

THE
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**The Ultimate Gut
Health Reset: Detox
Toxins, Conquer
SIBO/SIFO, And
Optimize Your
Microbiome [Part 3]**

with Dr. Karen McCarthy

In this essential continuation of our gut health series, board-certified internal medicine physician [Dr. Karen McCarthy](#) returns to guide us through the most critical and often overlooked threats to your digestive system. We begin with a deep dive into the pervasive toxin glyphosate, the main ingredient in Roundup, and how this "horrible poison" fundamentally disrupts your gut microbiome, weakens the intestinal barrier (leading to leaky gut), and contributes to systemic inflammation. You will learn why certain foods, particularly oats and wheat, should always be bought organic, and discover simple, yet powerful detoxification methods, including a surprising supplement—glycine—that helps force glyphosate out of your system.

We then tackle the epidemic of small intestinal overgrowth: SIBO (Bacterial Overgrowth) and the newly understood SIFO (Fungal Overgrowth). Find out which common medications and lifestyle factors drive these uncomfortable conditions, causing bloating, nutrient deficiencies, and digestive discomfort. Dr. McCarthy shares details on a powerful, custom-fermented yogurt that has been shown in studies to normalize SIBO breath tests and outperform standard antibiotics. Finally, we explore the jaw-dropping connections between your mouth biome, overall health, and sleep. Discover how something as simple as mouthwash can raise your blood pressure and how poor oral hygiene is linked to diseases from allergies to colon cancer. Tune in to equip yourself with practical, science-backed tools for a complete gut health overhaul.

Watch the episode here

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The Ultimate Gut Health Reset: Detox Toxins, Conquer SIBO/SIFO, And Optimize Your Microbiome [Part 3] With Dr. Karen McCarthy

Welcome to the show. I am a board-certified internal medicine physician, also with a Master's in Public Health, with a love for preventative medicine. Our guest is [Dr. McCarthy](#), a board-certified internal medicine physician with decades of experience and still volunteering at the City Rescue Mission. She is still working and has really been ahead of the game on integrative medicine with her medical practice. We are continuing our series on gut health, which has been so great. Welcome back.

Thank you. It's good to be back.

I do not know if you want to do just a brief overview. This way, people can listen to the series out of order if they want.

Basically, we laid the foundation in the first series of Gut Health, the definitions, some of the discussions on the value of probiotics, prebiotics, postbiotics, and how having a healthy diet leads to a healthy gut, which leads to a healthy life. We went over some of the toxins that are in our environment, and that they are increasing in number and concentration. A few of them that we did go over were just cleaning products with triclosan, the pesticides and sprays on golf courses and on our lawns, and Roundup. We are going to be discussing glyphosate in this series.

There are so many toxins we reviewed, and we tried to go over how to eliminate the toxin exposure best and eliminate the toxins once they are in our body because they. As we went over last time, they are a trigger for autoimmune diseases, inflammatory bowel diseases, and cancer. The list goes on and on, even like we studied last time, Parkinson's disease. If we can try to limit the exposure and get rid of the toxins as best we can, we have a good chance of having good health. We also went over the antibiotics, which kill not only bad bacteria but also good bacteria.

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“Dr. Karen McCarthy’s decades of experience and progressive work place her ‘ahead of the game’ in integrative medicine, particularly in the areas of the microbiome, detoxification, and preventive health.”

The effects of antibiotics, especially the fluoroquinolones and clindamycin, can be so detrimental to your gut health and cause leaky gut. The negative effects can extend out to years post having that antibiotic. We tried to go over how to minimize exposure and accumulation of microplastics and nanoplastics, trying to just do simple things, such as changing your cooking ware. I mentioned changing my electric toothbrush that has the castor oil bean bristles instead of nylon or plastics, and my coffee maker that has no plastics in it at all, especially the plastic which you mentioned as being horrible.

We went over this little study they had with foods that have C3G in them. That is the colorant in fruits and flowers that makes the purple color or blue color in your fruits and vegetables. That product, anthocyanin C3G, actually acts like a sponge to absorb the microplastics, and then you can have them excreted out of your body and have less accumulation in your body. Along with this, we also know some of the microplastics are removed from infrared saunas, which also helps, and exercise, sweating, and all that.

A high-fiber diet helps coat the intestines, all of that.

Kimchi was the last thing. That was the one that really acts even more like a sponge to take in the microplastics. Those foods with the C3G anthocyanin are your wild blueberries, purple sweet potatoes, black rice, cabbage, your berries, and purple corn.

Just think purple basically. It's always nice. That's easy. I thought next we would talk because we have discussed it a little bit, but I know there is so much more information about glyphosate. There are a fair amount of people who understand that glyphosate is bad, but there are also a lot of people who still say, "No, you are overreading glyphosate, it is not as bad as you think." Let us talk specifically about glyphosate and the gut.

Glyphosate's Harmful Effects On The Gut Microbiome

Glyphosate can definitely harm the gut, mainly by disrupting this healthy microbiome and weakening the intestinal barrier, the lining of your gut. Research summaries indicate that it can also alter gut bacterial balance. It basically reduces the beneficial bacteria and promotes the bad bacteria, and that affects our digestion, causes inflammation, and disrupts immune signaling. There are main ways that it affects the gut, and they are basically inhibiting the bacteria that have a metabolic route present.

There is a metabolic route present in many bacteria but not in human cells, which may shift the microbial community away from beneficial species. Taking glyphosate, having exposure to glyphosate, shifts the microbial community to being the bad guys. It may increase gut dysbiosis, having that unhealthy balance, and reduce the intestinal barrier integrity by affecting the mucus secretion and microvilli. Those are little hair-like projections on the sides of your intestinal tract that absorb your food and have the proper digestive function.

It seems to be a constant theme with these toxins that it affects the gut lining integrity, cause leaky gut, and make it easier for inflammatory triggers to cross over into your bloodstream, and that causes more inflammation throughout your body. We know it can also change these gut-brain signaling pathways. Remember, we went over the gut-brain axis, and it can affect the gut-brain signaling molecules, which could influence your appetite, your immunity, your moods, and metabolic regulations.

Glyphosate, remember, is what is in Roundup. We should go back to not spraying your lawn. Let it have some weeds. Let it have some healthy bacteria and get rid of Roundup. Do not use it at all. Try to endorse more regenerative farming rather than these heavily sprayed farms and crops. Not only do they spray the crops to guard against insects, but they also use it as a desiccant before they harvest the crops as a drying agent. It is loaded with this horrible poison. I call it poison at this point.

I know, and that is something that I will say as I learned more about this, it kind of shocked me that they use it basically as a dry spray. There are certain crops where the glyphosate exposure is really high because of this dry spraying.

They can use other drying agents that are safe.

They can, but I do think that a lot of times, people talk about pharma and big medicine and everything, while glyphosate spraying is very lucrative. It is worse and more, in my opinion, because it is just a money-making machine. A lot of the health effects and detrimental effects that it has are overlooked, and I think that they try to downplay a lot of the dangers of it because of that.

It is. Just as a little aside, when I was taking my walk on our break here, I just heard on the radio that a very big company that makes athletic wear has finally phased out PFAS, the polyfluoroalkyl substances, the forever chemicals, from their water-resistant products. That is good news. Gradually, it is like you said, it will take time. I am hoping it will be true for glyphosate exposure in our food and

water. Trying to get clean sources and just washing and prepping food tries to minimize your environmental contact with this.

I would say always go organic when you are buying your oats, your wheat base, because oats can be high in glyphosate concentration, your wheat-based products, leafy greens, potatoes, and berries. Certified organic farming prohibits this glyphosate use, and that shows these people that those who ingest this type of glyphosate-free food have a big drop in their urinary glyphosate concentration when they switch to these organic diets.

Not everybody is in a financial spot where they can eat all organic. That is where I think sometimes educating people on which foods have the highest amount of glyphosates in them and what is the hardest to wash off, is helpful. If you think about getting oats, it is dry, so you cannot really wash them off. Plus, on top of that, if they are doing this dry spraying, they are getting this double hit of the glyphosates.

