylcholine is choline, and it is an essential nutrient that you must include in your diet. The best sources of choline are egg yolks, heavy cream, fatty fish, fatty meats, and liver. Make sure you source your meat, dairy, fish and eggs for people that treat their animals humanely and feed them what they are meant to eat. This will ensure that your animal products have a high amount of good quality fats and choline.

To ensure your brain gets the choline it needs, you can take a supplement like Alpha-GPC. This is a form of choline that can easily cross the blood-brain barrier. DMAE is another supplement that increases the level of acetylcholine in the brain while reducing beta amyloid plaque.

Other supplements like galantamine and huperzine-A increase acetylcholine in the brain by preventing the enzyme cholinesterase from breaking down acetylcholine.

What if Nothing is Helping?

Take the holistic approach, and improve your brain health by improving the health of your whole body. The gut and the brain are inexorably linked. Just like you can dimish cognitive function with poor health choices, you can improve brain function with a better diet. Research in brain regenration is making groundbreaking strides lately. Recently, many studies on mice have surfaced that use commonly used technologies, like ultrasound, to reverse Alzheimer's disease. In one study researchers used a "…focused therapeutic ultrasound, which non-invasively beams sound waves into the brain tissue." These sound waves activated the brain's microglial cells so that they could do their job of removing the beta amyloid plaque. The results were tremendous with 75% of the mice with Alzheimer's disease regaining their cognitive function. This means that this treatment may help reverse Alzheimer's disease by using the brain's own natural waste removal processes. This may be the miracle we have been searching for to treat Alzheimer's.

Related Reading:

- *The Alzheimer's Aluminum Connection – Organic Lifestyle Magazine*
- *Increase your IQ with the Right Foods, Herbs, Vitamins*
- *Mental Health, Physical Health & B Vitamins – Nature's Valium*
- *Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*

Related Products:

- Shillington's Brain Tonic

- Coconut Oil
- Vitamin B
- Beneficial Fats

Sources:

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- *Brain Tour* – Alz.org
- *Molecular mechanisms of neurodegeneration in Alzheimer's disease* – NCBI
- *Oxidative stress in brain aging, neurodegenerative and vascular diseases: An overview* – Science Direct
- *Macrophage Migration Inhibitory Factor is subjected to glucose modification and oxidation in Alzheimer's Disease* – Nature
- *Repeated Stress Causes Cognitive Impairment by Suppressing Glutamate Receptor Expression and Function in Prefrontal Cortex* – NCBI
- *Alcohol Use and the Risk of Developing Alzheimer's Disease* – NIH
- *Why neurons die: cell death in the nervous system.* – NCBI
- *Different kinds of physical activity shown to improve brain volume, cut Alzheimer's risk in half* – Science Daily
- *The Adaptive Brain: Aging and Neurocognitive Scaffolding* – Annual Reviews
- *Caffeine suppresses β-amyloid levels in plasma and brain of Alzheimer's transgenic mice* – NCBI
- *The effect of curcumin (turmeric) on Alzheimer's disease: An overview* – NCBI
- *Vitamin B1 (thiamine) and dementia.* – NCBI
- *Vitamin B3 reduces Alzheimer's symptoms, lesions* – UCI News
- [*COCONUT OIL: NON-ALTERNATIVE DRUG TREATMENT AGAINST ALZHEIMER´S DISEASE].* – Europe PMC
- *The Nrf2/ARE Pathway as a Potential Therapeutic Target*

in Neurodegenerative Disease – NCBI
- *How to Improve Memory with Acetylcholine* – University Health News
- *Galantamine—a novel cholinergic drug with a unique dual mode of action for the treatment of patients with Alzheimer's disease.* – NCBI
- *Toxic air pollution particles found in human brains* – The Guardian
- *New Alzheimer's Treatment Fully Restores Memory Function* – Science Alert