

THE Duration *Wellness* SHOW

The Gut Health Revolution: Unmasking Hidden Toxins, Cancer Risk, And The Power of Your Microbiome [Part 2]

with Dr. Karen McCarthy

Most people think of gut health only in terms of digestion, but the conversation has radically changed. In this episode of our gut health series, we welcome board-certified internal medicine specialist [Dr. Karen McCarthy](#) to unpack the latest research. We dive deep into why your gut is the epicenter of your health—influencing everything from your mood and cognition to your cardiovascular health and cancer risk. Discover the shocking truth about modern toxins like microplastics, emulsifiers, and genetically modified wheat, and learn Dr. McCarthy's best diet strategies (hint: the Mediterranean diet still leads the pack) for restoring a diverse and resilient gut microbiome. Start reading to find out how to defend your gut barrier and transform your whole-body health.

Watch the episode here

```
<iframe width="560" height="315"
src="https://www.youtube.com/embed/WzI3obJgwVk?list=PLUuCg7Q6F
WeiWH4NB3dFTe5Px9K1si_rR" title="" frameborder="0"
allow="accelerometer; autoplay; clipboard-write;
encrypted-media; gyroscope; picture-in-picture; web-share"
referrerpolicy="strict-origin-when-cross-origin"
allowfullscreen></iframe>
```

Listen to the podcast here

```
<script async
src="https://player.podetize.com/loadShowcasePlayer.js"
data="Jaoj4CFai" epmode="true" id="showcase-player"></script>
```

```
<iframe
src="https://player.podetize.com/?id=Jaoj4CFai&epmode=true"
width="100%" height="200" frameborder="0" title="ShowCastR™
player"></iframe>
```

The Gut Health Revolution: Unmasking Hidden Toxins, Cancer Risk, And The Power of Your Microbiome [Part 2] With Dr. Karen McCarthy

We are back for another episode in our series on gut health. With me is [Dr. McCarthy](#). She has decades of experience in internal medicine and is board-certified. She still volunteers and runs the [City Rescue Mission](#) clinic, so she is still practicing. She's been with us on a few other episodes, and we're back in this gut health series. Welcome.

Thank you. It is so good to be here.

I thought maybe we'd start off with a recap on a little bit of the overall gut health that we talked about in the first episode of the series.

Probiotics Prebiotics And Postbiotics Definitions

That's a wise idea. We covered a lot of ground in the first episode, so I would encourage the audience to maybe review that one also. A healthy gut usually means your digestive system is functioning normally, and your gut microbiome is in a balanced state. That's a little encapsulated definition. We know that probiotics are live microorganisms, usually bacteria or yeast, that can provide health benefits when taken in adequate amounts. They are often found in fermented foods or supplements. Some strains may help support digestion and reduce certain GI symptoms.

We also learned about prebiotics, which are your fiber foods, like inulin and other non-digestible fibers that feed the beneficial gut microbiome. They're helpful bacteria to grow. Those helpful bacteria grow and produce beneficial compounds, which are the short-chain fatty acids we briefly discussed in the first episode. There's probiotics, and then there's the fertilizer for the probiotics. That's called the prebiotics. That's your high fiber foods.

THE
Duration
Wellness
SHOW



"Dr. Karen McCarthy is an esteemed, board-certified internal medicine specialist who brings decades of clinical wisdom to the table, coupled with a genuine commitment to service through her continued work volunteering at the City Rescue Mission clinic."

The third one we discuss is postbiotics. This is fairly new. Postbiotics are the beneficial compounds that are made from healthy gut bacteria as they break down their prebiotics and metabolize that food. Postbiotics include these short-chain fatty acids that are produced, such as butyrate and other bioactive substances, that help to support the gut barrier so you don't get leaky gut. They reduce inflammation.

We got probiotics, prebiotics, the fertilizer for the good probiotics or good bacteria, and then the postbiotics, which are a byproduct of having a healthy gut with healthy gut microbiomes. A simple way I said last time, to remember, is probiotics are the live workers, prebiotics are their food, and postbiotics are some of the useful products that they make. They're all important with good gut health. With probiotics, we went over kimchi, kefir, yogurts with live culture, sauerkraut, miso, tempeh, Kombucha, some cheeses, and fermented pickles. We went over the prebiotics, which are high-fiber foods. That was a foundational block for developing on with this gut health.

Tweet: Probiotics are the live workers, prebiotics are their food, and postbiotics are the useful compounds they produce. All three play an important role in good gut health.

To get further into this episode, one thing that would be helpful to go over is that I'm sure a lot of people read the first episode and were like, "I'm worried I have gut dysbiosis, meaning that my gut is out of whack. The bacteria are out of whack." What is the best diet? We talked about fermented foods and high fiber, but overall, the best diet for restoring a healthy gut microbiome.

Mediterranean Diet For Gut Health And Diversity

This is interesting because I'm sure you have all heard about the Mediterranean diet. That still leads the pack for the best diet to restore normal gut function.

That is so interesting to me because it is also the leading diet for cardiovascular health, too.

They're related. The Mediterranean diet, though, continues to dominate. It's not a trend. It's the most consistently validated dietary pattern for our microbiome health. It does include fermented foods and high fiber. This diet is rich in fruits, vegetables, legumes, whole grains, and healthy fats. That type of diet increases not only the good bacteria population, but also the diversity of the good bacteria. You want a lot of diverse bacteria in there, and this Mediterranean diet does create that state. Also, we see higher levels of short-chain fatty acids production and reduced markers of systemic inflammation when someone is on the Mediterranean diet.

They had this study in 2020 in the Gut Journal, which found that adherence to a Mediterranean-style diet among older adults led to microbiome shifts linked to reduced frailty and improved cognitive function. That's a biggie. One of the more nuanced discussions centered on the plant food matrix, the idea that nutrients in whole plants don't act in isolation, but they act in unison.

Sometimes, it's taking a little supplement that may be an isolated benefit of a food, like something with polyphenols. You try to take a polyphenol supplement. It's not as beneficial as God has designed it in this matrix for best absorption and assimilation in your diet. That's a new thing, too, on that research. It's not just fiber. It's how fiber, polyphenols, and all of these nutrients interact within whole foods to shape your microbiome system.

In 2019, a cell host and microbe study showed that dietary diversity predicts microbiome stability more strongly than individual nutrients alone. Polyphenol-rich foods have been shown to modulate microbial composition and reduce something called oxidative stress. Oxidative stress occurs when there's a lot of stress on your body, and you develop free radicals, which can be so harmful to your body. Having polyphenols in the whole food was very beneficial for reducing that.