That would be one of those areas where you say, "I really need to try to get organic for the wheat and for the oats," because that level is so high, and I cannot rinse them. Sometimes frozen is a lot cheaper, and you can still get organic, or if you get non-organic, then you can try to wash them and soak them in baking soda to at least decrease the amount that is on them. At least take steps. If you cannot afford all organic, there are other steps you can take to still try to decrease your exposure.

That one to two teaspoons of baking soda in water for 10 to 15 minutes really helps. That baking soda soak removes a lot of these toxins. As you mentioned, the peeling of some of these vegetables and fruits helps. Wash and scrub as best you can and do as best you can, but there are some safe things that are inexpensive that you can do. Always limit processed foods and glyphosate-treated grains as best you can. That is in a lot of our cereals and snacks. Choose these non-GMO or glyphosate-residue-free certified products whenever available, because then they are less likely to have any of this contaminant.

Choose grass-fed or pastured meats and eggs over the other conventionally fed options, since many of these industrial feeding crops that they give to these non-free-range animals are glyphosate-treated crops with residues. It accumulates in the animal product, and then we eat the meat, and we get it from that source, too. We mentioned this last time. Get a good filtration system, reverse osmosis, or activated charcoal, to remove glyphosate. If you live near an agricultural or heavily sprayed area, consider testing the water.

Glycine Supplementation To Detoxify Glyphosate

We know glyphosate is also aerosolized, so it is not just in your drinking water and what you ingest. I think we are going to find out it has done so much harm, and it should just be totally outlawed, to be honest. One interesting thing that I was reading is that glyphosate, this horrible herbicide pesticide, is an analog of the amino acid glycine. Remember, glycine is what you have in your sleep product. It is a very good product to help you to sleep, and it is very good for your muscles. This amino acid is very healthy to have.

Glyphosate attaches in places where you need glycine. Importantly, glycine is used up in the detoxification process. Hence, many of us do not have enough glycine for detoxification. One doctor came up with this way to eliminate glyphosate. Saturate your body with glycine. It is a benign supplement to take. He had one teaspoon or four grams of glycine powder twice a day for a few weeks, then you can lower the dose after that to just a fourth of a teaspoon twice a day. This glycine forces the glyphosate out of your system and then allows it to be eliminated through your urine.

Tweet: Glyphosate binds where glycine is needed, while glycine itself is depleted during detoxification. As a result, many people lack enough glycine to properly detox.

That is awesome. Glycine is so important for so many reasons. There has been a lot of evidence in terms of how it helps with sleep, which is why at Duration Wellness, we developed Sleep Club, and it has glycine as one of its big parts. It really does help in terms of sleep, which is also really important in detoxifying your brain. When you have good sleep, your immune system can function better. You can detoxify better, with decreased inflammation. Sleep is so important in that process. It is really cool to see that it helps with removing some of the glyphosate. That is very cool.

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“Good sleep **strengthens** the immune system, **improves** detoxification, and helps **reduce** inflammation.”

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Even I would bump it up now. I am taking 2,000 milligrams of glyphosate. The other thing is that glyphosate is also a chelating agent. That means it chelates or binds out a lot of our minerals, trace minerals that are in food. Because it binds to glyphosate, those minerals are no longer available for us to absorb. It basically is a way of depleting our trace minerals. There is one exception, one

mineral, aluminum. Glyphosate takes aluminum across the gut wall into the tissues. We will go into aluminum in a minute here. Another way, as we know, is the sulforaphanes in broccoli sprouts. I take the Avmacol, which is a good sulforaphane supplement. Infrared sauna, we already mentioned.

Just to go back to the sulfuraphane, so people know, it supports your body's own detoxification system. It really helps the liver, in terms of which is one of your body's biggest detoxifiers. It helps with all of the detoxification process, and it's so important. It is what is typically in a lot of cruciferous vegetables. Broccoli, cauliflower. When you look at the levels, what it is really high in are like the smaller, the earlier versions, like the broccoli sprouts, the cauliflower sprouts, things like that. A lot of people can make them at home very cheaply, and anyway, very helpful. I know we have added them to our own diet. We have them every week, all the time. I try to add them to literally everything.

You can get them already pre-made if it is hard to grow them on your own. It is not hard, but you have to be careful about contamination.

Also, you just have to have the time and stuff. There are a lot of micro-growers from whom you can buy them. Some stores sell them now. A lot of people who are on a budget can make them very cheaply. Also, you just touched on aluminum. Let us talk about that because I feel like a lot of people say, "Aluminum is so bad." Other people say, "You are overplaying aluminum."

We do know it has an effect on brain health. We do know that. Interestingly, when I researched this, a common ailment related to aluminum toxicity is an underactive thyroid, but it's also related to the gut because aluminum, such as that found in antacids, actually interferes with the intestinal absorption of thyroid hormones. Being a metal, it also has an affinity for the nervous system and tends to collect in our brain, our spinal cord, and the enteric nervous system of the gut. In all these places, aluminum can then block vital functions in those areas of your body. Basically, one way to eliminate aluminum is to get rid of aluminum products. Also, to increase your intake of silica. You can get that by using silica-rich herbs like cilantro.

Cilantro is great.

It is a good detoxifier. There is this horsetail, also high in silica, and a liposomal silica product called BioSil. Citric acid has also been shown to mobilize aluminum. An easy, inexpensive strategy is to squeeze some lemon into a bottle of water and then just drink that every day. That is also a very good way. Malic acid is in apple cider vinegar. I take a glass of apple cider vinegar every morning. That is another way to get out the aluminum. Overall, there are these toxins, but there are some things that we can do to avoid exposure and have them excreted out of our body before they do some serious harm.

I also will say, we talked about it for a little bit, I am a big proponent of sauna, and I do think that there are a lot of benefits that we are finding out. We are probably going to find out more and more that it helps with microplastic exposure, trying to excrete the plastics, and even with the glyphosates and everything, because your body really does try to remove these. There are no great studies, but there have been case reports of people measuring before and after. With the saunas, they really end up decreasing the exposure and the amount, which is exciting.

Another topic that a lot of people probably have heard of and a lot of people probably do not understand is small intestinal bacterial overgrowth, which is also called SIBO. There is also a new one, which is small intestinal fungal overgrowth, or SIFO. That is really even more new. A lot of people probably have at least heard of SIBO, just because there are a lot of people who have it now. I thought, in terms of gut health, that maybe we would touch on SIBO, Small Intestinal Bacterial Overgrowth, and then also the fungal overgrowth.

Introduction To Small Intestinal Bacterial And Fungal Overgrowth (SIBO/SIFO)

There is not much on it, but now we are finding out more and more. SIBO stands for Small Intestinal Bacterial Overgrowth, and it is a condition where too many bacteria grow in the small intestine. Remember, we were talking mostly about the colon, the large intestine, and your intestinal tract, but here SIBO is referring to an overgrowth of bad bacteria in the small intestine. You have your mouth, esophagus, stomach, and then your small bowel, your small intestine, and then your large intestine, the colon. We are finding out that the majority of people in the United States eating this Western diet have some degree of SIBO, which is very sad.

We see that when you have developed this small intestinal bacterial overgrowth, you will have symptoms of bloating, gas, and abdominal pain. You can have diarrhea, constipation, and nutrient deficiencies. It can hinder your gut motility, slowing it down, and cause other digestive problems, as we see in irritable bowels. They are accumulating these bad bacteria in large numbers in this part of your intestinal tract, the small bowel. SIFO stands for Small Intestinal Fungal Overgrowth, and it is a condition in which an excessive amount of fungi, mostly *Candida* species, grows in the small intestine.

It, too, just like SIBO, can cause a lot of serious digestive symptoms. Small Intestinal Fungal Overgrowth is a form of gut dysbiosis where the fungus overgrows in the small bowel. By one common definition, they diagnose it by finding more than 1,000 fungal colony-forming units per ml in the small intestinal fluid. It has the same symptoms as small intestinal bacterial overgrowth. SIFO, fungal overgrowth, has bloating, gas, abdominal pain, diarrhea, nausea, and general digestive discomfort after eating.

