



Healthy Aging

Healthy Body The Brain-Gut Connection

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Anxiety and depression have been thought to contribute to gastro conditions like irritable bowel syndrome (IBS). A Johns Hopkins expert explains how what's going on in your gut could be affecting your brain.

If you've ever "gone with your gut" to make a decision or felt "butterflies in your stomach" when nervous, you're likely getting signals from an unexpected source: your *second* brain. Hidden in the walls of the digestive system, this "brain in your gut" is revolutionizing medicine's understanding of the links between digestion, mood, health and even the way you think.

Scientists call this little brain the *enteric nervous system* (ENS). And it's not so little. The ENS is two thin layers of more than 100 million nerve cells lining your gastrointestinal tract from esophagus to rectum.

What Does Your Gut's Brain Control?

Unlike the big brain in your skull, the ENS can't balance your checkbook or compose a love note. "Its main role is controlling digestion, from swallowing to the release of enzymes that break down food to the control of blood flow that helps with nutrient absorption to elimination," explains [Jay Pasricha, M.D.](#), director of the Johns Hopkins Center for Neurogastroenterology, whose research on the enteric nervous system has garnered international attention.

"The enteric nervous system doesn't seem capable of thought as we know it, but it communicates back and forth with our big brain—with profound results."

The ENS may trigger big emotional shifts experienced by people coping with irritable bowel syndrome (IBS) and functional bowel problems such as constipation, diarrhea, bloating, pain and stomach upset. "For decades, researchers and doctors thought that anxiety and depression contributed to these problems. But our studies and others show that it may also be the other way around," Pasricha says. Researchers are finding evidence that irritation in the gastrointestinal system may send signals to the central nervous system (CNS) that trigger mood changes.

"These new findings may explain why a higher-than-normal percentage of people with IBS and functional bowel problems develop depression and anxiety," Pasricha says. "That's important, because up to 30 to 40 percent of the population has functional bowel problems at some point."

New Gut Understanding Equals New Treatment Opportunities

This new understanding of the ENS-CNS connection helps explain the effectiveness of IBS and bowel-disorder treatments such as antidepressants and mind-body therapies like cognitive behavioral therapy (CBT) and medical hypnotherapy. "Our two brains 'talk' to each other, so therapies that help one may help the other," Pasricha says. "In a way, gastroenterologists (doctors who specialize in digestive conditions) are like counselors looking for ways to soothe the second brain."

Gastroenterologists may prescribe certain antidepressants for IBS, for example—not because they think the problem is all in a patient's head, but because these medications calm symptoms in some cases by acting on nerve cells in the gut, Pasricha explains. "Psychological interventions like CBT may also help to "improve communications" between the big brain and the brain in our gut," he says.

Still More to Learn About Mind-Gut Link

Pasricha says research suggests that digestive-system activity may affect cognition (thinking skills and memory), too. "This is an area that needs more research, something we hope to do here at Johns Hopkins," he says.

Another area of interest: Discovering how signals from the digestive system affect metabolism, raising or reducing risk for health conditions like type 2 diabetes. "This involves interactions between nerve signals, gut hormones and microbiota—the bacteria that live in the digestive system," Pasricha says.

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WHAT THE EXPERTS DO

+ Can Food Affect Your Mood?

Although there is a lot of folklore around this subject (particularly with spices such as pepper and curcumin or teas), there is really not enough rigorous science to make practical recommendations. A basic healthy diet is really important. Beyond that, listen to your gut. Your nervous system and gut may be wired to react to certain foods, and you may feel better if you avoid them. If you've ever come back after lunch and felt tired, nauseous, or a little "fuzzy," your enteric nervous system may be reacting to something you ate—and sending signals to your brain.

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