Fiber fermentation produces butyrate and improves gut integrity. Inflammation is decreased, insulin sensitivity is improved, and metabolites that affect our mood and cognition are improved. It goes on and on. We're finding out that eating real food, not ultra-processed food, going back to the basics, is the best way to get healthy and restored.

Sometimes, people get a little overwhelmed as they learn more about this, in terms of trying to increase the diversity of the plants. Something I always tell people that I think is very helpful is that even different colors of the same plant help with that diversity. If you think about going to get a bag of rainbow carrots, which have purple carrots, yellow carrots, and orange carrots, those all have diversity in them. Even though they're all carrots, they all have different products in them. They're helping in terms of this diversity.

Even with sweet potatoes, let's say you get an orange sweet potato, but then you also get purple sweet potatoes. That's diversity. Those are all part of that. It's a lot easier than people realize. You have to think about it a little bit more. There are a lot of options out there. A carrot is a carrot, but the purple carrot is different than the orange carrot. That helps in terms of the diversity, which is helpful.

Fecal Transplant Concept And Applications

Good advice. That's so true. If you get the whole food, it's the best way to eat, as well as organic. I know people have probably read about fecal transplant. That's where you get another donor's stool, and then it's introduced into your body. That is supposed to restore gut health, but it doesn't. It has been shown to help with C. diff, *Clostridioides difficile*, a bad bacterium that can cause chronic diarrhea and a horrible health state.

It is an interesting concept. Probably a lot of people have not heard of it because it seems quite wild. You're taking a pill of somebody else's poop. That's what it is. The thought is that you're trying to implement what's going on in their gut microbiome within yours. It does help significantly for some of these refractory cases. We call it a C. difficile or *Clostridioides difficile*.

These very bad bacteria overgrow in your system. That can be dangerous. People are hospitalized for it. I see people in the hospital all the time for it. It can be life-threatening, especially in refractory cases, meaning that they've failed the regular treatment. This is one of the next steps. When they fail all these other treatments that we usually do, then they do this fecal transplant. In those settings, it can be very helpful. I could see where it could maybe help in these other instances, too.

The individual who is the donor could introduce more health issues and diseases. They have had some deaths from fecal transplants.

If you're taking the stool from somebody who's very healthy, a lot of times, there is that benefit, but how are you finding that individual? How are you measuring that?

They don't screen them, as far as I know, too much. That was the study, too, for obesity treatment. It was an animal study of mice. They took the stool of skinny mice and put it in the stool of obese mice. The obese mice became skinny. When they went in the other direction, the skinny mice, when they got the obese mice's stool, became fat.

It shows that it is a reflection of the person's gut microbiome. They also have some studies of people who have been refractory to depression. They've taken the stool from people who aren't depressed, and then it helps. Granted, the effects are not long-lasting, which goes into how the gut plays such a big role. This would temporarily fix their gut if they're not making other changes. The body is a whole. It's part of this. It's an interesting concept.

Vitamin D And B Vitamins Role In Gut Health

A good gut-friendly dietary pattern looks like the multicolored, diverse plant intake, whole foods, minimally processed food, and balanced macronutrients. Another interesting fact in looking at this is the 75% of people with irritable bowel syndrome, which is a GI disease where you get bloating after you eat. You can get constipation and diarrhea. Alternating constipation and diarrhea is a miserable chronic state to have.

“A gut-friendly dietary pattern includes a diverse range of colorful plant foods, whole foods, minimally processed ingredients, and balanced macronutrients.”

Dr. Karen McCarthy

The Gut Health Revolution: Unmasking Hidden Toxins, Cancer Risk, And The Power of Your Microbiome [Part 2]

Seventy-five percent of them had insufficient levels of vitamin D. About 70% reported improvement in their IBS symptoms when they took vitamin D supplements. Another point of nutrients, B vitamins, and vitamin D on gut health. We also had a study on taking thiamine for chronic constipation. It was significant. I'd go into that in one of these series that we're doing.

It's another factor of how our body is a whole. There's so much in terms of different effects that if you're deficient in some nutrients, how can it be a big factor? Vitamin D is something that you can easily get tested for. People can see if they're low and then get treatment for it.

Another point is that food is medicine. With good food, you have good health.

Another aspect that I wanted to talk about is that it's more common to hear that people are gluten-intolerant or gluten-sensitive, meaning that they can't tolerate gluten and wheat products very well. What do you think in terms of gluten and wheat causing gut dysbiosis and leaky gut?

Modified Wheat And Wheat Germ Agglutinin Toxicity

I think it's a very important association. We know people who have tried gluten-free diets or decreasing gluten have had benefits on their gut health, including weight loss. All these inflammatory conditions improve. In the 1960s, as I mentioned in the first episode, we know that wheat was bred to produce this short-stature wheat called dwarfed wheat. The purpose of it was that it would yield a bigger harvest.

In that dwarfed wheat that we started eating in the 1960s came a compound or chemical called amylopectin A. Amylopectin A in modified grains is quickly digested and quickly raises your glucose and insulin levels after eating it. There you go with the start of increased numbers of prediabetes and diabetes. This increases insulin resistance, and it can lead to diabetes and the elevation of these harmful small LDL particles. It's not so much your cholesterol, even your LDL levels, that are of importance in measuring. It's these small LDL particles that are big troublemakers in cardiovascular health.

Also, this dwarfed wheat contained wheat germ agglutinin. That's a modified wheat, also. This wheat germagglutinin is extremely inflammatory on the gut. It is a lectin found in wheat germ. They added this wheat germagglutinin to resist insects and molds, thereby yielding more wheat production. Their intent wasn't to hurt us, but they didn't study the effects on human health in modifying these grains for greater production.

The wheat germagglutinin in modified wheat is very toxic, though, and may be the biggest trigger for inflammation seen in ulcerative colitis and Crohn's. I had patients with those diseases where I would say, "Get off the gluten. For sure, it's worth a try." We know that wheat germagglutinin can bind to intestinal cells and cause leakage across the gut lining, increasing inflammation and leaky gut. The leaky gut causes endotoxins or bad toxins to be released into your blood, driving insulin resistance. It's that vicious cycle.

We already went over in the first episode about the leaky gut, which then can also affect the leaky brain. That can affect all of those neurodegenerative diseases.

We're seeing an increase in those, also.

GMO Foods BT Toxin And Toxic Food Dyes

Unfortunately, we are exposed to more things. We have a lot more toxins than we did many years ago. What are some other toxins that people should probably be aware of in terms of exposure that can affect the gut lining?

I went into a bit of this and researched it. There are so many chemicals that are manmade. There are different ways of modifying foods. We know that GMO foods, they contain the Bt toxin. I had never heard of it until I came across this in the research. Maybe farmers have. This Bt toxin is a built-in insecticide that works by imploding the stomach of the creature that's feasting on it. It could be significantly contributing to the inflammation in your gut.