Some people also report fatigue and oral thrush, which is a white tongue, thrush fungus on the tongue. More frequent vaginal yeast infections and esophageal candidiasis, which is something we would see years ago in immunocompromised patients. They develop the fungus in the esophagus, very painful. We used to see it in HIV patients before we had proper treatments for that. It is just this feeling of brain fog, joint aches, and general malaise. SIFO is less well studied than SIBO, and even the diagnosis and treatments are often difficult. It is really empiric therapy-based rather than a single standard test for that.

What would you say would cause it? Again, a lot of people have SIBO, and I think we are finding more and more about it.

SIBO usually happens when the small intestine's normal defenses break down, letting bacteria build up where they should not. Common causes include patients who have slower gut movement, especially the movement of food and contents of the stomach into the small bowel. In that area, when that movement is slow, then you will get this symptom that we see in diabetics. Diabetics can also develop gastroparesis, where there is a slowing of the emptying out of the stomach contents into the small bowel.

GLP-1 agonists, I'm wondering now, and I have not read anything about it, but they slow down and install this gastroparesis state, which slows down the emptying of your stomach contents into the intestinal tract. Anything that causes that state can potentially cause SIBO and SIFO. The other thing is less stomach acid, which really aids in the growth of bad bacteria. We know antacids can do that, especially proton pump inhibitors, which reduce your stomach acid content. These proton pump inhibitors, like Prilosec, Aciphex, Protonix, and Nexium, are all what we call PPIs.

They basically shut down your acid production in the stomach, and that then shuts down your body's defense to kill off bad bacteria that can harbor and stay in your small bowel and cause fungal infections. These slow gut movements, low stomach acid, and structural problems in the intestinal

tract that hinder the motility of your gut are drivers. Of course, there are certain diseases like celiac disease, which is a wheat allergy disease, a gliadin reaction. Diabetes can do this. Again, I think that is because diabetics can often get autonomic nervous system dysfunction, and one of the autonomic nervous system functions is to have that normal peristaltic movement, and that can be compromised in a diabetic.

It can also be compromised in somebody with Crohn's disease or scleroderma, which is where you have connective tissue abnormalities, and that can hinder normal motion and motility. These bad bacteria do not get swept along effectively, nor does the fungus, and then they colonize in your small bowel. Other things like structural changes from adhesions from prior surgery, strictures, fistulas, and also immune or mucosal problems make it easier for these bad bacteria to persist.

I think that is probably, honestly, the majority. I just think of the number of people that I have seen with SIBO, and it is even more than people who have diabetes and celiac. It seems like, or maybe it is just the population that I see, it seems like almost half of them have SIBO. Briefly, we had talked about vitamin B1 in constipation. It would be really cool to see a study that would actually give this a try to see if it helps if there is decreased motility. One, to see if patients who have constipation have higher rates of SIBO. Two, if they do, if B1 helped with that. I am just thinking that would be interesting.

That would be a very good study because it would show that if you correct SIBO with a good gut health diet, and that symptom resolved because you could measure the thiamine levels going up and the symptoms resolving, then you could say that it is from a good gut microbiome producing the thiamine and then allowing this normal peristaltic wave to occur. It is all connected, I believe. Other common conditions, I already mentioned celiac, diabetes, scleroderma, and connective tissue disorders, Crohn's, and inflammatory bowel disease, and having bariatric surgery is also a risk factor.

SIFO, it's pretty much the same thing. Low stomach acid can cause small intestinal fungal overgrowth, impaired gut motility, dysbiosis from antibiotics, steroids, or other broad-spectrum drugs, which can wipe out protective bacteria, and then cause the fungus to grow and proliferate. Weakened and suppressed immunity, such as we see in diabetes, HIV, cancer, autoimmune disease, immunosuppressant drugs, and steroids, is a factor. Again, the same thing with structural changes after GI surgery, including colectomies and altered anatomy that promote stasis or a lack of flow and peristaltic motion.

Metabolic factors are very important. High-sugar diets feed fungus, and then fungus can really grow if you are on a high-sugar diet. Obesity and possibly some hormonal states can favor fungal overgrowth, but they are basically very similar drivers of SIBO and SIFO. They are very similar. They coexist, and the management often targets motility, acid status, and microbial balance. It's something that is very important to correct.

Tweet: High-sugar diets feed fungus, allowing it to grow and thrive in the body.

I 100% agree. You touched a little bit on how it can be a difficult diagnosis, but how do people start if they are concerned about this? SIBO is a little bit more understood, so diagnosis is a little bit easier. How are these diagnosed?

Diagnosis Of SIBO With Breath Tests And Nutritional Deficiencies

You want to get a good history, get their symptoms, and then order some specific tests that look for excess gas-producing bacteria in the small intestine, because these bad bacteria in your small intestine that cause small intestinal overgrowth are gas-producing. They produce hydrogen gas and methane gas. That is why we have the breath test. I do not know if anyone in your audience has done

a breath test, but you drink this sugar solution, glucose or lactulose, and then you breathe into a device at timed intervals, and a rapid rise of hydrogen or methane in your breath suggests that you do indeed have SIBO.

That is the most common non-invasive test, and you can even buy these at-home breath units called AIRE, but they are not cheap. They may come down in price, but anyway, you can get this covered by most insurance companies from your doctor, a breath test for SIBO. Small intestine aspirates and cultures, when you are doing an upper endoscopy and taking fluid, might be used, but it is not as often used because that is so invasive. We have blood tests just to check for vitamin deficiencies, especially B12 and fat-soluble vitamins.

They will be lower in level, or you will have low blood protein levels from malabsorption due to SIBO. You can check your stool to see if there is any fat malabsorption. Imaging is not so valuable unless you want to see structure, ruling out structural problems. SIBO, really, is diagnosed mainly through the breath test. It is usually treated with three main goals. To reduce the bacterial overgrowth, fix your nutritional deficiencies, and address the underlying cause of why this keeps coming back.

I do think it is interesting to touch on this. I think for a lot of people who are diagnosed with SIBO, the testing for nutritional deficiencies can sometimes be missed. It is very easy to be like, "These are your symptoms, we think it could be this. We found that this is going on, so now we're going to treat it," but then maybe did not realize that there could have been these other deficiencies that started, which then can make your symptoms maybe not fully go away even though you have treated the SIBO because now you have nutritional deficiencies. You still have nutrition deficiencies.

It would also be a confirmatory test that you have SIBO, along with the breath test.

That is just something for people to be aware of, to advocate for themselves.

There is a Spectracell nutritional test that you can do that gets all of these nutrients. It is big, but it can be very helpful for people who have had SIBO for years.

What she is talking about is that there are actually a few companies that do this, but they basically go through micronutrients, and it is a very large panel, and it goes through all of these. Typically, they are not covered by insurance, but most of the time, again, cost-prohibitive. A lot of times if you talk to your doctor and you say, "I was diagnosed with SIBO, I am concerned," you can get at least B12, vitamin D, vitamins like that that can get covered and can be ordered, even if it is not in a large lab like that.

SIFO, the fungal form, is diagnosed mainly by combining clinical symptoms with some of these nutritional tests. There is no single non-invasive standard test yet for SIFO. Many clinicians will just have a working diagnosis based on the symptoms of SIFO. They will notice that patients who give a history of having their bowel symptoms worsen after eating sugar, that is a clue, especially if the patient is on antibiotics or PPIs. With time, they will have some more sophisticated tests. They are using PCR testing, blood and urine markers, and Candida antibody panels, but really, there is no gold standard out there yet.

It will come, though. It is a very new and emerging thing that we are starting to understand. **I do think it explains. There are a lot of people who get treated for SIBO. They improve for a while, and then they start having issues again, and then they are negative for SIBO. You do wonder if it could be this fungal overgrowth. As we understand more, we will probably end up having better tests to look into this. The next thing is treatment. If somebody finds out that they have small intestinal bacterial overgrowth or SIBO, or this fungal overgrowth, SIFO, how do they actually treat it?**

In traditional medicine, they will start with an antibiotic called rifaximin. It is what I use for travelers' diarrhea. It is pretty benign and does not have all those negative effects of real antibiotics. I look at it almost like a probiotic antibiotic, but anyway, rifaximin is the standard first-line therapy, and it is often used for 1 to 2 weeks to reduce the excess bacteria in your small intestine. Although around 50% of patients may respond to this treatment, SIBO often returns. Unless you are going to change your diet, SIBO is going to return.

