

### Transcript Details

This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: <https://reachmd.com/programs/frontlines-schizophrenia/nutrition-gut-brain-connection-schizophrenia/54157/>

### ReachMD

www.reachmd.com

info@reachmd.com

(866) 423-7849

---

Nutrition and the Gut-Brain Connection in Schizophrenia

### Announcer:

You're listening to *On the Frontlines of Schizophrenia* on ReachMD. And now, here's your host, Dr. Shelina Ramnarine.

### Dr. Ramnarine:

This is *On the Frontlines of Schizophrenia* on ReachMD, and I'm Dr. Shelina Ramnarine. Joining me today to discuss the intersection between nutrition and mental health, and what that may mean for conditions like schizophrenia, is Dr. Deanna Kelly. She's the Dr. William and Carol Carpenter Professor in Psychiatry for Mental Illness Research at the University of Maryland School of Medicine in Baltimore. She's also the Director of the Treatment Research Program at the Maryland Psychiatric Research Center.

Dr. Kelly, welcome to the program.

### Dr. Kelly:

Hi. Thanks so much for having me.

### Dr. Ramnarine:

So, to kick things off, Dr. Kelly, can you walk us through how the gut microbiome influences brain function and mental health?

### Dr. Kelly:

Sure. This is a really interesting topic that I'm talking about today, and it's really been emerging in the past five to 10 years of our understanding of the connection between the gut and the brain.

There are millions of nerves and neurons that actually run between the gut and the brain. They are highly connected. These neurotransmitters, or these chemical messengers, that send messages across synapses and through different channels in the brain are produced often in your gut. We only think of them as being these chemical messengers that are being produced in our brain, but they are produced in the gut as well.

Things like serotonin are particularly found in the gut. So we do have that connection through these neurochemical messengers. But then there's the idea that there are trillions of microbes—literally trillions of these microorganisms—that live in our guts, and they're there often before we're born.

And what's interesting is that the genetic makeup of these microbes is so much greater than our own genetic material, if you can believe that, such that there is data suggesting that the byproducts of these microbes and some of the function of these microbes might actually be necessary for brain function.

And now I'll leave it at that for your next questions.

### Dr. Ramnarine:

That is really interesting. So let's explore some specific dietary strategies. How might a gluten-free diet contribute to better outcome in mental health care?

### Dr. Kelly:

Some of my work that's been ongoing—mine and many others—for about 15, 18 years now is looking at inflammation and immune system modulation possibly through the gut microbiome, but maybe through other mechanisms as well.

And what we've been able to find so far is that people with mental health conditions have high immune response to gluten—higher than the general population. And we've looked at these antibodies to gliadin, the body's immune system to the protein in gluten, and we can

find that about a third of our patients who have schizophrenia, as well as depression and bipolar disorder, have these high rates of these antibodies. The gut is probably leakier.

Microbes are working in certain ways to also contribute to inflammation, et cetera, and the brain becomes inflamed. And in fact, we've completed three clinical trials now where we took people who had these antibodies to gliadin—so they're high inflammation state, high immune system response for whatever reason, maybe related to the microbiome, et cetera—but we give them a gluten-free diet in a randomized double-blind fashion. And we've been able to improve psychiatric symptoms, especially negative symptoms: anhedonia, asociality, motivation, pleasure. Those are the kind of things that there's no treatments for for schizophrenia, and we can improve those symptoms.

But at the same time, we can also improve how the brain's functioning. So we have done neuroimaging at the same time when we've taken away gluten from the diet of people with antibodies—this subgroup of people—and we've been able to show that blood flow actually improves in the brain relative to if you are eating gluten.

**Dr. Ramnarine:**

For those just tuning in, you're listening to *On the Frontlines of Schizophrenia* on ReachMD. I'm Dr. Shelina Ramnarine, and I'm speaking with Dr. Deanna Kelly about the use of diet as a therapeutic tool in schizophrenia management.

So, Dr. Kelly, now that we've discussed the impacts of gluten-free diet on schizophrenia, let's talk about the ketogenic diet. How does this fit into the picture in terms of symptom reduction, quality of life, and overall functioning for this patient population?

**Dr. Kelly:**

Yeah, it's a really good question, and I want to set the stage too. I didn't mention it before, but as we talk about dietary interventions, it's really important to put it into context that we know that standard of care currently is medication treatment for a variety of mental health disorders: schizophrenia, depression, anxiety, bipolar disorder, et cetera. But not all people get relief from treatments. A lot of people have treatment-resistant illness. A lot of people have side effects to their medication. And so, as a field, we are on the search for additional treatments.

Using diet as a treatment is really... I'm talking about it from the medical perspective. We're not talking about diets as they relate to, "Let's lose some weight, let's cut some calories." It's not that simple. It's really hypothesis-driven work, where the way that we interact with the microbiome, or I mentioned with gluten, or even in keto—I'll talk about ketogenic diet space—it really is an underlying understanding of something going wrong in the body, like our cellular energy not working. And we can use food to change that.

And so the ketogenic diet really works on that premise. And what we understand is that the mitochondria, or the powerhouses of all of our cells in our body, are under dramatic stress all of the time. Our mitochondria, these little powerhouses, can work by digesting different fuels and then creating energy in our bodies. But they can do that by a couple ways. One of those is the glucose: eating carbs and putting out energy for our body. But it's not an efficient way to do that.