The most commonly consumed GMO crops, which include both herbicide-resistant and Bt varieties, are corn, found in most processed foods in the form of corn meal, corn syrup, corn starch, and corn flour, and so on. This Bt toxin is in a lot of those products. It's also not only in corn, but in soy. A lot of times, they'll hide the description of it and say it's lecithin and starch, but it has that Bt toxin in it.

That's something for people to be aware of, too, because it's increasing. People have allergies in different forms. Some people will have a corn allergy. You almost wonder if it's an allergy to the Bt toxin, same with soy. They are in so many products. The soy lecithin, a lot of times, will be an emulsifier that they'll add to different things, even your chocolate. Most people probably wouldn't even realize that it's in chocolate, but if you get most chocolate chips, they're going to have that in them. It's in a lot of things.

It's hard to eliminate it all in the world we're in. Also, the other one was canola or rapeseed oil. That oil is very high in this Bt toxin, as well as potatoes. These Bt plants have been so genetically engineered that they're equipped with this gene from a soil bacterium, and then that allows the plant to produce Bt toxin internally. Plant-incorporated pesticides, such as Bt toxin, are registered with the EPA as a pesticide, but the Bt plant itself is not regulated. That's why they can say toxin-free, but it's not because they've incorporated it internally into the plant.

That has resulted in this false claim that Bt plants have reduced pesticide usage. They don't. Importantly, this Bt toxin in Bt plants does not degrade, nor can it be removed or cleaned off the food, because it's integrated into the cells of the Bt plants. The plant-produced version of the poison is also a thousand times more concentrated than the Bt topical spray.

That's wild.

You could see why it would be a very strong pro-inflammatory chemical, and could be a reason why we're having a lot of these inflammatory bowel diseases.

If you eat organic, does that mean that you're having those sorts of modified plants, or not necessarily, and it just means that you're not getting the spray?

Exactly. That's why try to stay away from corn, soy, canola oil, and potatoes. Those are plants that, even though they may not have been sprayed with Bt toxin spray, incorporate it into the plant itself.

That is wild because there's a lot of benefit from certain soy products, like tofu and even tempeh. That's the fermented soy product. There are a lot of health benefits there, too.

You could say these are soy products that feed the cows. I don't know. I'm not into all of that yet.

I would be interested to see. Maybe it is in all of them.

We know miso is a good fermented food, as well as tempeh.

Miso is great. It's also from soy. There are so many health benefits, even in decreasing estrogen. If you're more overweight, your fat cells make estrogen. You can be higher in estrogen, and that can be a driver of cancers. The phytoestrogens, which are in the soy products, help decrease that risk. There are a lot of benefits that we know.

We should look into that because I bet you the ones in Japan, like the miso, tempeh, and all those good fermentable foods for our gut, perhaps that soy plant is grown differently and doesn't have the Bt toxin in it. The soy plant is used for feeding cattle. I don't know.

I don't know either. It is something that I want to look into because I didn't know that.

It's especially a thousand times more concentrated if it's integrated into the plant.

That is wild. In recap, in avoiding processed foods, you're also going to decrease your level of getting this in all the emulsifiers and additives. If you're having regular corn on the cob, you're having some corn syrup. there. Many people don't realize that if they're getting processed foods, they're getting corn syrup. You're getting all these emulsifiers. It's the same with soy. There can be all these other derivatives that can end up increasing the amount of exposure, which are more harmful.

You never see corn with a label that says non-genetically modified or that does not have Bt toxin in it. Organic is best. Fresh is best, no pesticides, and keeping your vitamin D level above 60. This is new with this administration, with the food dyes in candy. Soft drinks and cereals have a red dye called Allura Red. That has been shown to increase your risk of Crohn's disease and other inflammatory bowel diseases.

Tweet: Organic is best. Fresh is best—no pesticides—and aim to keep your vitamin D levels above 60.

A lot of people try to downplay some of these food colorings and everything. We have some correlation data. It might not be causative, but enough to be like, "Why would you risk it?" Something else we should probably go over is a little bit about cleaning products. We have to use some cleaning products. Otherwise, your house will be disgusting. We have to use some. What do you know in terms of some of the cleaning products that we should probably try to avoid, which can affect gut health?

Triclosan Emulsifiers And Antibiotic Impact On Gut

Avoid any cleaning products that have triclosan in them. It's in most of our hands, so cleaning products. If you're in the hospital setting, a lot of times, they have you cleaning with some very toxic chemicals. These studies show that triclosin can cause a worsen colitis, predispose the individual to colon cancer, and increase the tumor necrosis factor.

The relationship to the microbiome was studied in controls in mice. There was such a difference between those who were treated with triclosin and those without. The ones that had the triclosan exposure, we saw that it inhibited the growth of beneficial bifidobacteria. Bifidobacteria are very healthy, important bacteria to have, and that was decreased by 30%. That led to inflammation.

With some of these chemicals, we're starting to find out they can compromise that tight junction and cause leaky gut and inflammation. Factors thought to play a role in rising inflammatory bowel disease, like ulcerative colitis and Crohn's, include antibiotics, toxic disposures from these pesticides, genetically modified foods, and processed food ingredients such as emulsifiers. Polysorbate 80 is a big one. Polysorbate 80 is an emulsifier, as well as carboxymethylcellulose.

A nice little app I do like is either the [Yuka](#) app or [the Bobby Approved](#) app. They're free. You can hit the QR code on the food in the store, and it will tell you if it's approved or not approved or whether it's healthy for you or not. It will tell you why it's not healthy. It's hard for you to memorize and know all of these chemicals. That's a good little tip for folks who want to keep toxin-free.

We do know that diets in wealthier countries often eat processed food that contains these toxic additives and emulsifiers. These additives are increasingly associated with inflammatory bowel diseases. This study was conducted by a group at France's National Institute of Health. They focused on one particular emulsifier. Emulsifiers thicken your food product. It's in a lot of processed foods to make them more palatable.

It can be a thickener, or it can make it taste smoother. It tries to make it taste better.

This one focused on one emulsifier called carboxymethylcellulose, which is commonly found in processed baked goods, processed cookies, cakes, sandwich bread, and ice cream. These emulsifiers are common additives that are found in mayonnaise, salad dressings, baked goods, and ice cream. They have been shown to cause colitis and increase inflammation. That's why we try to make our own salad dressing, thanks to you. We mix the honey with the Dijon mustard. It's quite good. We know that this particular one has been researched and has been proven, this carboxymethylcellulose and these processed foods, to wreak havoc and increase the inflammation in your gut.