For more complex patterns, especially the methane-predominant bacteria, doctors may combine this rifaximin with another antibiotic called neomycin. Years ago, I used to give that to my patients with hepatic encephalopathy before rifaximin came along. It is an antibiotic that is really not absorbed into the body, just stays in the GI tract. It was useful for lowering the ammonia level that we would see in patients with cirrhotic liver, cirrhosis of the liver, which would produce high ammonia levels and cause confusion.

That was something we called hepatic encephalopathy. Interestingly, they will still use that for SIBO. Some providers still use herbal antimicrobials, botanical blends that may help with some of this, but I believe that one of the most effective ways to correct SIBO and SIFO is to eliminate the triggers that cause it and to eat homemade yogurt as outlined by Dr. Davis in his gut health book. I will be discussing that in a little bit. He is a brilliant physician, an MD cardiologist, who was in the early part of his career putting in stents and doing all of the typical things you do for cardiac health, statin drugs, and everything.

He still kept seeing patients who would have recurring arterial diseases, even when they took the traditional pharmaceuticals to help them correct their risk factors. He came about the importance of gut health, cardiovascular health, and overall health, and one of the biggest areas that was not well studied was SIBO and SIFO. I will go over that in a little bit. It is recommended in the short term for low-FODMAP foods, but that is just going to reduce the gas production. It does not really do much.

Treatment Strategies Including Low FODMAP Diet And Antifungals

I do want to go into that because I think that is something that is often recommended, and people do not understand the reasoning behind it. The FODMAP diet is basically like a low-fermentation sort of diet. It does help because the foods that it reduces are the ones that can have more gas-producing properties. It really should only be temporary because being on that diet permanently actually removes a lot of very healthy foods that really have high fiber for restoring your gut health overall. When you are doing that, it really should be a bridge.

Two to four weeks, they suggest, is the longest.

As you then reintroduce some of these foods. Again, we already talked about all the blue and purple foods like the purple sweet potatoes and the blueberries, and how helpful they are, so you do not want to always cut them. It's a temporary thing, and then you reintroduce them.

Your nutrients and vitamins, as you said. SIFO is usually treated with an anti-fungal layered approach plus dietary and lifestyle changes to reduce fungal load and correct the underlying gut health problems that let it develop. These anti-fungal prescription drugs. The first line one is fluconazole or Diflucan, which a lot of women are familiar with for yeast infections, vaginal yeast infections, or you can use nystatin because it mostly stays in the gut. That is why I kind of like that one.

Itraconazole or Sporanox are also other possibilities. There are some herbal anti-fungals that clinicians use, like oregano oil and berberine, which I love because it helps with a lot of other problems with weight gain. It helps with your insulin resistance, your sugar metabolism, and fatty

liver. It is a natural GLP-1 agonist. That is also one of the botanicals that you can take. Garlic, olive leaf-based products, and then an anti-Candida or low-sugar, low-fermentable diet, limiting that sugar.

Just to go back to that, I am curious. Olive leaf. Would that include olive oil? Like, if you are having olive oil, or is that separate?

It says olive leaf because it did say specifically oregano oil, not oregano, so I think it would be referring to the actual leaf.

I would just be interested to know.

It probably has the fiber, maybe.

Maybe, I do not know. Also, again, we know that we talked earlier about how the Mediterranean diet is really one of the best diets for gut health. Olive oil is a big part of that. Garlic is on this list, too. You wonder if that is also just because this again would help decrease your SIFO risk there. I was just curious.

I am not sure either. Some really interesting studies can be done. They suggest meal spacing, leaving 3 to 4 hours between meals. Also, prokinetic agents help you move the bowel along because remember it is stasis of the food contents in the upper intestinal tract that causes this overgrowth. Some of the botanical prokinetic agents are artichokes and ginger, so that helps keeping your motility normal. Of course, we need to fix the root causes, like the low stomach acid from PPIs. It will be important to taper PPIs because you can get a rebound effect with your gastrin and your acid production.

There are reasons that people are on antacid medications. It does decrease. If somebody has a very severe ulcer, or if they have a pre-cancerous esophagus is called Barrett's, but its pre-cancer changes because the acid has been so bad. Those are the people who need those antacids. I think it is important for people to know prevention, what they can do, right? Like, "If you're drinking, stop drinking, because that is going to make it all worse."

If you stop drinking, then maybe you are actually going to be able to get off of your PPI because that is exacerbating the problem. Also, not eating late at night, sitting up, and all of the reflux precautions help. There are a lot of things where people can sometimes make some changes so they can be at least weaned off or on a decreased dose of this medicine. That is good to think of.

They suggested bitters here. They support your digestion, too. In another article, I read about papaya and papain. There are some other naturals out there that would help. Of course, correcting your vitamin D deficiency and correcting low zinc and omega-3s and other immune-supportive nutrients, along with the gut lining support of glutamine and collagen, is important as part of the long-term restoration.

Tweet: Correcting vitamin D deficiency, low zinc, omega-3s, and other immune-supportive nutrients—along with gut lining support from glutamine and collagen—is an important part of long-term restoration.

Because these overlap, SIBO and SIFO, with IBS, irritable bowel syndrome, many protocols combine anti-fungal steps with probiotics, stress reduction, and careful reintroduction of fiber once the fungal load is under control. SIBO and SIFO are a big part of the cause of irritable bowel. They recommend an anti-Candida diet for SIFO, a low-sugar, low-fermentable eating pattern, and also to limit that sugar and sweeteners, as you said, and that includes, unfortunately, honey, maple syrup, agave, high-fructose corn syrup, juices, and other sugary drinks. I love my honey and my tea.

I know, but still, people think like, "I'm using maple syrup, or I'm using honey," it does. It will still spike your insulin. It is still a sugar, and so, and same with the white bread, the pastas, and the carbs. All of those are really trying to minimize and decrease.

We know the sugar substitutes are not good either, so we will go into that later, but we find carbs, you all know this, white bread, white rice, pasta, pastries, breakfast cereals, packaged goods, high mold, and some dairy products, you can see that with aged cheeses and some of the fermented dairy products, plus foods prone to mold like peanuts, old nuts, moldy grains, and non-starchy vegetables, you can see some of it. You just do the best you can.

Eating those leafy greens, broccoli, cauliflower, cabbage, asparagus, onion, zucchini, and other low-sugar vegetables. Low-sugar fruits are your berries, blueberries, raspberries, strawberries, and small amounts of apples. With larger fruits and tropical fruits like pineapple, try to limit them. You want to eat your high-quality protein and fats. Lean meats, poultry, eggs, fatty fish, and healthy fats like olive oil, avocado, coconut oil, nuts, and seeds that are low in mold, and that would be your almonds, walnuts, and pumpkin seeds. Anti-fungal herbs and spices like oregano, garlic, ginger, cinnamon, turmeric, black pepper, and other culinary spices.

Garlic and everything.

Garlic may not make you smell nice, but it is very healthy for you. That is how this diet fits for SIFO treatment. It is basically, again, changing out how you eat and doing these supports like the prokinetics, gut lining supports like glutamine, and attention to what you're eating and having more of a diet that does not promote overgrowth of bad bacteria or fungus.

If you step back, because I think sometimes all of this can be overwhelming, it kind of is the basic, eat healthy. It's the same thing. Again, low sugar, low processed foods, and increase your veggies. All the purple vegetables and fruits. Again, the basics that help. We talked earlier briefly about how your gut biome is also affected by your mouth biome. That would be a good topic to talk about, and also just chewing and how that can have a big effect on that. Let us just get started. How does chewing affect the gut biome?

