

# The Gut-brain Connection: Research meets clinical care in Integrative Mental Health

*Research Analysis by Craig Wagner*



Laced throughout our bodies are over 100 trillion uninvited guests.

Congregating in our gut, these bacteria, fungi, and microscopic protozoa are collectively called the microbiome.

Although they are parasites that seek their own survival, research is showing that they have a life-sustaining symbiotic relationship with their human hosts. Keeping our microbiome healthy, helps keep us healthy.

Our microbiome works continually on our behalf. It helps digest our food, influences inflammation in our tissue, protects our intestinal lining, releases neurotransmitters, tweaks our [immune system](#), and impacts hormonal secretion. It even carries on a two-way conversation with our brain that seems to have an important impact on mental health.

How can bacteria swimming in our gut have so much influence?

They have help from an important intermediary: the enteric nervous system (ENS). Also called the "brain in our gut", the ENS is composed of two thin layers of millions of nerve cells that line the nine-meters of our gastrointestinal tract from our esophagus to our rectum. This second brain can't do math problems but manages our digestion and influences our immune and endocrine systems. It also connects to the brain through the vagal nerve.

This bi-directional pathway from our microbiome, through our ENS, to our brain, is called the microbiota-gut-brain axis, and is considered vital for mental health.

Let's consider the research.

### **The Research.**

Although in its infancy, microbiome research is creating a stir, since gut health influences many bodily systems. It is the gut-brain connection, however, that intrigues mental health researchers.

Let's start the research review in Hamilton, Ontario.

Here, microbiologist Premysl Bercik and gastroenterologist Stephen Collins led a McMaster University team that examined the microbiome of mice. They took gut bacteria samples from normal mice and placed them into the microbe-free intestines of other mice. The [results](#) were startling: the recipient mice took on aspects of the donor's personality. Naturally timid mice became more exploratory. More daring mice became shy.

The McMaster team then took a [step further](#). They implanted intestinal matter from people with Irritable Bowel Syndrome (IBS) into microbe-free mice. The mice developed IBS symptoms, including the anxious behavior of their human donors.

Gut flora seemed to be a trans-species causative agent for anxious behavior.

Meanwhile, human research was uncovering correlations between gut flora and mental health symptoms. [Researchers](#) were able to determine with 97% accuracy whether someone was depressed or not simply by looking at the microbial genomes from fecal swabs. People with PTSD were identifiable with a [high degree of accuracy](#) by decreased amounts of certain bacteria in their gut. And the oral flora of people with schizophrenia was [found to be significantly different](#) from a population without psychosis. The microbiome seemed to carry definite markers of mental health symptoms.

But what of causality? Can we isolate parts of the microbiome that promote mental wellness? Can we intelligently alter the microbiome to improve mental health? In some cases, the research says, yes.

This answer emerged as researchers began looking at patterns of gut flora in both healthy and unhealthy people. Healthy people had a greater diversity of organisms with a greater abundance of cells. They also had larger populations of specific species of microorganisms. Researchers hypothesized that inoculating unhealthy individuals with these specific species – especially Lactobacillus and Bifidobacteria - might result in improved mental health.

And in many cases, it did.

Healthy volunteers given Lactobacillus for 30 days [had lower stress](#) levels than those who received placebo. People who consumed probiotic-containing yogurt for 3 weeks had [significantly improved mood](#) compared to controls. Volunteers who received multispecies probiotics for 4 weeks exhibited a [reduction in ruminating and aggressive thoughts](#). People with IBS given prebiotics (substances upon which probiotics feed) and other microorganisms experienced a [reduction in anxiety](#).

And perhaps most surprising, one long-term [study](#) tracked individuals who were given probiotics during the first six-months of their life. After 13 years, none of those receiving probiotics exhibited ADHD or autism symptoms, while 17% of the control group did.

### **Implications for clinical care.**

Although research is still immature, clinical practice is changing. These changes are seen in the growing adoption of Integrative Mental Health, a discipline that combines the best of conventional psychiatric pharmacology with insights from Functional Medicine, human wellness, and several evidence-based complementary modalities. Specific clinical interventions include:

- *Help patients eat well.* This is getting back to basics. A “Mediterranean diet” rich in vegetables, fruit, legumes, whole grains, lean meats, low-mercury fish, heart-healthy fats and oils, with minimal animal fats and sweets is considered an [excellent mental health diet](#). This diet can help [improve depression](#), and countries where this diet predominates, have a [lower incidence of schizophrenia](#). Healthy foods are the raw materials on which the microbiome feeds. It also provides a foundation for both physical and mental health. Although changing the diet is easy in concept, it is difficult in practice. Dietitians agree that the key is to help patients make incremental sustainable changes to their eating habits.
- *Take a page out of the book of Functional Medicine.* A robust [biomedical test panel for mental health](#) can help identify nutrient and micronutrient deficiencies, food allergies, inflammation irregularities, parasitic infections and heavy-metal toxicity – all of which influence our gut, our microbiome, and our mental health. Although testing costs must be controlled, an investment here could pay huge dividends when it identifies treatable issues early, so that interventions can be targeted at root causes. Clinical results from practitioners who use [Walsh Research Institute](#) functional medicine protocols are delivering [impressive mental health improvements](#) across a wide range of mental health diagnoses.
- *Consider probiotics and prebiotics.* Research to date suggests that probiotics can improve a variety of mental health symptoms. Although these studies are not conclusive, probiotics and prebiotics are relatively inexpensive, and their side effects are usually mild or non-existent. This weighs in favor of experimenting with them as one possible intervention for those in mental distress.
- *Look for gut malabsorption.* By analyzing the world's largest database of blood samples of people with mental health diagnoses, [researchers assert](#) that 10% of people with a mental health diagnoses and up to 90% of autistic individuals may have gut malabsorption issues.

This may result in inadequate nutrient absorption and the movement of toxins from the gut into the blood stream through a compromised intestinal barrier. When malabsorption is suspected, treatment may involve the adjustment of stomach acid levels, adding digestive enzymes and antioxidants, as well as changes in diet.

### **Looking forward.**

The gut-brain connection remains extraordinarily complex, and considerable new research is needed. Three threads seem especially promising.

*Understand and address bio-individuality.* Although one-size-fits-all probiotics have been shown to help people with a variety of symptoms, they are not a universal cure-all for mental health issues. There are simply too many causative factors at play. Greater benefits will likely be found as we understand each person's unique body chemistry and microbiome, and determine how to best address these unique characteristics with more customized interventions.

*Explore psychobiotics.* Interest is growing in research based on the observation that our gut flora interacts with and activates the same bodily systems as pharmaceutical antidepressants. This is leading to the possibility of developing a new class of interventions called psychobiotics – specific combinations of gut flora that have known psychoactive properties. Advances here could lead to using naturally-occurring bacteria and fungus as medicine.

*Think evolution.* Dr. Emily Deans, M.D., psychiatrist and instructor at Harvard Medical School, points us in a new direction: evolutionary psychiatry. She notes that our [microbiome has evolved](#) with us and has changed dramatically since our ancestors were hunter-gatherers. The 20th century has seen many health advances with huge reductions in parasitic infections. What is unclear is the degree to which we have lost symbiotic benefits from the parasites we worked so hard to eradicate.

Today's drug-centric model for psychiatric care is far from ideal: the meds have limited effectiveness and many side effects, both short- and long-term.

But there is good news. The research along the microbiota-gut-brain axis is showing promise and may be a means to develop non-pharmacological interventions for the millions of people living in mental distress. In fact, some researchers are calling this gut-brain connection the [epicenter of a new approach to mental health](#).