We also know other toxins, like forever chemicals. We briefly discussed your PFAs, PolyFluoroAlkyl substances. That's why we abbreviate them, PFAs, or forever chemicals. They're in our makeup, our food packaging, our waterproof clothing, our fire retardants in clothing, furniture, carpet, nonstick cookware, groundwater, and firefighting foams. That is why we're seeing an increase in firemen and firewomen of developing colon cancer and other cancers. These PFAs, or forever chemicals, have spread throughout the atmosphere and into our brains. They're found in the blood of most Americans. They are around forever.

To go back, I think a little bit to the emulsifiers. It can get a little overwhelming. You listed off a bunch of different emulsifiers that can all cause issues. For most people, if you take a step back and think less ingredients, more real food, and more cooking at home, where you're making single-ingredient meals, that cuts most of this out.

Even if you can't afford organic, but you're at least rinsing and soaking your fruits, vegetables, and everything ahead of time. Baking soda can help even more. If you're rinsing that, then at least you're decreasing that. You can also do other things, like peeling your potatoes or carrots if you can't get organic. You can still try to be cost-effective, but still help with your health.

A lot of times, we try to have fast and convenient food, but there are other ways that we can do that, even with soups, meal prepping, and doable things. Going back to more single ingredients is the easiest way because it can get overwhelming to try to be like, "What ingredient is in this? What ingredient is in that?" If you're making broccoli, sweet potatoes, and fish, then you know that's three ingredients. There aren't any emulsifiers in there.

That's good advice. That's how it was centuries ago. We didn't see all these diseases. The other one is a big culprit, and I'm not labeling it as a man-made toxin because it has saved lives. We are seeing a lot of negative consequences from the overuse of these antibiotics. In one analysis, participants receiving 1 antibiotic course, or none, or a single course of 7 of 11 antibiotics, were associated with reduced gut microbiome diversity 4 to 8 years after taking the antibiotic. It's not just a short time period that messes up your gut flora. It can extend out to 4 to 7 years. They've even seen behavioral changes after taking antibiotics with mood disorders, increased anxiety, and so forth. It's all new here.

In contrast, several commonly used antibiotics were not associated with changes in gut diversity. That included extended spectrum penicillins, amoxicillin clavulanic acid, which is Augmentin, and sulfamethoxazole trimethoprim, which is Bactrim. Those were not too bad at messing up our gut diversities. An analysis of the gut bacterial abundance following antibiotic use revealed that the big culprits are the antibiotic clindamycin and the fluoroquinolones.

That makes sense because clindamycin used to be the biggest culprit for causing C. diff infection. We talked about it earlier about a bad bacterial overgrowth. This is important for people to know because there are times when you have to take antibiotics. It saves lives. Also, sometimes, a very bad bacterial infection can be detrimental to your health. My first thought comes to strep. Some of

these kids who get strep can get debilitating neurological issues from it, not to mention all the heart issues and so many other things that can come from it.

There are times when we have to take antibiotics. It has saved lives. Where it's important is that for a while, people used to think, "There's no downside to an antibiotic. My doctor's telling me this is probably viral, but I don't want to take that chance. I'm going to take an antibiotic anyway." Especially for ear infections, a lot of times, you can wait and see if it goes away for kids. Doctors get blamed a lot for all the antibiotic use, and we contribute, but a lot of times, patients are quite demanding, wanting an antibiotic.

They're like, "Give me an antibiotic."

It's good that people know more about this because then, there's less pressure to hand it out when it shouldn't be handed out, if that makes sense. There's the whole risk-benefit analysis that has to be discussed with the patient. It is very cool to see that some antibiotics don't have quite the same effect as other antibiotics. That's very interesting.

Postbiotics Butyrate Epigenetic Effect And Thiamine

The other thing is we already talked about the postbiotics, which are compounds that your good gut bacteria produce. They're doing research showing that postbiotics, the short-chain fatty acids, and so forth, can strengthen your gut barrier function, reduce inflammation, and selectively suppress harmful microbes, with the strongest benefits seen when the gut is already compromised.

These postbiotics can neutralize, in a way, the cellular damage caused by oxidative stress from all these toxins, antibiotics, and so forth. In a way, it can reduce that oxidative stress and help with the damaged cells by stealing electrons from healthy structures. It's a good counter. Healthy gut microbiomes are going to produce these postbiotics, which help to protect you from the toxic assaults on your gut. It neutralizes them.

Tweet: A healthy gut microbiome produces postbiotics that help protect the gut from toxic assaults.

With antimicrobial effects, we do see that they were selected, not broad-spectrum, certain postbiotic-derived products. This is a term I wasn't familiar with, but with postbiotic-derived products or bacteriocins, they've been finding out that they suppress specific harmful bacteria without wiping out beneficial microbes. The problem with antibiotics is that it not only targets the bad bacteria, but also wipe out the good bacteria.

These postbiotic-derived products or bacteriocins zoom in on the bad guys, like certain cancer agents will zoom in on the cancer cells. This is zooming in on the bad microbiomes causing the disease. This targeted action differed from antibiotics. Antibiotics disrupt the entire microbial communities, but postbiotics influence the balance rather than acting as a blunt microbial weapon. The strongest benefits appeared in tissues with barrier functions.

This was interesting for us. Beyond your gut, this study documented improved outcomes in skin wounds, atopic dermatitis or eczema, vaginal infections, and oral biofilms. These postbiotics are going to come into play here because they act through signaling, not colonization. Remember, they're a byproduct of a good, healthy gut. They interact with receptors on your cells, influencing your immune signaling systems and regulating gene expression linked to inflammation and repair. Instead of taking over your whole microbiome like antibiotics do, they act as messengers that nudge existing systems towards stability.

Whole foods and fermented foods support this continuous postbiotic production, which also supplies nutrients that supplements can't replicate. Remember, these postbiotics are not the bacteria. They're the compounds that good bacteria leave behind after their digestion. These include the short-chain fatty acids, such as acetate, butyrate, and propionate. These substances already exist inside you when your gut bacteria function properly.

Look at them as an outcome of good gut health rather than a replacement for it. They're going to come on the market with some super duper probiotic, but it's getting the whole gut microbiome healthy, and then it will do its own thing in producing these postbiotics. The distinction matters because supplement marketing often skips right past it. The real question isn't whether postbiotics do useful things in your body. We know they do. The question is whether buying them in a bottle makes sense when your gut can already produce them for free if you have healthy gut bacteria.