The Impact Of Chewing And Mouthwash On Nitric Oxide And Blood Pressure

I am glad you asked that because this was a recent study by the author, Dr. Rossi. She is the founder of the Gut Health Clinic in London. At this conference, she gave a tip for better gut health that is useful no matter what you are putting in your mouth. She says to chew food more. Most of us are in a hurry. How many times do you chew your food? I am lucky if I do it five times, maybe.

I try to be better, but now I have a three-year-old and a one-year-old, and I scarf my food.

They are little boys, so they are hungry little boys. Not only do we start to physically break down our food in our mouths, but we also have enzymes in our saliva that start to chemically break it down. That is why it is so important for people to see that their digestion starts in the mouth. That is the first part of your digestive tract. Even chewing food releases healthy nitric oxide agents that are beneficial for your body and your overall health. If you skip that process, and sometimes juice will do that, even though you are getting a lot of concentrated nutrients, it will lose some of the benefits of this chewing.

You're also not having the fiber. That's one of the biggest.

That is right. Research shows, though, that the more we chew, the more nutrients we are coaxing out of our food, which is good for our guts. One study looked at almonds, and they compared people who chewed the almonds ten times, which is a long time for me, versus people who chewed the

almonds 40 times. They showed that when you chewed the almonds 40 times, you actually absorbed so much more of the good nutrients in almonds. If you only chewed them ten times, you were absorbing a lot of it but not getting that full health potential.

Tweet: The more we chew, the more nutrients we extract from our food, which is beneficial for our gut health.

Chewing your food is really important for the extraction of a lot of the nutrition into your body. However, for many of us, chewing more is easier said than done. There are lots of different chewing apps, I was not aware of them, out there to help people chew more slowly. What I say to a lot of patients, which is hard to do, is to just focus at least on trying to chew more, at least your first two mouthfuls of food at every meal. Especially if you are having dental implants placed, you are really limiting the amount of time that you are chewing food.

Anyway, you are never going to be doing 30 chews. That is very hard, or 40 chews for sure with every mouthful. Just focusing at least on the first two mouthfuls might help you to get more nutrients into you with each meal. Even just adding on three extra chews than what you are used to chewing helps with your gut health and getting nutrition in it. Try to count next time to yourself, not out loud, while you are chewing your food, and it does help you. It is a little simple thing there with the gut health starting in the mouth.

Chewing your food does give your body time to send the signals when you are full. It also helps in terms of not overeating.

Hormones are released, saying we are going to start ingesting food.

It is another sign that it is healthier, although it is a little bit hard in our go-go-go society. How would you say an unhealthy oral flora would contribute to poor health outcomes?

This was also interesting in recent data. In one study, the use of mouthwash twice a day was associated with a significant increase in systolic blood pressure after one week. A significant increase.

That is wild. I feel like people would not know that, and it is also not. I would be surprised if a cardiologist had that in their questionnaire, like, "Are you using a mouthwash?" Who would think that a mouthwash would increase your blood pressure?

During COVID, Listerine mouthwash was encouraged to decrease the viral load, but why would it do that? After they stopped using the mouthwash, they recovered from its use, and it resulted in an enrichment in nitrate-producing bacteria on the tongue. Nitric oxide is produced in the mouth when you start your digestion in the mouth, and that nitric oxide is so important for your cardiovascular health, and it is also a vasodilator. That is why they think in this study the mouthwash, like Listerine and other ones, wipes out that process and lowers your nitric oxide production because your good bacteria are producing it in your oral flora, and that causes vasoconstriction, which causes high blood pressure. Who would know that?

That is why I find it very interesting.

Me too.

I can see it. Nitric oxide, being a vasodilator, means it dilates the veins. You are having this dilation, which basically allows more blood flow. That is a lot of times what people take medication for for cardiovascular issues, to try to open up those blood vessels in their heart to get the blood flow there. Your body makes this naturally. Taking that away would then cause constriction, meaning that the tightening of the vessels would cause an effect on the blood pressure. I find that interesting. I have never heard that before.

Oral Bacteria Translocation Linking Mouth Flora To Systemic Disease

I know. We know that beets and beet roots are really good nitric oxide producers that can lower your blood pressure, too. I just find that it is something simple, and it would be another good study to have a cardiologist measure your nitric oxide content before and after this mouthwash. There is also something interesting, a word called translocation. Translocation means that bacteria can move from their usual habitat in the oral cavity to a distant body site, and studies show this can happen anywhere in the gastrointestinal tract.

Oral strains of oral bacteria can be detected in our stool and other extra-oral sites. One of the big ones that they are studying is *Fusobacterium nucleatum*. I am just going to say *Fusobacterium* as the anaerobic oral commensal that is important in periodontal plaques and has been linked to disease when it appears outside the mouth. It can help other bacteria to invade tissues, and bad bacteria invade tissues, and have factors associated with forming biofilm and endothelial barrier disruption.

One of the big ones here with clinical relevance is that the oral-to-gut translocation has been observed in healthy people, but appears more common or more pronounced in patients who have some kind of disease state, including colorectal cancer, rheumatoid arthritis, inflammatory bowel disease, and nasopharyngeal head and neck cancers. Here again, this translocation of the bad bacteria to other parts of your body from your mouth can cause and is found in high concentration in these disease states.

That does not mean that it is causality, but the association is well-documented. We see that this other bacterium, *Pseudomonadota*, I believe it is pronounced, is present in higher concentrations in the mouth and in the gut. They also play an important role in producing short-chain fatty acids and boosting the growth of beneficial microbes in your intestines and in your mouth. *Fusiform* bacteria represent another prominent type of microbes, and while they can help stimulate inflammatory responses to fight pathogens, they may also drive inflammation and are linked to periodontal disease.

P. gingivalis is also linked to periodontal disease, which, as you already mentioned, is linked to cardiovascular disease. We see this trend here. Firmicutes are another type of bacteria that tend to be particularly abundant in the esophagus. They are finding out that interestingly, Firmicutes, which are centrally involved in glucose and insulin metabolism, belong to the phylum most adversely affected by artificial sweeteners like saccharin and other artificial sucralose products. Artificial sweeteners are worse than honey and maple syrup. I would just totally eliminate those from your diet.

A lot of times it is downplayed. There is this whole aspect that I think people do not talk about enough in terms of how it can affect your mouth microbiota, which is so important, and then how it also affects your gut. As we are learning in the series, that then really has such a big impact on the rest of your body, inflammation and the gut-brain connection, leaky brain, all of that. Inflammation drives inflammation. If these added fake sweeteners are going to mess that up, then that is all part of the inflammation process. That is often downplayed. People talk about this.

People would take the Zero Coke, thinking that it has less sugar, but it is actually harmful. Saliva dysbiosis was also associated with upper GI disorders, including gastroesophageal reflux and symptomatic esophagitis, which is inflammation of the esophagus. That can lead to inflammation of the esophagus, Barrett's esophagitis, which is a pre-cancerous cells in your esophageal lining, which can lead to esophageal cancer.

Tweet: People often choose Coke Zero thinking it contains less sugar, but it can still be harmful.

We know that saliva dysbiosis can lead to this overgrowth of *Helicobacter pylori*, which can cause gastritis and atrophic *H. pylori* gastritis, and again, gastric cancers and intestinal metaplasia, which are abnormal cells in your intestinal tract. So much we are finding out. Two other ones were *Prevotella* and fusiform bacteria in saliva, which were associated with gastric atrophy and also with intestinal metaplasia. It is not a good thing to have these bad bacteria in your mouth either.

That is where I think, and part of the reason I wanted to bring it up is that a lot of people do not realize how important it is. People think brushing your teeth is important to prevent cavities. I think that is where a lot of the education kind of stops. Even me growing up, that is really what I thought, that you do not want cavities. You do not want to have gross teeth. You do not want to have bad breath.

I really did not understand this whole bacterial system in your mouth and how it can be such a driver of inflammation. Not only is it affecting the microbiota further downstream, which we can see in colon cancer risks, and we can see with the inflammation and having an effect even on the acid production and everything, but it also has these effects on your cardiovascular risk system. It is very important. A lot of people do not realize how important it is.

Yes. We are going to find out more and more about that, too. It is not just your dental caries. It is huge for our health, and it is just as important. Even this simple thing with chewing.