Ketones, which are a byproduct of fat metabolism, can also be utilized by our mitochondria in a very similar way, but create more energy per unit put in. So they're highly efficient, and in a system where you have cellular energy processes that might be impaired, changing that and bypassing that and giving a new fuel source where our bodies can take that up can be important.

So it's really the idea of metabolic dysfunction—based on ourselves, metabolic, not meaning just our metabolism for weight, but metabolism of every cellular process in the body, including our brain, which is highly dependent and highly using our energy that we produce in in all of our cells.

Using a ketogenic diet is a medical way to then put help someone get into ketosis, which means they're now burning fat instead of glucose. If you do that, if you're bypassing that, you're being very efficient with your energy. And then there's a cascade of things that might happen, including decreased inflammation, decreased oxidative stress, and decreased excitotoxicity.

We don't know for sure, but we understand those are some of the secondary gains by doing this, which leads to improvement in psychiatric symptoms in some patients.

I want to note that this is still is emerging. We don't have the evidence base for sure, and the various large studies that were stringently well done, have not been done, but I think have not been completed. I think that it is important to know that this is an emerging, targeted approach with a specific underlying pathophysiology that we can target, and we believe that it works in this manner, and that's even a larger step forward in understanding mechanism and treatment than we have with our current antipsychotics for schizophrenia.

**Dr. Ramnarine:**

Thinking about translating this science into practice, how can clinicians thoughtfully and safely incorporate gluten-free or ketogenic

approaches for patients?

**Dr. Kelly:**

Yeah, these are good questions, and unfortunately, as a field—this is all of us included—we have not done a good job in education of linking the nutrition to the whole body and to the brain. And so there are many of us, and this is including myself—it took me a while to understand these connections and what that can mean.

And so I think the first step for clinicians is to get to participate in educational programming to understand how this is emerging, to understand the science behind it, and to understand that these are not fad diets. When we're in psychiatry and we're using diet as a medical approach, these are very science-based, so we need to understand the background of that—why they might work and how they might work.

There are educational programs, there are books out there, and I think that as a field we need to do better. There's an organization called Metabolic Mind. It has a website you can go to, and it has a lot of great materials on lived experience from people too that have videos and stories, but then also materials on lab work that you would do, what you need to think about, and what's the evidence.

And there's a variety of programs out there. So I think the first thing is that we do need to be educated, because the concept that this is a fad or that this doesn't have science is far from the truth. It actually has a lot of science. We just need to understand and continue to learn about the process.

So I think that's one of the first steps. The other thing is, it is hard to implement these without a dietary team in place—so aligning, at least, with someone who has some nutritional experience or a registered dietician. I work with a physician assistant who has some training in dietary as well, but understanding how to calculate macronutrients with the ketogenic diet. For example, how much fat do you need in your diet? How much carbohydrates and how much protein?

It really does help to have a dietician on board. However, in our research group, in psychiatry, we've went through extensive training and the mastery programs and launched this program nationally called Live It, Launch It, where we taught people how to implement a ketogenic diet through lived experience.

So programs like that we hopefully will continue to offer, so that we can learn how to do this ourselves. But I think the resources are out there. We have places like Metabolic Mind to go to to get some materials and get some education, but we need to really think about, as we implement, that not everything is without risk, and we really need to have guidance for people—especially people with cognitive disabilities like schizophrenia.

As people would start to think about ketogenic diets, they think this is going to be really hard. People are never going to do this. And we have to ensure that we can have faith in our patients. We need to teach them and empower them to learn the necessary steps.

We need to think about this from an angle of making sure we're educated and making sure we have the resources to help people get started, but making sure we don't sell it too short too soon. We understand that people can be empowered to start and to get started. But we do need the support on just understanding and teaching our patients what they need to do to get started. And I think that starts with education of the prescribers.

**Dr. Ramnarine:**

So before we wrap up our program, Dr. Kelly, do you have any final thoughts you'd like to share with our audience?

**Dr. Kelly:**

I think that, as I mentioned, we're on the cusp of moving down a new path for treatments. We've targeted new areas of study, and I think we should remain open-minded as a field. I think that we need to not sell ourselves short on the idea of diet and nutrition being not evidence-based or not being a real treatment.

I think we need as a field to stay very open-minded. Our patients need us to develop new treatments. We need to be doing the best that we can out there with everything, and eating whole food, less ultra processed food, and healthier food for the brain. Neurotransmitters in themselves need nutrition to be developed.

So if we're putting healthier food in us, we're going to have a healthier brain overall. And I think that we need to get out of the mindset that we need to rely solely on medications to help us. And that comes from a pharmacist, someone who has been in the field studying new pharmacologic treatments. But we need to make sure that we think about how other things we put in our body can modulate the brain. And dietary interventions can be one of them.

**Dr. Ramnarine:**

Those are really great comments to think about as we come to the end of the program. I'd like to thank my guest, Dr. Deanna Kelly, for

joining me to discuss how the gut microbiome can influence and improve mental healthcare. Dr. Kelly, thanks so much for being here.

**Dr. Kelly:**

Thank you so much for having me.

**Announcer:**

You've been listening to *On the Frontlines of Schizophrenia* on ReachMD. To access this and other episodes in our series, visit *On the Frontlines of Schizophrenia* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!