There are some studies using butyrate, and people with inflammatory bowel disease use this supplement because it feeds their colon cells. They're finding out that butyrate, that important small-chain fatty acid, reaches into the cell nucleus and influences genes to turn them on or off. Those are genes that influence the inflammation and cellular repair in your colon. I know that's the epigenetic effect where butyrate can influence your genes and turn them on and off. They turn the good ones on and the bad ones off. They're doing a lot of research on butyrate, that postbiotic, at least in inflammatory bowel disease.

I mentioned the other one was thiamine. The good bacteria in our gut require thiamine to help break down foods into butyrate, a beneficial metabolite for gut barrier support and also healthy gut motility. Butyrate increases your thiamine. Your thiamine, we're finding out, is very important for your normal gut motility, your peristaltic wave that moves food along in your intestinal tract.

This study showed that increased dietary vitamin B1, thiamine, is associated with a lower prevalence of constipation. When I have a patient with chronic constipation, I'm putting them on 100 milligrams of thiamine, and they have improvement along with the high fiber, magnesium, and other naturals. This thiamine does more than just fuel the cells. It also helps nerve communications, that enteric nervous system in your gut.

In the gut, the nerves in these intestinal walls sense when food stretches the intestine. Naturally, that is a trigger for this wave-like muscle movement, the peristaltic wave or peristalsis, that pushes our food along. Peristalsis depends on acetylcholine, a chemical messenger that tells the gut muscles when to contract. Thiamine is needed to make acetylcholine in the gut.

That makes sense. If you don't have enough of it, then it's not going to work well. I have not heard of that before. I feel like a lot of people struggle with chronic constipation. It's very common. Magnesium is starting to be understood more. People understand that if they're magnesium deficient, that can exacerbate the problem. I personally had not heard of thiamine before.

This is a new study. They did see that when the thiamine levels drop, gut cells can produce enough energy, impairing neural signaling and weakening muscle contractions. It slows the transit time in your gut. It's very important. We get 2 weeks of nutrition in medical school and 2 years of pharmacology. We need to be learning this. The new docs, the young doctors coming up, should be learning this because this is so important for our health.

Overall, supporting your gut environment through diet delivers steady, long-lasting benefits, while postbiotic supplements, like this butyrate, are also good additions. One other postbiotic supplement that they are working on is not the Akkermansia. We know the Akkermansia is a good gut bacterium,

but it's very hard to absorb and assimilate because it cannot be exposed to any oxygen at all. It's an obligate anaerobe.

They're using something called heat-killed Akkermansia. What is that? That is being looked at as a postbiotic Akkermansia supplement to prepare and help with diseases in the gut, especially the ones that have increased intestinal leaky gut. This mucosalate that lines the intestinal tract acts as a boundary between gut microbes, as we've been studying.

This research on Akkermansia focused on how this postbiotic type of heat-killed Akkermansia is also beneficial to allow your microbes to feed on and have your microbiome improve the thickness of that gut lining. They're using that in inflammatory bowel diseases, too. It's all new, but it is something that makes sense with these postbiotics, the butyrate, and this heat-killed Akkermansia, as possible benefits for the inflammation in the gut.

Gut Bacteria Colibactin And Cancer Risk

That's very interesting. There is another topic that would be interesting to go over. We're learning more about it. In the near future, we'll have a lot more information. It's not completely surprising given how an unhealthy gut drives inflammation, and inflammation can affect your cancer risk. What's the relationship between certain gut bacteria and cancer?

There's so much they're discovering here. An article research identified a subtype of E. coli. E. coli is the bacterium that also causes a lot of urinary tract infections and GI infections. They produce this colibactin. That is considered a mutagen associated with cancer. This E. coli produces this bad colibactin toxin that can trigger cancers. Early exposure increases the risk of developing cancer at a young age.

Of 981 colorectal cancer genomes, most carried mutations suggested a prior exposure to colibactin, a toxin produced by these E. coli strains. It's a gram-negative bacterium. Patients with extremely early onset colorectal cancer who were younger than 40 were 3 times more likely to have this colibactin mutation than patients older than 70.

Crucially, colonic exposure to colibactin from this bad bacteria E. coli was linked to adenomatous polyp formation and adenomatous polyp colon driver mutations. A lot is coming down the pipe with that. These findings suggest that colibactin-induced injury from this bad bacteria can accelerate cancer development in some individuals.

Environmental factors may contribute to the rise of early onset colorectal cancer, such as consuming red meats, because you get carcinogens, especially from grilling, processed meats, especially if you're a culprit, other processed foods, low fiber foods, lack of fruits and vegetables, drinking alcohol, lack of exercise, and colibactin exposure. They group them all together.

You have to look at it when you have an imbalance in your gut bacteria. It is already shown to be linked to colorectal cancer through mechanisms, like this gene toxicity changing the genes, inflammation, and oxidative stress, with specific bacteria such as Streptococcus bovis and Fusobacterium playing a central role. That fusiform bacteria, we'll go into a little bit later there.

People can read that and say, "What do I do about that?" The takeaway that I would take from that is that a healthy diet and high fiber, high probiotic, and prebiotic foods are going to help protect you from that. That would be the biggest way, not to try to limit known toxins. It is about limiting the alcohol, pesticide exposure, junk food, and all the processed emulsifiers.

This was in a study. Use of antibiotics may lead to an increased risk of colon cancer, especially ages less than 50. It was in an analysis of a large Scottish primary care database. It was especially increased in the proximal or the beginning part of your colon. Most of these colon cancers are in the distal part of your colon, like the rectal sigmoid area or the descending colon. These antibiotics, as we found out, can hurt not just the bad bacteria in your gut, but the good bacteria. That could explain this. We do see these gut microbes influencing genes and being cancer influencers.

Tweet: A study found that antibiotic use may be associated with an increased risk of colon cancer, particularly in individuals under the age of 50.

The gut microbiome is also known to be linked to colorectal cancer because of another bacterium called *Bacteroides fragilis*, which was found to cause colorectal cancer, but only in mouse models. They haven't had it yet for humans. While the inclusion of cancer on that list may seem odd at first, some researchers believe the gut microbiome might end up being a game-changer for not only cancer prevention but also treatment. It has been shown to help patients on chemotherapy or their cancer treatments. If you can get a lower chemo dosage or if it can do anything to improve that, that's very beneficial.

Even if you're able to feel a little bit better, so you can handle your chemo better. What can be a determining factor in treatment is whether people can handle the chemo.

We know that things like sugar feed the cancer cells. Diet for a healthy microbiome. Not only have gut bacteria been shown to influence gene expression, turning some genes on and off, that epigenetic effect, but there was research published in 2018 that found gut microbes control anti-tumor immune responses in your liver. It has also been found that antibiotics can alter the composition of immune cells in your liver, triggering tumor growth. Normal gut flora also improves cancer therapy and has antiviral benefits. Receding your gut with good bacteria is very important.

