Is Your Gut Making You Depressed or Anxious?

Turns out “gut feeling” is more than just a fancy name for intuition. Our small and large intestine, and the trillions of bacteria that call it home, are more important than ever imagined for influencing our mood, our anxiety, our choices, and even our personalities. This week Savvy Psychologist Dr. Ellen Hendriksen goes straight for the gut with three surprising mind-gut connections.

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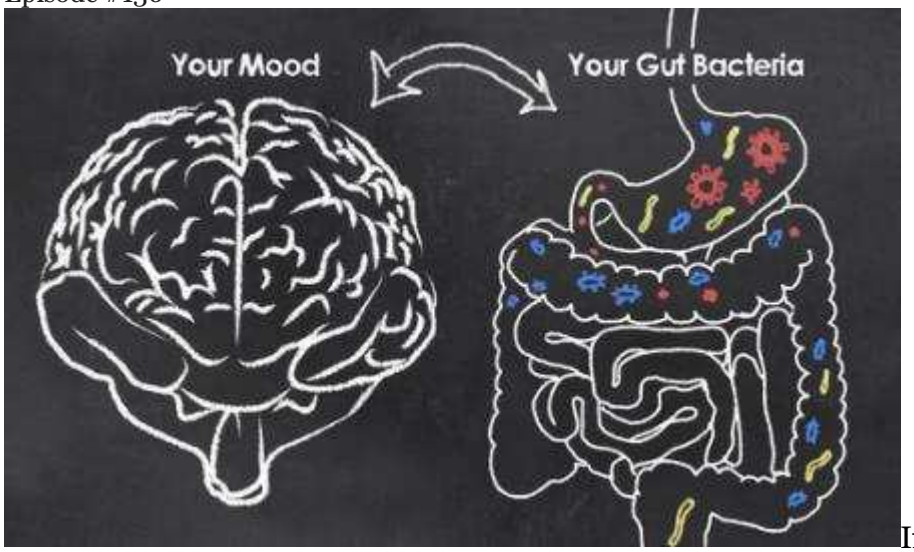
December 23, 2016

Episode #136



If you had to guess the organ that has undue influence on your emotions, your mood, even your choices, what would you guess? The brain? Sure, but what else? The heart—that mythological seat of the soul? Not quite. The stomach? You’re getting warmer. Would you believe it’s the large and small intestine, collectively known as the gut? More specifically, it’s the trillions of bacteria—the microbiota—that live in your gut. Each of us carries up to four and a half pounds of bacteria around in our guts at any given time. More than 100 trillion microbes live down there. That’s as many cells as make up the rest of your body.

Now, this crowd is mostly good guys, and they do important work, to the extent that some scientists advocate classifying these collective microbiota as its own organ. Aside from helping digest our food, they protect us from disease, neutralize some of the toxic by-products of the digestive process, and make it harder for bad bacteria to set up shop. In short, your gut does way more than just digest everything from Cheetos to camembert.

But it turns out gut bacteria may also affect how we feel. Who knew the next frontier in mental well-being would lead right to the toilet? With that lovely image in mind, here are 3 big ways our microbiota are connected to our mental health.

Connection #1: Your gut-mind relationship goes two ways. We already know that feeling anxious affects our guts. Anxiety make us run to the bathroom, makes us queasy, and generally makes our guts feel like stressed-out Boy Scouts were practicing for their knot-tying merit badge in there. Likewise, when you're depressed, everything stops in its tracks, resulting in constipation. But while it's intuitive that anxiety and depression affect the gut, turns out the gut may also affect anxiety and depression.

A research group at University College Cork in Ireland fed *Lactobacillus rhamnosus*, a probiotic common in yogurt, to one group of mice. To another group, they fed the equivalent amount of a sterile, bacteria-free broth. Then the mice were put through the equivalent of Mouse Boot Camp. When forced to swim in deep water, the probiotic-fed mice persevered. But the broth-fed mice gave up without a struggle, indicating the mouse version of depression. Likewise, when placed in an unfamiliar elevated maze, the probiotic-fed mice ventured out into the open more often than the broth-fed mice. They hung back, a proxy for mouse anxiety. Indeed, the probiotic-fed mice were more chillaxed in every way—that is, until everybody's vagus nerves were cut, thus severing the most important communication pathway between the brain and the guts. After that, the differences between the two groups vanished.

