

# **Gut-Brain Connection in Mental Health**

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It has long been believed that depression is due to a decrease in serotonin or a “chemical imbalance” and treated with antidepressants such as Prozac. However, it has been found that often times antidepressant medication responses are due to a placebo effect, simply do not work, or can make the existing condition worse due to side effects and difficulties with harsh physical withdrawal symptoms. Furthermore, depression has been found in patients with high serotonin as well as low levels. Thus, it has caused us to rethink this hypothesis and to consider other causes, and likewise, safer treatments than medications.

## ***What is the Microbiome?***

Researchers are finding that depression and other behavioral problems appear to be linked to an imbalance in the gut. It is amazing to learn that only 10% of the cells in our body are actually human!! We share our life with about 100 trillion organisms which comprise our Microbiome. It is made up of good and bad bacteria, fungi and viruses, called microbiota, that help us to perform life-sustaining functions. They inhabit everything from our skin and genitals to our intestines. These clusters of microbiota in the gut are known as the “gut flora.”

What we have come to understand is that the makeup and overall health of your Microbiome as a whole determines whether pathogens (bad bacteria) in the gut can coexist peacefully, or cause disease.

Our gut flora is fundamental to the breakdown and absorption of nutrients. Without it, the majority of our food would not only be indigestible, but we would not be capable of extracting the critical nutritional compounds (vitamins and minerals) needed to function.

## ***Where Does the Microbiome Come From?***

It begins at birth. We come into this world with a blank slate. Our first exposure is via the birth canal, followed by a gut nurturing inoculation of mother’s milk. This sets the foundation on which we build our Microbiome. Throughout our formative years, we are continually exposed to various organisms, and through diet, our environment and human contacts, the Microbiome forms. The health of the Microbiome, then determines our health for a lifetime.

Our gut flora connects to virtually every process in our body. Thus, imbalances in our gut flora have been implicated in multiple health issues, including immune

health, depression and other psychiatric disorders, and some of our deepest chronic health issues.

### ***The Gut is Closely Linked to the Brain***

We have two nervous systems – the *central nervous system*, which is made up of our brain and spinal cord, and the *enteric nervous system*, which comprises the nerve tissue in the gut. This is sometimes referred to as the “second brain.” As an embryo, this nervous tissue begins as one, and through development, splits into the central nervous system (brain) and the enteric (gut) nervous system. These two nervous systems are connected through the vagus nerve, which travels from the brain to the abdomen, and sends feedback information to the brain, from the gut, and back again in a bi-directional loop. This nerve connects the two brains together, and has a profound influence on our mental health.

It is interesting to note that approximately 95% of our serotonin is made in the gut. Likewise, 10% of information is transmitted from brain to gut; whereas 90% of information flows from gut to brain.

### ***Inflammation and the Gut***

About 80% of our immune system is located in our gut. It plays a vital role in keeping us healthy and warding off disease. We need to have a balance of good and bad bacteria in the gut to be healthy. The organisms that make up the immune system determine friendly bacteria from bad bacteria. The gut is the starting point for inflammation, where chemicals are produced to protect us from “foreign invaders” of bacteria and viruses. When the lining of the gut is continually damaged by these foreign invaders, inflammatory signals emerge, and travel to the brain through the vagus nerve, and subsequently can cause depression, anxiety and other mental health conditions.

In addition, chronic inflammation of the gut can lead to a breakdown of the integrity of the lining of the gut, leading to abnormal bacteria and inflammatory messengers that move from the gut into the lymph nodes, and travel to not only the brain, but to other organs of the body as well. This is known as a “leaky gut” syndrome. There is evidence to support that this process has been implicated in many disease states such as rheumatoid arthritis and other autoimmune diseases, diabetes type 2, asthma, Parkinson’s disease, Alzheimer’s disease, autism, as well as psychiatric conditions of depression, anxiety and bipolar disorder.

### ***Micronutrients and Chronic Inflammation***

Micronutrients are vitamins and minerals required in small amounts that are essential and vital to the proper functioning of all the body’s systems. Deficiencies can alter the gut flora creating an increased inflammatory response. Chronic

inflammation damages healthy structures such as the heart and lungs, but also can directly cause inflammation of the brain and its underlying structures.

### ***Gut Bacteria Are Affected By Diet, Lifestyle and Micronutrients***

In addition to a lack of vitally important micronutrients, lifestyle and dietary factors contribute to an imbalanced gut flora.

Refined sugar, especially high fructose corn syrup, conventionally-raised meats and other animal products, NSAIDS (Motrin), chlorinated and/or fluorinated water, genetically engineered foods and processed foods, gluten, proton pump inhibitors (Prilosec), chronic emotional stress, agricultural chemicals such as herbicides and pesticides and glyphosate, and antibiotics all contribute to a detrimental inflammatory process.

### ***How To Heal Your Gut Flora***

Replenishing the gut with healthy bacteria is important for the prevention of both physical and psychiatric diseases. It begins with eliminating all of the above assaults, and eating a healthy Paleo diet, then giving healthy, beneficial bacteria.

It is important to radically reduce sugar intake and begin eating fermented foods such as sauerkraut, fermented vegetables, fermented milk such as kefir, lassi, and natto (fermented soy). In addition, taking a high quality probiotic is essential to replenish good bacteria and maintain a healthy gut flora.

If there is an overgrowth of yeast or candida, starting an antifungal program for several months will be required. Anti-fungals include: olive leaf extract, oil of oregano, kyolic garlic and caprylic acid.

Most importantly, a broad spectrum micronutrient supplement of vitamins, minerals and amino acids has been shown to prevent and treat chronic diseases, including psychiatric disorders such as depression. Micronutrients directly intervene with the immune system and have been shown to heal inflammation.

### ***Nutrient Treatments in Mental Health***

A healed and healthy functioning gut is paramount to healing and preventing chronic disease. However, it is only the first step in the healing process. Nutrient absorption is dependent upon a healthy gut flora. Research is now pointing towards a “nutrient deficient” cause of psychiatric disorders such as depression, anxiety and bipolar disorder. Many people are successfully healing from these imbalances as a result of nutrient therapies and a healthy gut flora. In essence, when you give the body what it needs, it can heal.

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