The one that I mentioned here, the *Bacteroides fragilis*, has conflicting research on it. Some said in the mouse models that it could maybe increase it, and then some said it prevents it. I would hold off on that until the research is in completely. I had noticed that when searching for that particular bacterium. Overall, the *Bacteroides fragilis* is supposed to be a good guy.

They had some other ones with an increased prevalence of *S. anginosus* bacteria and *Tannerella* bacteria, that is found in your dental plaques. Those *Actinomyces* and other bacteria in saliva can cause increased craving and consumption. We see more with alcohol consumption. The greater the alcohol consumption, the higher the amount of these bad guys. When these bad bacteria are in the mouth, it was associated with a high risk of esophageal cancer. Here, it's important for what's in your esophagus and lower intestinal tract. *Helicobacter pylori*, do you want to go into that, maybe?

Yeah, we can go into that. A lot of people have heard of *H. pylori*. Especially if you have acid reflux, and you go and get a scope, it's one of the tests that they do. There is a treatment, which is an antibiotic treatment, to try to get rid of it in terms of decreasing the acid. A lot more people probably have *H. pylori* than they even realize. We know that it can affect gastric cancer, and we have known that for a while. It goes along with how these bacteria can drive some cancer risks. That's one that we've known for a long time. Talk about that a little bit.

It's amazing. This *Helicobacter pylori* is associated with gastric cancer or stomach cancer. Chronic inflammation associated with *Helicobacter pylori* increases your risk for cancer, ulcers, iron deficiency, anemia, gas, and mucosa-associated lymphoid tissues or lymphomas. It can wreak havoc on your health. So that in and of itself, which we have known for a while, can cause this stomach

cancer. It's important to have that corrected if you are found to have *Helicobacter* overgrowth, to protect you against that.

We have enough evidence to show that this gut microbiome is so important to keep healthy because you see its effect on your cancer risk in these early studies. A good way for cancer prevention is a healthy diet with a healthy gut microbiome. In the series down the road, we can discuss some other significant toxins and how to maybe keep those out of our body for prevention, too, for cancer-causing triggers.

Microplastics Toxicity And Detoxification Strategies

That was a good overview of how gut health affects us in so many ways. Another topic that we should probably talk about, because we're exposed to so many more toxins, is talking about some of the toxins, their causes of inflammation, and what toxins we should look out for. I also think about microplastics. People are finally starting to realize how huge an issue microplastics are. When I was growing up, I never even thought about it. I used plastic for everything. My water bottle was plastic. I would get, especially in college, those microwavable meals. You microwave it all in plastic.

There were the Lunchables I used to give you.

We didn't know. People are starting to realize, "Microplastics have a lot of effects and a lot of these toxins." Let's start with microplastics and how that affects the gut. It used to be that people would be like, "We're finding these microplastics," and then there was an argument of, "It's not affecting you," but now we know better.

Remember that chart that I looked at? It showed from the 1960s this big surge in obesity and all kinds of diseases, diabetes, insulin resistance, hyperlipidemia, and cardiovascular disease. A big surge of it started and has been in continual elevation since the 1960s, when we started using a lot of plastics. When I grew up in the '50s as a child, we had glass. We had milk delivered in a glass like that.

You would get your food and stuff in glass bottles.

We hardly used plastic. It was healthier to use those products. Did you see that movie, *The Graduate*? It's all about plastics now and in the '60s era. With plastics, once they came on board and were used more and more frequently, we started seeing a lot of the negative health effects of them. They harm our gut mainly by disrupting our normal, healthy microbiome. They weaken the intestinal barrier, causing leaky gut, promoting inflammation, which then can affect digestion, our immunity, because we have a lot of immunologic cells in our gut, and even systemic disease risk.

How do they do this? How do they disrupt the gut microbiome? These microplastics and nanoplastics, smaller particles of plastics, can cause gut dysbiosis or bad bacteria overgrowth, shifting the balance away from these beneficial bacteria and increasing pro-inflammatory and pathogenic species. That can destabilize this whole microbial community in your gut.

Plastics act as ferry vehicles for pathogens and other toxic chemicals, like forever chemicals, phthalates, and BPA, which are endocrine disruptors. They then colonize the gut along with the plastic-bound hitchhikers, further messing up the composition of your gut microbiome and the function of your gut. The microplastics increase the leaky gut.

They destroy enterocytes or cells that cause the lining of your gut. They are altering these tight junction proteins. They suppress the mucus production, the protective mucus that you described. That allows for all these endotoxins and inflammatory molecules to then get into your bloodstream and wreak havoc on the rest of your health. We see that microplastics can heighten fat absorption and pro-inflammatory signaling. A chronic exposure has been shown to alter our immune cell function in the gut. That is a huge portion of the function of our gut in our intestinal tract, the immune system, including these macrophages and T cell differentiation.

Tweet: Microplastics may contribute to leaky gut by damaging enterocytes, the cells that form the lining of the gut.

Our killer T cells are cells that our immune system produces to gobble up and destroy bad toxins, bad viruses, and bad cancers. That is also altered by microplastics, worsening the inflammation and causing inflammatory bowel disease. Microplastics can translocate from the gut into your organs, like your liver, and into your blood. That can indirectly cause these problems with fatty liver and other liver diseases, the kidneys, and the brain. We have a teaspoon of microplastics in our brains.

That is wild. They find it in placentas and pretty much everywhere. It's crazy.

I'm sure that's causing some problems with an increase in neurodegenerative diseases. It's a big problem. It's important to find safe ways to get rid of it and avoid it. You discussed this in our dementia series. Safe ways to reduce microplastic exposure focus on cutting plastic where you eat and drink, like plastic cutting boards.

Use a bamboo cutting board or natural materials. Filter your water and your air. Most of these steps are low risk. They can be added gradually into your lifestyle, so do them as you can. Stop using plastic food containers and plastic bottles. Do not get water from plastic bottles, especially if it's sitting in the heat in your car. It's loaded with microplastics that get into your body and wreak havoc on your health. That's a simple one to change.

It can sometimes seem overwhelming, all of this. Sometimes, people also don't have the ability to go and buy all new things. When I talk to people about this, a lot of times, what I say is to start with the biggest things. One thing to go over is heat with plastic. It does not go well. You're going to get more of the microplastic exposure with that.

The areas to start off with are any of the kitchen cooking utensils. When I think back to college and even, honestly, medical school, what I would use was all plastic. I got these cute aqua blue plastic spatulas, which were horrible. You're using those all with the heat. Also, the non-stick cookware used to be the only cookware that you could find. That also has all these forever chemicals in it.