OK, you say, but we are not mice. We don't have mouse guts or mouse brains. True, but in another study, this time out of UCLA, a group of healthy women ate probiotic-fortified yogurt twice a day for four weeks. A second group ate a non-probiotic milk product, and a third group ate their regular diet. After the four weeks, everyone went in the brain scanner to measure their brain's response. The probiotic group showed significantly different brain functioning, both at rest and in response to a task of emotion recognition.

The take home? There's still a long way to go, but someday, perhaps the way to unwind may not be with a bottle of beer, but with a container of your favorite yogurt.

Connection #2: Your gut may affect your personality. In another mind-blowing (or should I say gut-blowing?) study, a group at McMaster University used two groups of experimental mice, each bred for certain behavioral characteristics. One strain was more timid and shy—you might even say they were introverts. The other was more sociable and bold—you might call them the extroverts. But not for long. The researchers wiped out all the gut bacteria of both strains of mice with antibiotics, then fed each group with the gut bacteria of the opposite mouse strain. What happened? Behaviorally, they swapped personalities. The shy mice became outgoing, the outgoing mice became shy.

Unlike the yogurt study, we're probably not going to try repeating this one in humans anytime soon. But the trend is clear: our guts play a role in our emotions and perhaps even our behaviors. Which brings us to...

Connection #3: The gut may drive our food choices. If you've ever felt propelled to the fridge by a force other than your own, you may not be that far off. There's a theory that your cravings may actually be caused by your gut bacteria. Apparently there's a crowd of trillions in there that really likes chocolate cupcakes, bacon, cheese, or whatever it is your specific bacteria run on.

The theory goes like this: when we eat the foods our bacteria want, they produce particles that are small enough to cross the blood-brain barrier, like tyrosine or tryptophan, which, as luck would have it, get converted into dopamine and serotonin in the brain, both of which impact mood and reinforce those food choices.

If you've ever been besieged by cravings, not to mention grumpiness, after a few days on a diet, it may be because your gut bacteria are starving for their preferred sources of fuel. It makes sense: millions of years of evolving together have probably paired humans up with bacteria that can manipulate us. Feel like a giant robot controlled by tiny masterminds yet?

To make you feel even more like an automaton forced to do your gut's bidding, gut bacteria are also thought to help control our feelings of satiety. In sum, bacteria may decide, at least in part, both what and how much we eat.

Keep in mind that this is a theory—a well-informed theory, but untested nonetheless. But it might explain why, when we change our diets, we have strong cravings for a while, but then all turns quiet on the gut front. Is this because sugar-loving bacteria starved and ended up in the toilet? We don't know, but researchers are trying to find out.

What *do* we know about how we can influence the gut-mind connection?

That's all fine—and a little freaky—you say, but what *do* we know about how we can influence the gut-mind connection?

Well, we do know that it's difficult to change your gut microbiota cocktail. What you get from a vaginal birth process, breastfeeding, and the first few years of life pretty much sets your magical mix of gut bacteria by age three. But what *can* be changed is the metabolites of the bacteria—the products your gut bacteria produce. And to do that, you change what you're feeding them.

How to do that? Dr. Emeran Mayer, co-director of the Digestive Disease Research Center at UCLA, recommends the following in his excellent book, *The Mind-Gut Connection*.

1. Eat a diet high in plants and low in animal fats, the latter of which is a source of the molecules that cause chronic low-grade inflammation, which in turn raises the risk of cancer and heart disease
2. Avoid processed food and food additives, like emulsifiers that disrupt your intestinal lining, and artificial sweeteners that alter your metabolism.
3. Reduce stress, which impacts both the composition and activity of your gut bacteria.

Another recommendation for healthy guts include eating fermented foods like kimchi, miso, kombucha, kefir, and good old yogurt to maintain diversity in your gut bacteria. But with guts that are already sick with problems beyond the scope of this episode, like leaky gut, Small Intestine Bacterial Overgrowth (SIBO), or other disorders, fermented foods and probiotics can actually amplify the problems.

But there's no doubt that the way we live and the way we eat are both impacting our guts, which in turn impacts not only our bodies, but our minds. So raise a glass (of kombucha or kefir, perhaps) to your trillions of guests and encourage them to help you make a healthy choice for dinner.