We are going to learn more about it. There are going to be more interventions and testing. I know at least there are a couple where you can actually get the bacteria in your mouth tested, so you can get the microbiome in your mouth. That is a good thing to get. Again, unfortunately, a lot of these things are out of pocket, and they are not available to everyone, but I think in the future, they will probably be able to come up with more that are more affordable and available for people. At least we are starting to learn more about it, and I think there are at least some tests out there, which is good. That is showing that progress is being made there.

They still need to make a lot of progress in having a reliable, good gut assay, GI stool specimen, and analyzing that for your bacterial, your microbiome content, because there is a lot of error in that, and it is not really perfected yet, and there can be a lot of variance showing false results. Hopefully, they will improve that, too.

It is cool that they are out there. Even for kids, there are now these kits where you can test their bacteria in there, and you can see in terms of the population and how it changes. I am happy that at least they are starting to be made and developed and everything. We talked a little bit, especially when we were talking about the SIBO and the SIFO, about how to fix it. One of the things you brought up for SIBO was this homemade yogurt.

That was in Dr. William Davis's gut health book. I wanted to touch base on that because I think it's a good intervention for people who might be struggling with this, especially since we went over the SIBO treatment, and a lot of people do respond, over half or around half, but a lot of people will get it again. I also think, do not just take the pill. Try to treat the underlying problem. If this is able to help with that, I think it is good to go over so that people may have another tool in their toolbox.

Yes. Again, he is Dr. William Davis. He is a cardiologist, MD, and an author of the [Wheat Belly](#) book that came out decades ago, and Super Gut. Dr. Davis's SIBO yogurt targets small intestinal bacterial overgrowth, using these specific probiotic strains that have been fermented into a high count in the yogurt. It combines strains like *Lactobacillus reuteri*, *Lactobacillus gasseri*, and originally had *Bacillus coagulans* in it, but now they use *Bacillus subtilis* HU58 because it has better fermentation reliability. Especially the *Lactobacillus reuteri*, these strains colonize the upper GI tract, and they produce those bacteriocins.

Remember, we discussed those earlier. They are like postbiotics, which are natural antibiotics that suppress SIBO microbes, such as gram-negative bacteria like Klebsiella, E. coli, and also Streptococcus, a gram-positive bacterium. These bacteriocins are small protein-based toxins produced by the good bacteria to target and kill or inhibit closely related bacterial strains that are the bad guys. They function like natural, narrow-spectrum antibiotics, these bacteriocins. This yogurt, high in Lactobacillus reuteri and those other bacteria that I mentioned, really helps to produce high amounts of that bacteriocin, acting like a natural antibiotic.

Unlike the broad-spectrum antibiotics we use, they spare most of the beneficial microbes, minimizing dysbiosis. In the context of SIBO, yogurt from Dr. Davis, strains like L. reuteri, Lactobacillus reuteri, and Lactobacillus gasseri, produce, again, those high amounts of bacteriocins that suppress overgrowth of the bad bacteria. It is very interesting how he formulated it, and he had to do some tweaking with it all. It does help restore balance and support immunity and combat issues like irritable bowel disease or inflammatory bowel disease and infections without harming your overall good bacteria. How do you make it?

I am making it, and you basically take a quart of organic half-and-half, I get organic for sure, and then you can mix with that one to two tablespoons of inulin. That is your prebiotic fiber, remember, and that is mixed with this half-and-half, and then you use a starter. There is a starter that you can buy called Gastrus as your starter, or you can use two tablespoons of your prior batch of yogurt, which is what I am doing now. You stir it to make this milk slurry and put it in two glass bowls in your yogurt maker, and you basically ferment it at 100 degrees for 36 hours. Some people make it in their Instant Pot, but I have mine. It was inexpensive, this yogurt maker, it is very easy.

You try to consume about a half a cup daily for four weeks to get rid of the SIBO, and then you can cycle off afterwards, as these bacteriocins may impact, if you get too much of them consistently, they can start hurting maybe some beneficial microbes, although that is not. Anyway, you just rotate off for a little bit, and you can refrigerate your batch for up to 2 to 3 weeks, and then refresh your starter every eight generations.

Anecdotal data showed that 90% of people using this yogurt normalized their breath test, the H2 test, and they had symptom relief, and it outperformed the antibiotic rifaximin that GI docs often go to. It outperformed rifaximin, which has a 50% rate of cure. Also, in patients who were treated with rifaximin, their SIBO may initially resolve, but it often recurs. While taking this yogurt, it does not recur. Studies are not long-term yet.

Also, just to mention, the study was only 30 participants, which is a good starting point, but it is still not a huge study. I think in terms of saying a 90% chance of normalizing it, it would be great to see a bigger study.

They are doing ongoing trials.

Which I think is great. I will also say for a lot of people who are struggling with SIBO and maybe have tried rifaximin, or if you are even in the category where you are like, "I'm gonna be trying the rifaximin, but I know I only have a 50/50 shot," maybe I will add to this so that it increases my chances. If you look at risk versus benefit, a low risk profile with this, as long as you are making it correctly. If there is a possible improvement, again, this was a very small study. A double-blinded, very large study would be even more reassuring, but it is another tool in the toolbox to at least try.

Plus, a very good side effect of taking this yogurt is that it increases your collagen production in the epidermis so that your skin has a thicker collagen content, which helps with wrinkles, ladies. It helps with weight loss, better sleep, reduced bloating, and an overall sense of well-being. One of the interesting findings is that this yogurt with Lactobacillus reuteri helps increase your oxytocin release.

Remember, oxytocin in childbirth is a hormone and brain chemical made in the hypothalamus and released by your pituitary gland. Still, it helps to trigger uterine contractions during labor and supports your milk letdown during breastfeeding. It also plays a role in bonding, in bonding relationships, which makes sense with the mother and the baby at delivery.

It plays a role in trust and social connections, so it's called the love hormone. It is true that it really does improve your overall social connections. It has that brain effect, acting as a chemical messenger involved in bonding and attachment, and relieves some stress and anxiety. That is why it is called the love hormone, because the nickname comes from its links to affection and bonding, parent-infant bonding, and social behaviors.

They have actually studied oxytocin for autism patients just because of the social aspect.

That's interesting. Did it have a good effect?

For some of them. It is very new. They are still studying it, but it is because of the social aspect.

Dr. Davis's Homemade SIBO Yogurt Recipe And Its Benefits

It's worth a try, too. We know that magnesium-rich foods like spinach, almonds, dark chocolate, and probiotics in this yogurt and in kefir support these oxytocin pathways via the gut-brain axis and links. We see some benefit from vitamin C sources and omega-3s in producing this. Dr. Davis's yogurt recipe is high in this particular bacteria that I mentioned, *Lactobacillus reuteri*, and the probiotics in his homemade yogurt help to correct small bowel overgrowth or abnormal bacterial overgrowth in the upper intestinal tract. That is why it is so important, because most of the probiotics we take just hit the lower intestinal tract, not the small bowel.

We had talked about it before, but just to remind people, you have your small intestine and your large intestine, the colon. The small intestine is broken up into these three parts, and so that's where it can be hard, really for especially for a small intestinal bacterial overgrowth, to get treatment where it needs to go. Even when you were doing it, we had talked about how one of the ways you can diagnose SIBO was with an endoscopy, and even in the endoscopy, there are some cases where they can go a little bit further, but typically, they can only get to that first part of the small intestine.

That is a limit there. He also goes into the book all these diseases associated with SIBO, which include rosacea, a lot of dermatologic rashes and diseases, and atrial fibrillation. I did not know that SIBO could be a trigger or related to AFib. Also, restless leg syndrome, where you feel like you have to always move your legs.

I will say that makes sense in terms of whether you can get all these nutritional deficiencies.

The iron deficiency could be. That is what I was thinking too, because restless leg syndrome can improve when you normalize your iron deficiency, B vitamins, and other things. Also, SIBO is related to dementia, as this causes blood-brain barrier leakage and increases your amyloid beta and tau proteins. Those are the inflammatory proteins seen in Alzheimer's, and it is associated with fatty liver disorders, metabolic dysbiosis, and increase the release of bacterial toxins like LPS, increasing your intestinal permeability, as measured by zonulin.