Your top things to hit are going to be all of this heat exposure. If you're limited by what you can do, what I would say is anything that's in contact with heat, like your cooking utensils and all that. Black plastic can be the worst offender. People don't realize. A lot of times, they'll say, "It's recycled. That's great. I'm being good for the environment." What you don't know is that a lot of the black plastics come from recycled electronics, which means that they have these fire retardants on them that are extremely toxic.

That has all the forever chemicals.

Not only are you getting the plastic part, but you're also getting all these other chemicals that were in it.

Do not microwave food with plastic in it.

People also don't realize that a lot of times, the to-go containers are those black plastic to-go containers.

It's terrible.

It can be overwhelming, but those are the biggest heavy hitters. That heat is breaking that down. Plus, those have even more chemicals than just the plastic alone.

Those are simple changes that can make a huge difference. I agree. We have to stop using these food containers that have plastic in the bottles, the wraps, and the storage. Use stainless steel, glass, and ceramic instead. Don't microwave with plastic containers or plastic coverings. Also, don't get popcorn that's in the popcorn bags.

Tweet: Simple changes can make a huge difference.

I used to do that all the time. Now that I know what's in the lining of the popcorn bags, no way. It's not worth it. Make your popcorn at home in a good old-fashioned stainless steel pot.

It is terrible. Even tea bags in our last series. Remember the plastic that's in your tea bag? The mesh, don't use that. Somebody suggested using a French press for your tea so you don't have to strain it.

You can use loose-leaf tea.

That would eliminate the plastic from a tea bag.

Coffee cups are another thing. People know at this point that your Starbucks with all the sugar is not healthy for you. People might say, "I'm just getting a black coffee from Starbucks." Even though it's a paper cup, the lining is plastic. The heat is the worst part because it's breaking down that plastic.

Even dishwashing plastics in your dishwasher release a lot of microplastics into the dishwasher, they found out.

Those pods are very common, which everybody uses. They put those pods in there. That has the plastic covering. What's happening is that it's getting broken down, and then it's going on to all your dishes and stuff.

Even if you have a plastic plate that you want to reuse and stick in the dishwasher, that releases so much. Avoid these single-use plastic bags and bottles. Carry a stainless steel or glass bottle and reusable cloth bags for your groceries and produce. Switch from plastic kitchenware to wood, bamboo, or metal utensils, cutting boards, and cookware.

Rinse your grains, meat, and fish, and wash produce well. Studies show that rinsing can cut microplastics served on rice and reduce surface-bound particles on animal food. Rinsing wouldn't hurt either. You want your water to be filtered with no microplastics. We use the reverse osmosis or a high-quality NSF-certified filter. Avoid anything in the heat there that's plastic.

Skip plastic pod coffee systems. Many paper tea bags are not paper tea bags. They have microplastics. Switch to the loose tea and a metal strainer or glass coffee setup. Thanks to Dr. McCarthy-Wells, we bought an expensive coffee maker that has no plastic. I had a very expensive coffee maker. I love my coffee in the morning. It had a reservoir where your water was put in a plastic container. It had a carafe that was stainless steel, so I thought it was fine. I looked at where the hot water comes out of, and it was all that black plastic.

I started using a French press, but I didn't want to continue using a French press. That's because if you don't have the brown filters in your coffee-making, then you get all of the negative lipid particles from your coffee oils that can raise your bad cholesterol or your LDL. We got this expensive one. It's made from all glass, this coffee maker, and stainless steel.

It's good that there are starting to be options out there. Also, for a more affordable option, there are glass pour-overs.

That's a good option.

There are a lot of very affordable stainless steel hot water kettles, or even old-fashioned stainless steel water kettles that you put on the stove. You pour that over the filter in with a glass carafe. No plastic there. You can find it very affordable. It's good to see that there are more options. As people are realizing the danger, that is driving consumer changes, which is cool to see.

I hope it does in some big companies that make workout clothes. Thanks to you, I also found a company that makes clothing that is not made with nylon and polyester. They have microplastics in them. They're horrible for the environment. They use materials that are safe for you, your health, and the environment. That would be your cotton, linen, and silk.

Also, wool.

That's right. That's very good. I don't use it here in Florida, but wool is very important, too. We sweat when we're working out. We have these sports bras, tops, and yoga pants that are all polyester microplastic-filled forever chemical clothing. It counters all you're doing. We think these companies that become these big companies that make this workout clothing would be aware of this and start shifting it.

I think it'll change. For people who are big sauna people, that is something to be aware of. You're going into the sauna. We talked about the heat. It's the worst part with the plastics because it increases the exposure. It's something to be aware of.

With clothing, I try to get it outside on our balcony in the fresh air. Try to line-dry your synthetic clothes when you can. Use a cold, gentle wash cycle because heat and friction from dryers and hot cycles increase the microplastic fiber shedding. Dust and vacuum regularly with a HEPA-type filter to reduce airborne microplastics that settle in your house on surfaces. Use fewer plastic-packaged cleaners, which we run into in cosmetics. Opt for bar soap, a safer choice, or a minimally plastic packaging product.

We talked about cleaners a little bit before, and sometimes some of the harmful chemicals that can be in them. One of the best cleaners that I use so much, which can be used for anything, is vinegar and baking soda. They're very affordable, not toxic, and are fantastic.

They work so well. There are more cleaning products coming out with different companies that have them be less toxic. The other thing is limiting shellfish. That was a bummer to me. I can't eat the high mercury fish because I have a high serum mercury, which I'm trying to key lay out with the protocol. The mercury is high because of a combination of amalgam fillings, silver fillings, and my high intake of mercury-rich fish.

I try to do a smash fish, which we discussed in our prior series, which are salmon, mackerel, anchovies, sardines, and herring as my fish product. My Omega-3 supplement is made from those types of fish because I don't want the high mercury. I would gravitate to some of these shellfish, thinking, "They're low in mercury." They found out that they're heavily contaminated. These bivalve

shellfish can be contaminated with microplastics because they concentrate them in high amounts. Everything we look at, we have to be careful.

Anthocyanins (C3G) In Foods For Fighting Microplastic Toxicity

I wanted to mention this research that has noted eating foods with anthocyanin and cyanidin 3 glucoside. I'm going to abbreviate that for you, which is C3G. Foods that are high in this anthocyanin, these purple fruits, have C3G in them. That's the colorant in fruits and flowers. That has been shown to significantly help mitigate microplastic risk. That purple sweet potato you were talking about.

When they looked into the role of these colorants in reducing microplastic and nanoplastic toxicity, C3G and these anthocyanins are a type of flavonoid that produces deeply pigmented colors, like these dark reds, purples, and blues in certain vegetables, fruits, and grains. It's helping people eat those rainbow foods because they're highly biologically active in a good way.

