

# OPTIMAL HEALTH UNIVERSITY™

Presented by Dr. Wayne Terai

## The Gut-Brain Axis

*Doctors of chiropractic have long recognized the importance of gut flora — the naturally occurring bacteria in the intestines — to overall health. Indeed, the 1,000 trillion “good” digestive system bacteria are critical in helping the body absorb nutrients from food, as well as bolstering immunity.*

*But did you know that those friendly microorganisms may also be responsible in part for mental well-being? A new study supports the increasingly popular notion that an imbalance of gut flora could play a role in depression, anxiety, and even developmental disorders like autism. Dr. Terai explains the latest research into the “gut-brain axis” and outlines steps you can take to keep both healthy.*

### All About Gut Flora

As many as 1,000 species of microorganisms — mostly bacteria — live in your gastrointestinal (GI) tract, or “gut.” Often referred to as “gut flora” or “gut microflora,” these microorganisms live in a symbiotic — or mutually beneficial — relationship with their hosts. In exchange for a home and food source, gut flora performs several functions that support health.

The beneficial flora in the digestive tract provides enzymes that break down certain carbohydrates. Specific bacteria ferment these carbohydrates, transforming them into acids that the body uses for fuel. The fermentation process also helps the body absorb nutrients from food, as well as synthesize vital nutrients like biotin and folate.

Researchers are still learning about the intricate ways gut flora works to protect us from disease. Gut flora supports the body’s immune system by inducing it to produce antibodies. They also work directly against pathogens, crowding them out of the gut. Finally, our gut flora metabolizes some cancer-causing toxins in food, rendering them harmless to our bodies (*EMBO reports* 2006;7:688-93).

You may become uncomfortably aware of the importance of gut flora if it becomes unbalanced — for example, when you take an antibiotic. You may experience diarrhea as your body struggles to digest food normally while potentially fighting pathogenic overgrowth of microorganisms.

### Fascinating New Findings

Dr. Terai wants patients to know about fascinating new research linking gut flora with mental health.

Scientists at the Farncombe Family Digestive Health Research Institute, one of the world’s top research institu-

tions for gastrointestinal health, started with a group of healthy adult mice. They gave the mice antibiotic drugs to disturb their normal gut flora. Antibiotics kill off some of the health-promoting bacteria in the gut, allowing other, more destructive bacteria, to flourish.

With this alteration of intestinal flora, the mice had an increase in brain-derived neurotrophic factor (BDNF), a protein required for the development and function of brain cells. This change in BDNF is associated with depression and anxiety, symptoms the mice displayed. When investigators stopped administering antibiotics, the mice’s gut flora and behavior reverted to normal.

To further analyze the connection between gut flora and behavioral changes, the scientists colonized the guts of mice with bacteria taken from other mice with different patterns of behavior. Usually passive mice became more active and daring when they received bacteria from bolder mice. At the same time, naturally active mice were subdued by gut flora taken from more passive mice.



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This research not only sheds new light on the power of gut flora to affect mood and behavior, but it also supports the potential of probiotic therapy in addressing mental disorders (*Gastroenterology* 2011;Epub).

### The Gut-Brain Axis

The concept of a *gut-brain axis* highlights a close relationship between the health of the GI tract and the health of the mind. Mounting evidence shows that anxiety and depression commonly occur alongside gastrointestinal disorders. Chronic inflammation of the gut affects not only anxiety-like behavior but also brain chemistry. When the inflammation is treated, behavior and neurochemical levels — alongside gut flora levels — return to normal (*Gastroenterol* 2010;139:2102).

Surveys of human patients give even more credence to the gut-brain axis. Of patients with inflammatory bowel disease (IBD), 30 percent experience psychiatric complications while IBD symptoms are in remissions, and up to 80 percent do so during flare-ups (*Psychosom Med* 2004;66:79-84).

Individuals with Crohn's disease, a chronic inflammatory disorder of the GI tract, are more likely than others to be diagnosed with a psychiatric condition (*Dig Dis* 2008;26:156-66).

Gut health may even play a role in developmental brain disorders such as autism. Comparisons of the microorganisms in stools from neurotypical children and children diagnosed with late onset autism show a consistently wider variety of certain kinds of bacteria in the guts of children with autism (*Clin Infect Dis* 2002;35:S6-S16).

On the other hand, the gut-brain axis can work in the opposite direction. As anyone who has experienced an upset stomach during a stressful situation knows, your mental state can affect how your gut feels. This is because stress causes changes in gut flora, with results ranging from stomach

pain and diarrhea to chronic GI disorders (*Gastroenterol* 2009;136:2003-14).

Studies on rat pups separated from their mothers reveal changes in their fecal bacteria, showing the powerful influence of stress on the gut-brain axis (*Biological Psychiatry* 2009;65:263-7).

### Caring for Your Gut Flora

Fortunately, you can take steps to improve and protect your GI health by supporting a normal, healthy balance of gut flora. Gut health is one of many reasons this chiropractic office recommends avoiding unnecessary use of antibiotic drugs. These potent medications kill both the “bad” bacteria they are prescribed to target and the “good” bacteria that keep your body healthy. This is why many people find that antibiotics upset their stomachs.

A balanced diet based on whole foods also promotes healthy gut flora. Choose a variety of vegetables, legumes, proteins, healthy fats and some whole grains. Limit sugars and refined carbohydrates. Some research suggests that restricting all carbohydrates is effective in treating chronic condi-

tions related to gut flora. Probiotic foods that further support gut health include cultured dairy like yogurt and kefir as well as naturally fermented pickles and relishes.

Finally, regular chiropractic care can ease GI symptoms (*Clinical Chiropractic* 2009;12:28-34).

By addressing misalignments in the spine called **vertebral subluxations**, the doctor helps patients find relief from a surprisingly wide variety of disorders, many of which are connected to the nervous system.

If you're concerned about your gut health, call our office today for a consultation. We focus on providing personalized advice on nutrition, stress management, and several other aspects of wellness.

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