Also, when you have SIBO from taking a PPI, he found out in this research that PPIs not only decrease your protection, your acid from harmful bacteria in your intestinal tract, but PPIs also allow bad bacteria to descend from the mouth flora and bad bacteria to ascend from the lower intestinal tract, and then cause all of these bad bacteria to reside in the small bowel.

Some people do really need to be on these PPIs, but I think then it is good to be aware of this because you can be more aggressive in terms of diet, trying to make interventions that really put back in good bacteria and trying to counteract some of those issues that can come from that. Another thing that would be important to talk about is how the gut can affect allergies. Allergies are skyrocketing now. I feel like it is quite wild, and I do think that there is a big part of the gut relationship with that that we do not quite understand, and I am sure we are going to learn more about it. What do you think in terms of what we know right now, how the gut affects allergies?

We know that so much of our immune system lies in the intestinal tract. When you get a disruption of the normal gut microbiome population and have more gut dysbiosis and leaky gut, that is a trigger, we are finding out for allergies. The connection between gut health and allergies might seem surprising, but it is one of the most important pieces of the allergy puzzle we are finding out.

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“So much of our immune system lives in the **intestinal tract**. When the gut microbiome is disrupted—**leading to dysbiosis and leaky gut**—it becomes a trigger for disease and inflammation.”



Karen McCarthy

The Ultimate Gut Health Reset: Detox Toxins, Conquer SIBO/SIFO, And Optimize Your Microbiome [Part 3] With Dr. Karen McCarthy

This research, published in the National Institutes of Health, says that approximately 70% to 80% of your immune system resides in your gut. That is quite a bit. This means the health of your digestive system directly influences how your immune system responds to everything, including your seasonal allergens. When your gut barrier becomes compromised, sometimes referred to as leaky gut or intestinal permeability, it allows partially digested food particles, toxins, and other substances to escape into your bloodstream, which we have already discussed. Your immune system recognizes these as foreign invaders and mounts an inflammatory response.

Over time, this creates a state of chronic low-grade inflammation that leaves your immune system on overdrive, overactive, and hypervigilant. The gut health and allergen connection operates through several mechanisms, but your gut microbiome, the trillions of bacteria living in your digestive tract, plays a crucial role in training your immune system to distinguish between genuine threats and harmless substances. When this bacterial community becomes imbalanced in gut dysbiosis, your immune system loses its ability to respond appropriately. It loses its discernment, if you will, and instead of ignoring benign triggers like pollen, it launches a full-scale allergic response. That is something new, too.

I honestly think that there is going to be more that we find out about this.

The histamine release.

Again, the body is a whole. I do not think you can say, "The gut is the only part of this." I just think that it probably does play a part and that we do not fully understand that. We will learn more about it.

At least we would say it interferes with the normal regulation of your immune system.

We have discussed the importance of short-chain fatty acids a little bit, especially in the first episode, but I thought that we would maybe go into that a little bit more, especially butyrate.

It's because butyrate is a beauty.

Also, just to recap, where short-chain fatty acids come from.

Short Chain Fatty Acid (Butyrate) Protection Against Cancer And Metabolic Dysfunction

That will be good, and we can do it with this butyrate. Butyrate, remember, is a short-chain fatty acid produced when gut bacteria ferment dietary fiber. The healthier your gut flora, the more butyrate you will produce. This butyrate provides energy for your colon cells and offers health benefits beyond basic nutrition. Research suggests that butyrate helps manage these inflammatory bowel diseases by reducing inflammation and strengthening gut integrity from leaky gut. Our lab studies show that butyrate helps inhibit cancer cells in the intestinal tract, inhibits cancer cell growth, and triggers cell death in colorectal cancer cells.

Interesting clinical trials are being done with butyrate. Butyrate, of course, has been shown to improve insulin sensitivity and glucose metabolism for metabolic disorders, and it influences appetite-regulating hormones like GLP-1. That is a natural hormone in your body, and butyrate helps to influence the amount of that hormone. Studies show that butyrate protects against neurodegenerative diseases by reducing brain inflammation and enhancing neuronal repair and survival.

Human metabolism evolved around the butyrate GLP-1 connection long before pharmaceutical companies developed GLP-1 agonists like Ozempic. Our ancestors ate diverse foods, which is the key,

like you mentioned, diverse plant fibers that fed gut microbiomes, which turned out and churned out high amounts of butyrate. That butyrate kept the intestinal barrier strong, inflammation low, and appetite hormones imbalanced.

It caused the appropriate satiety when you had a big meal. Today, processed foods and industrial cereals, especially vegetable oils that are high in linoleic acid, break that cycle and damage gut bacteria/butyrate output and disable something called the L cells that are responsible for natural GLP-1 production. Could that be a reason why we have so many people who are overweight? They do not have this balance.

I could definitely see how that would contribute because if you think about a regular bag of chips, you are going to get all the seed oils, plus you are going to have all of the bioengineered chemicals that they are putting into it to try to increase the dopamine, so that then you are addicted to them. Not only are you going to mess with this whole process that tells you you are full via the GLP-1 system, where it is decreasing your body's actual natural ability, but you are also having them mess with your brain from what they are putting in the food to tell you, "You need more of this dopamine hit." You are getting it in two ways. You are not full, you are super hungry, and you need to keep eating this.

You get people who are tired, inflamed, and overweight. Butyrate nourishes, as I mentioned, these L cells in your intestinal lining, the same cells that release the GLP-1 hormone after you eat a meal. When butyrate is abundant, this GLP-1 hormone works the way nature intended. The GLP-1 agonists, even the pharmaceutical ones, work by slowing gastric emptying so you have early satiety. You feel full longer, for a longer period of time after eating. It reduces glucagon, which lowers blood sugar. It enhances insulin sensitivity and helps your body burn fat.

It sends satiety signals to your brain, which, as you just mentioned, curbs your cravings and emotional eating. We know that butyrate has been linked to so many health benefits in supporting the integrity of the gut lining, getting rid of bad bacteria, fighting cancer, reducing inflammation, and protecting against obesity and diabetes. Because it can also function as a prebiotic in helping beneficial bacteria thrive, recent studies have linked an abundance of butyrate-producing bacteria with reduced bone fractures and hospitalizations for infectious disease.

Butyrate, that is pretty significant. They did not go into that study if the bone fractures were from having osteoporosis due to poor diet and gut health. It wouldn't surprise me if that is how it reduces it, butyrate. Microbes in your colon can convert the amino acid tryptophan, which is in your turkey, into a chemical that makes you sleepy. Also, it is found in animal-based foods. Microbes in this colon can convert that tryptophan into neurotransmitters like serotonin and melatonin.

The enteric nervous system in your gut, this nervous system around the gut, is immense, and the gut-brain axis has become a very fertile area of research. Lesser-known tryptophan metabolites like indole-3-propionic acid have been linked to benefits like fortifying the gut bacteria, promoting the release of GLP-1 peptide, reducing appetite, and protecting your liver from hepatitis.

It is interesting. Almost 90% of your body's serotonin is actually made in the gut. People do not realize that, and that plays a huge function in so many things. Not only is your melatonin production, but serotonin on its own is for so much.

We know that butyrate is also your primary energy source for your colon cells and these colonocytes that line your colon. It provides up to 70% of their energy needs, and its benefits go far beyond just fueling those cells. It also reduces inflammation and improves your immune system. Individuals with this inflammatory bowel disease often experience a double hit because they have a decline in butyrate-producing microbes, and they have a diminished ability to utilize butyrate effectively for all of its benefits.

Tweet: Butyrate is the primary energy source for colon cells (colonocytes), providing up to 70% of their energy needs. Its benefits extend beyond fueling these cells—it also reduces inflammation and supports immune function.

