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## **Foods That Prevent Inflammation Also Enhance Your Brain Function**

By Dr. Mercola | November 15<sup>th</sup>, 2017

It is important to realize that chronic inflammation often leads to chronic illnesses and health conditions, including obesity, heart disease, Type 2 diabetes, cancer and immune-mediated conditions. In fact, inflammation plays a significant role in seven of the top 10 leading causes of death.

Inflammation is a normal part of your body's response to the environment to protect you from foreign invaders, such as bacteria, viruses and fungi. However, chronic, long-term inflammation increases your risks for devastating health conditions that may change the way you live or may even lead to death.

Many times, inflammation starts in your gut. Your intestines are a large and complex organ designed to pass nutrients to your body and gather waste to pass from your body. What you eat has a considerable effect on the permeability of your intestinal walls and how much waste or toxins may leak into your body. This leakage is a substantial driving force in the development of chronic inflammation.

The degree of permeability is in direct proportion to chemical mediators inside your intestines and in your bloodstream, in real time. This means that you can affect permeability immediately with the choices you make. However, repeated damage reduces the ability of the intestines to respond properly.

Eventually this may lead to impaired absorption of nutrients and overburden your immune system. Inflammation also has an effect on your brain. Recent research has found those with inflammatory markers in their 50s experienced a reduction in the size of their brain 24 years later.

### **Inflammation May Lead to Reduced Brain Volume**

This study provides more evidence that systemic inflammation may have lifelong effects on your health. The researchers took blood samples from a large, biracial community and analyzed five inflammatory markers at the start of the study and then again 24 years later. Those markers included levels of fibrinogen, albumin, white cell count, factor VIII and von Willebrand factor.

Using these levels, the researchers created a composite score they could compare against other participant scores and MRI images taken at the conclusion of the study. The participants were divided into three groups based on the level of their inflammatory markers. When the group with three or more elevated biomarkers was compared against the group without any elevations, they found the group with higher inflammation experienced a 5 percent reduction in brain volume.

Brain areas with reduced volume were in the hippocampus and other areas associated with the development of Alzheimer's disease. Those with higher levels of inflammation also performed poorer on a memory test given to the participants.

Lead study author Keenan Walker, Ph.D., from Johns Hopkins University School of Medicine said the effect of one standard deviation increase in inflammation, appeared to correlate to having a copy of the gene that increases the risk

of developing Alzheimer's disease and was associated with a decrease in size of 110 cubic millimeters of the hippocampus.

Although the results from this study support evidence from others that inflammation negatively affects brain volume and cognitive performance, the authors acknowledge this study used inflammatory markers from only one point in a 24-year timespan.

There are several factors that affect the degree of inflammation you may experience in your body and brain. When you address these factors, you may be able to reduce the long-term effects of inflammation, including cognitive decline, cancer, immune-mediated disease, Type 2 diabetes and numerous other health conditions.

### **Sleep Clears Your Mind and Detoxifies Your Brain**

Achieving quality sleep may be one of the most important factors in developing optimal health. A lack of sleep can have many ramifications, ranging from short-term to lifelong. Research has found sleep loss for just one night may increase the inflammatory response in your body, and a good night's sleep can reduce your risk of heart disease and autoimmune disorders.

Subclinical shifts in basal inflammatory cytokines have also been noted in those whose sleep was restricted between 25 and 50 percent of normal. The mechanism explaining the alteration in inflammation is not known, but the researchers theorize it's likely related to metabolic changes. In a recent meta-analysis of 72 studies involving more than 50,000 participants, the data demonstrated that both too much and interrupted sleep had the effect of increasing the inflammatory response.

Dr. John Krystal, editor of *Biological Psychiatry*, commented on the meta-analysis, stating, "It is important to highlight that both too much and too little sleep appears to be associated with inflammation, a process that contributes to depression as well as many medical illnesses."

Adequate amount of quality sleep not only reduces inflammation, but also helps clear your brain of toxins and metabolic waste products. Sleep is critical to keep your brain's unique waste management system fully functional. Researchers from the University of Rochester Medical Center found this system is activated during sleep when your brain cells shrink nearly 60 percent, making waste removal easier.

For example, during sleep your brain removes amyloid-beta in greater amounts than when you're awake. These are the proteins that form in the brains of people suffering from Alzheimer's disease.

### **Too Much or Too Little May Increase Inflammation**

Your body works optimally in moderation. In other words, too much or too little sleep and you'll increase your inflammatory markers. The same is true for exercise. You may think of this as a Goldilocks effect — in other words, not too much and not too little will allow you to reap the greatest benefit.