C3G, in particular, has been studied for its antioxidant, anti-inflammatory, neuroprotective, and hormone-modulating properties. It doesn't just neutralize these free radicals from oxidative stress. It interacts with steroid hormone receptors, like estrogen and androgen, and protects your reproductive tissues from these microplastics wreaking havoc on your fertility and reproductive function. When it comes to fighting microplastics and reducing that toxicity, these researchers discussed how this anthocyanin, the C3G, interacts with even these hormone receptors and helps improve fertility.

It is encouraging. A lot of people can hear about all these toxins and microplastics that we're exposed to and be like, "Why am I even learning about this? There's so much." There's a lot that you can do that is very helpful.

They're good-tasting foods.

I always say purple and blue are super good for you. They're very healthy. If you want to go over some of those.

The list is that are high in the C3G are blackberries, black currants, wild blueberries, purple sweet potatoes, which are very delicious, black rice, red cabbage, macaw berries, and purple corn. I've seen purple corn, but I've never tried it.

It used to be way more common. We went over how all the genetically modified things became more prevalent. It pushed out a lot of the purple corn. It's harder to find now.

These are very hopeful in trying to, in a way, eliminate some of this microplastic exposure. Although these foods won't turn your body into a filter for it all, it is a good way to fight back. These antioxidant-rich foods, like those with C3G in them, act like your body's cleanup crew in a way, sweeping away the microplastics and damaging toxins there. That was a good one. There are some others we can discuss.

What do you think about kimchi?

Kimchi Probiotic Strain Removing Nanoplastics

Kimchi is a good one, too, in the research. Researchers said this does exist. It's this Institute. It's called the World Institute of Kimchi. They did some research and identified a probiotic strain from kimchi. It's a good bacterial strain from kimchi that can help remove nanoplastics from the gut.

That's awesome.

I know, so eat that kimchi. I can't stand the taste of it. Not only is it good for your gut health and increasing the population of good bacteria, but it can also be a remover of microplastics in your gut. Rather than altering the microbiome in the usual way, this bacteria that's in kimchi physically binds to plastic particles, almost acting like a biological sponge to soak in and take away microplastics and reduce their availability in the intestinal tract.

Tweet: Eat kimchi. It supports gut health by increasing beneficial bacteria and may also help reduce microplastics in the gut.

The most consistent signals of microplastic and nanoplastic exposure in the body are inflammation, oxidative stress, and the endocrine effects because of microplastics. These BPA products have phthalates, which are what we call endocrine disruptors. They mess up your hormone system and your body. These particles may trigger the same pathways we already associate with chronic disease, these microplastics.

There are also early links to metabolic and cardiovascular outcomes with taking this kimchi, but the data isn't yet all out there. Additional research links microplastic and nanoplastic exposure with respiratory conditions like asthma, possibly lung cancer, gastrointestinal disorders, inflammatory bowel disease, neurologic disease, fatigue, dizziness, and general malaise. If you can have a food product like kimchi that specifically can bind out some of these microplastics, that's a good game-changer.

Let's go over how fiber, too, can help decrease some of the absorption. It creates a layer on the intestinal wall. A lot of times, it will trap some of those microplastics and nanoplastics. Now that they're finding out it does that, it's another reason why fiber is so important. In recap, what you start with is trying to limit your exposure. Limiting what is getting put into your body makes the biggest impact.

**“A healthy diet has
many beneficial
effects.”**

The Gut Health Revolution: Unmasking
Hidden Toxins, Cancer Risk, And The
Power of Your Microbiome [Part 2]

We start with heated things. That'll have the biggest plastic shedding. An air filter and a water filter are important for so many reasons. It's not just the microplastics, but also all the toxins with all the spraying and everything that goes on. After that, it's also healthy food. It's all those purple and blue foods. We know blueberries are so good for us. They have so many other benefits on top of this. Add that in.

Then, it's a high fiber diet and all of these prebiotics and probiotics like kimchi. It goes back to how a healthy diet has so many beneficial effects. This was awesome. This was a great overview and part of our series on gut health. We will continue with another episode soon. As always, this is not intended as medical advice, but for educational purposes only.

That sounds good.

I hope you guys all have a good one. Bye.

Important Links

- [Dr. Karen McCarthy on LinkedIn](#)
- [City Rescue Mission](#)
- [Yuka](#)
- [Bobby Approved](#)

About Dr. Karen McCarthy



Dr. Karen McCarthy is a highly respected internal medicine physician known for delivering detailed, prevention-focused care and for taking the time to truly understand each patient's overall health. In addition to a distinguished medical career, Dr. McCarthy founded the City Rescue Mission medical clinic more than 30 years ago and has spent decades caring for underserved communities. Through numerous medical mission trips and a lifelong dedication to service, Dr. McCarthy has made a lasting impact both at home and abroad. She takes an in-depth approach to health, looking beyond immediate symptoms to better understand root causes and support long-term wellness.

Gut Health Podcast References:

- [The Microbiome and Cancer.](#)
The Journal of the American Medical Association. 2025. Fernandez E, Wargo JA, Helmink BA.
- [Exploration of Gut Microbiome and Inflammation: A Review on Key Signalling Pathways. Cellular Signalling.](#) 2024. Nigam M, Devi K, Coutinho HDM, Mishra AP.
- [The Relationship Between Gut Microbiota and Inflammatory Diseases: The Role of Macrophages.](#)
Frontiers in Microbiology. 2020. Wang J, Chen WD, Wang YD.
- [The Gut Microbiota and Inflammation: An Overview.](#)
International Journal of Environmental Research and Public Health. 2020. Al Bander Z, Nitert MD, Mousa A, Naderpoor N.
- [Gut Microbiome and Immune System Crosstalk in Chronic Inflammatory Diseases: A Narrative Review of Mechanisms and Therapeutic Opportunities.](#)
Microorganisms. 2025. Feng JJ, Maddirala NR, Saint Fleur A, et al.
- [Microbial Dysbiosis in the Gut Drives Systemic Autoimmune Diseases.](#)
Frontiers in Immunology. 2022. Mousa WK, Chehadeh F, Husband S.
- [The Human Intestinal Microbiome in Health and Disease.](#)
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
-
- [Short-Chain Fatty Acids: Linking Diet, the Microbiome and Immunity.](#) Nature Reviews. Immunology. 2024. Mann ER, Lam YK, Uhlig HH.
 - [Dietary Fiber and SCFAs in the Regulation of Mucosal Immunity.](#) The Journal of Allergy and Clinical Immunology. 2023. Tan JK, Macia L, Mackay CR