They also have reduced expression of butyrate receptors in the colon, which hampers the butyrate uptake and causes more inflammatory cytokines like tumor necrosis factor, and reduces butyrate oxidation. There are a lot of problems that you see related to this decreased butyrate production and its use appropriately in people with ankylosing spondylitis. It has been shown, interestingly, though, to inhibit the growth of cancer cells and triggers apoptosis or programmed cell death of cancer cells, helping to stop cancer cells from multiplying.

Butyrate's ability to affect gene expression in cancer cells works by specifically turning off genes that promote cell growth and turning on genes that promote cell death. It has an epigenetic effect there. Butyrate is also an effective complementary agent in cancer therapy because its ability to enhance the efficacy of chemotherapy and radiation therapy has been documented in preclinical models. Butyrate improves how your body responds to insulin and regulates sugar, metabolism, and mitochondrial function. It really is coming out to be more than just another short-chain fatty acid. I think it is a super duper one that will really help us.

For people who have been diagnosed with cancer or have overcome cancer in the past, the diet relationship to treatment is something that a lot of people are very interested in and that we are learning more about. Even the New England Journal of Medicine just had an article that came out on diet and different cancer treatments and outcomes, and how sometimes they can be helpful as an adjunct. There is so much to learn, but you do wonder if some of that has to do with the butyrate and all this healthy bacteria and setting up your gut. If it has an effect, I think it is something that we will definitely learn more about.

It is important to know about because if you have a low concentration of butyrate from an unhealthy diet and unhealthy gut flora, if you look at it with a low concentration of butyrate, then you lose that protection, and you are more likely to develop cancer.

A healthy diet decreases inflammation. Inflammation also plays a role in that. There are so many different factors. Something else to get into, because obviously, at Duration Wellness, we are very big on sleep. Sleep affects so much. If you are sleep deficient, it drives inflammation, drives cardiovascular risk, drives diabetes, pre-diabetes, and insulin resistance. I could just keep going with the whole list in terms of how important sleep is, which is the whole reason why we developed Sleep Club. We should also definitely talk about probiotics and gut health, and the effects on sleep.

Probiotics, Gut Health, And The Gaba Glutamate System For Sleep

This is interesting because most of you may have heard, maybe not, about the GABA and glutamate system in our body. GABA and glutamate act like the brain's main brake and gas pedal for sleep. That is a good way to look at it. GABA for sleep and glutamate for wakefulness. GABA is our main inhibitory neurotransmitter and generally promotes sleep, sedation, and sleep maintenance. Glutamate is the main excitatory neurotransmitter, which supports wakefulness and arousal, and can be a big troublemaker if you have too much of it when you are ready to go to sleep.

Sleep is not just about more GABA or less glutamate. It also depends on the right balance and the timing of both systems across your sleep-wake cycle. The best way to support the relaxing, sleep-promoting GABA is with food-based prebiotics taken at the right time, which is at bedtime. Those are prebiotics, as we discussed. Inulin and fructooligosaccharides, and Aspergillus-derived

enzymes. Basically, these prebiotics increase your brain GABA, and then this homocarnosine compound protects and stabilizes brain function.

GABA is good for going to sleep. Glutamate is not good. Your prebiotics help your GABA production increase when you want to go to sleep, rest, and get a good night's sleep. We know that specific gut bacteria, such as Akkermansia and Parabacteroides, were directly linked to higher GABA concentrations, and prebiotic foods that specifically support GABA-producing bacteria are your bananas, asparagus, garlic, and leeks. Fermented foods like kimchi, kefir, and miso also contain small but meaningful amounts of GABA. I remember always eating a banana before I went to bed. Now I do not do it because I do time-restricted eating.

People need to know that they can have those effects. I will have the caveat that we do know that the later that you eat, your gut also has a circadian rhythm, and so you are not supposed to eat very late at night, which can actually interrupt your sleep. Having these at dinner time, a few hours before you are going to go to bed, probably with the recommendation not that somebody would have a banana right before they go to sleep, but maybe at dinner time, a few hours before you are going to bed, just because again, late-night snacking is actually a reason that people can sometimes have decreased sleep quality. The body is a whole, and there are so many factors.

Other supplements that may help are L-theanine, magnesium, and ashwagandha. They boost your GABA activity, and they also help to decrease your cortisol, your stress hormone that a lot of the time is on overdrive when we want to go to sleep. They have also been shown to help and improve sleep.

Which is why that is actually the L-theanine and the magnesium are also in the Sleep Club, because of all the findings with that, trying to help your body get into that relaxed state is a big part of sleeping well.

Lowering that cortisol. Sometimes women will find natural progesterone, micronized progesterone, helpful also to lower the cortisol level, the stress hormone, but if that is elevated when we are in this hyper-arousal state, like we discussed in our first episode, it is difficult to get to sleep.

In our society, it is very common to go-go-go. You have 10 million things to do, and then a lot of times, the only time that people are processing their day is when they are actually trying to go to sleep, and that is not the time to do it. That is like the last time you want to be doing that. You are thinking back to, "I forgot this," your stress level starts increasing, and it can just be this vicious cycle.

That is why the cognitive shuffling that we discussed in the earlier episodes helps, where you take a word, say, like "barn." "Barn" begins with B, then you think of all the nouns that begin with B, and while you are thinking of that noun that begins with a B, like bat, you are going to visualize a bat also, and put it under that B category. When you run out of nouns for B, then you go to the next letter for "barn" is A, and you think of all the nouns that begin with A, and usually by the time you are on the third letter, this cognitive shuffling has rebooted your thoughts, so you are not stressing out about what you forgot to do today and what you have got to do tomorrow. It just puts them in a category of focus, so you get sleep.

Your brain is not racing as much. Sleep is very complex. There are so many factors. We are mostly focusing on the gut part here, but supporting it with L-theanine and magnesium can help a lot of these people who have this overstressed, cortisol-increased state that can be affecting it.

The other interesting thing that I started using, as we use for CPAP machines, are these chin guards, I guess you could call them, but basically you wear them. They look like you are going to wrestle somebody, but they basically keep their mouth shut, so when you are sleeping. When you sleep with an open mouth, that can be a trigger to wake you up because it startles your body with the open

mouth and the dry mouth, and it stimulates your sympathetic nervous system and your stress hormones, and so you wake up often through the night because of this dry mouth. Just having it here and making sure your nares are clear for breathing through your nose has also been beneficial for sleep, too.

I wonder if some of that is. Some people have undiagnosed sleep apnea, and so sometimes just having that little bit of pressure in some of the systems can help. A side note, when you are sleeping with an open mouth, that is not good for your oral microbiome. It actually is a driver of all of the bad bacteria in your mouth.

Causing all those bad problems.

Which then can cause all the issues downstream with your gut. That is another way that can affect at least the gut process of sleep and everything.

It's very true.

This was so interesting. We covered a lot.

We did.

As always, this is not medical advice. This is just for educational purposes only. This was a fun series. I'm sure it's just the tip of the iceberg. There is more and more that is coming out every day.

We basically have 54 pages of notes, and you could have had triple that.

I hope you enjoyed it, and I hope you come back for another episode. Bye.

Important Links

- [Dr. Karen McCarthy on LinkedIn](#)
- [Wheat Belly](#)

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The New England Journal of Medicine. 2016. Lynch SV, Pedersen O.

Topic: Gut microbiome in human health and disease

Scope: Development, dysbiosis, mechanisms, and therapies

Summary

Narrative review of the human intestinal microbiome describes how gut microbes change across the lifespan, what shapes them, and how altered Microbial communities are linked to many diseases. The review highlights a few clinically relevant examples, especially fecal microbiota transplantation for recurrent *Clostridium difficile* infection, but emphasizes that most microbiome evidence is still correlative or preclinical and not yet ready to establish cause-and-effect for routine care.

Research in Context

- 2016 NEJM review: foundational synthesis of then-emerging evidence on intestinal microbiome roles in health/disease
- Subsequent literature: strong validation and extension; shift from association studies toward mechanistic precision (species/metabolites/pathways) alongside exponential publication growth
- Clinical translation: accelerated to FDA-approved fecal microbiota transplant products for recurrent *C difficile* by 2023; expanding microbiome therapeutics and efforts to address interindividual variability/standardization

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