Consistent overexertion at any exercise can lead to chronic inflammation. The aftereffect of overexertion may also lead to overuse injuries or illness. Fatigue, dehydration and other injuries may follow a single intense workout, while chronic secretion of cortisol from overexertion may also negatively impact your immune system and lead to colds and other illnesses.

Cortisol is released during a physical or psychological stressor. It has different functions throughout your body, such as regulating blood sugar, reducing inflammation and assisting in memory formation. Researchers have found that prolonged stress may alter the effectiveness of cortisol by reducing your cells sensitivity to cortisol and increasing the inflammatory response. Lead author, Sheldon Cohen, Ph.D., Carnegie Mellon University, commented on the link between stress and the immune system, saying:

*"The immune system's ability to regulate inflammation predicts who will develop a cold, but more importantly it provides an explanation of how stress can promote disease.*

*When under stress, cells of the immune system are unable to respond to hormonal control, and consequently, produce levels of inflammation that promote disease. Because inflammation plays a role in many diseases such as cardiovascular, asthma and autoimmune disorders, this model suggests why stress impacts them as well."*

Often the greater risk lies in a sedentary lifestyle. Sedentary behavior has influenced inflammatory markers in participants, independent of obesity, single workout during the day or blood sugar levels. Sitting during the day has been associated with a 66 percent higher risk of certain cancers, including endometrial cancer, colon cancer and lung cancer.

### **Inflammatory Response to Food**

The foods you eat may have a major effect on the inflammation in your body. The National Institute of Allergies and Infectious Diseases wrote about the common Western diet and the relationship to inflammation:

*"While today's modern diet may provide beneficial protection from micro- and macronutrient deficiencies, our over-abundance of calories and the macronutrients that compose our diet may all lead to increased inflammation, reduced control of infection, increased rates of cancer, and increased risk for allergic and auto-inflammatory disease."*

Foods that increase the inflammatory response in your body include: Sugar, high fructose corn syrup, artificial trans fats, processed vegetable and seed oils, refined carbohydrates, excessive alcohol, processed meats, oxidized omega-6 fats.

### **The Nitric Oxide Dump**

In this video, I demonstrate a simple exercise called the Nitric Oxide Dump that has several benefits. This three-minute exercise, done three times a day, will stimulate the release of nitric oxide to support your immune system, lower your blood pressure and decrease platelet aggregation. Nitric oxide also helps you to develop more lean body mass.

Since it's a short exercise you do several times per day, it reduces the potential for overexertion and helps you keep moving throughout the day. You'll want to wait at least two hours between each session. The exercise doesn't require any equipment and can be done anywhere you happen to find yourself. A combination of exercise with dietary restriction may increase your benefits and mobilize adaptive cellular stress-response pathways that involve DNA repair, mitochondrial biogenesis and anti-inflammatory cytokines.

### **Anti-Inflammatory Foods Help Reduce Inflammation Markers**

Just as some foods may increase the inflammatory response in your body, others have an anti-inflammatory effect. According to Harvard Medical School, one of the most powerful tools to fight inflammation does not come from a pharmacy, but rather from your grocery store. Some of the top anti-inflammatory foods include: Garlic, strawberries, blueberries, cherries, almonds, walnuts, olive oil, spinach, kale, salmon, mackerel, sardines, cloves, ginger, rosemary, turmeric.

Keep in mind that while fish is traditionally recognized as a primary source of healthy omega-3 fats that help reduce inflammation, eating seafood from contaminated waters offsets any benefits. You risk polluting your body and damaging your health with chemicals and heavy metals the fish have absorbed from their environment.

Unfortunately, a large majority of wild-caught fish are too contaminated with mercury, heavy metal and chemicals

and farm-raised fish carry their own list of risks from pharmaceutical treatment, overcrowding and unsafe contaminants.

As a general rule, I recommend eating only authentic wild-caught Alaskan salmon or smaller fatty fish with short life cycles, such as sardines, herring, mackerel or anchovies. These are good choices to get omega-3 fats while avoiding as many toxins as possible.

Although not a specific food, eating a diet high in healthy fats and low net carbohydrates and moderate amounts of high-quality protein has also demonstrated a significant effect at lowering your inflammatory response. Also called a ketogenic diet, recent research from the University of California San Francisco uncovered a potential mechanism that helps explain why the ketogenic diet so effective in reducing inflammation in the brain.

In short, this mechanism explains how alterations in glucose metabolism influence inflammatory responses in your cells. I would recommend you consider implementing a ketogenic diet in your nutritional plan.