Introduction and Dr. Norm's Background

– Hi everybody, this is Dr. Diane Mueller. I'm here with Dr. Norm Robillard. Welcome to another episode of Microbes and Mental Health. Thank you so much Dr. Norm for being with us.

I'm really looking forward to our time today. – My pleasure Diane. Great to be here. – Great to have. So tell us a little bit about how you got into this world of studying microbiology, that's what you got your doctorate in, how that led you to specializing more in this whole digestive health world. Just you know, introduced us to you. – Yeah. Well yeah it was a while ago, I was always interested in science and evolution and I just got into microbiology because I really loved the sciences And so my field was microbiology, that's where I trained in, that's where I got a PhD in and that's the field that I've worked in.

I did change course a little bit. Most of us in microbiology back in the 80s were focused more on infectious diseases. In fact my doctorate was on anthrax.

So we were thinking about how to kill these microbes all the time. And then all of a sudden, you know, the gut microbiome came along and it's all of a sudden what you know, better watch these antibiotics, we're gonna kill all these good guys that we need. So but still it didn't make that big of an impression on me but I ended up having a terrible time in my forties and late thirties with chronic acid reflux. And even then I didn't know what caused that.

And um but I just happened to go on a really low carbohydrate diet for other reasons, lose a few pounds and my reflux got so much better. I thought oh my God this is really strange. And I started thinking about why why would that be? It didn't seem to fit the classic theory about ellie s dysfunction, the dysfunctional muscles at the top of the stomach not staying closed, right part of carbohydrates fit into this. So I started doing a little research and pretty quickly I came up with this theory that I think I know what's happening.

I'm consuming a lot of I was on a high carb diet and I'm not digesting these carbohydrates so well that promoting blooms of gas producing bacteria somewhere in my intestines, this gas pressure is building up and it's driving reflux.

And the more I thought about this and I thought about what's wrong with this theory, it turns out there was a lot right about the theory. And then I ended up writing a couple of books on it.

And eventually I just when I started realizing the same kind of ideology or same kind of underlying cause was associated with other functional G. I. Issues like I b. S.

I thought that's it. I just I have to get into this field. So I just I started digestive health institute and uh I haven't looked back so that's how I got here. – It's amazing. Yeah.

So many of us are on such similar journeys of whoops like we find this thing and Pandora's box opens and once there's no turning back so and then we want to orient our conversations today around headaches and that connection with headaches and digestive health and this this big area that I know you focus on in part of your work.

Let's start with. Just a picture of headaches and different types of headaches. Tell us about that. – Yeah, in fact you know I've had some of those myself but and maybe I'll be able to talk about that a little bit as we go through these but You know people break down and categorize headaches differently.

Types of Headaches and Personal History

I tend to think of them in pretty much five different buckets. It's just convenient in my reading and research. You know you have migraine headaches and that's a huge problem. I mean 15-18% of the population suffers with these

and you know some can be um you know, not too bad but other ones can send people to the er so it can be you know, quite painful pain behind the eyes or on the side of the head by the temple and they can last for you know three days.

So people with migraines can really be essentially disabled at the time that they have these and I have had migraines at times usually times that were very stressful with with work when I was in the farmer industry and I wasn't sleeping it up and I was traveling and I wasn't uh you know, taking care of myself very well so I can relate.

So in addition to that kind of pain behind the eyes of the head, some people, their neck and shoulders bother them, they can be sensitive to light or sounds feel nauseous.

So there's a whole variety of symptoms and some variation there, but that's pretty much how I think about migraines. There's also cluster headaches and these are similar.

They can be behind the eyes side of the head, but it's more like an intense stabbing pain, which I just feel terrible for people that have to go through that.

I guess if there's any good news, they tend to only last for up to a couple of hours. So um there's that and you know, at some point maybe we can, we'll talk about some of the treatments for some of these types of headaches, but moving on another, I think good category of sinus headaches.

You know, I've noticed this myself sometimes if I get real congested, I can get a headache and I think it's just perhaps from that and you know whether it's a cold or a flu or even reflux something. I work with a lot of work with a lot of people that have reflux um that can irritate the sinuses and plug up the U.

Station tubes. So in these cases is it it's important to try to understand what it is. Is it a cold that I just have to kind of wait out? But there's you know there's a chance that you may be able to just take some pseudoephedrine or something goes behind the pharmacy counter and that may help in that regard.

Um There's tension headaches, whether it's uh emotional stress or or work related stress. That those can also and I think I think I've had a few of those two um mental physical or emotional stress.

It is important in those cases to really try to identify what these stresses are. Is it is it related to your job case for me? I was trying to write a book, I was working on my house, I had a lot of people you know in my department.

It was it was very stressful. So working through those is really you know part of the solution there. And then the last category is more serious headaches. And these can be something from, you know injuries or some kind of health issue like intracranial pressure or an aneurysm or stroke or even a brain tumor in my readings. I read about brain tumors in these headaches.

But I had I suffered with terrible headaches from when I was about 10 or 11 years old until I was 14 years old and they were really debilitating uh and back then they didn't have an M. R. I. They thought I might have a brain tumor.

And so they would take me into the hospital when he's got really bad and they would give me a spinal tap and in this fluid from my spine which should be clear, it was red, it was blood in my spinal fluid but they couldn't figure out why and they didn't have an M. R. I. So they were giving me milligrams and all of these tests to look for brain tumors for three years.

They were looking for a brain tumor. And finally they gave me a test called a mile a gram. They put radioactive dye into your spinal fluid, lay you on a table and then tip the table up and down and see how this fluid is moving. And mine was moving around an egg shaped tumor in my in my nerves, within my spinal bundle. And this was in the early seventies. And so it's a pretty scary thing more so for my parents I think than me even. But luckily I had a great surgeon um in ST Elizabeth's Hospital in Boston and he was able to remove this tumor.

Put me back together. And that's just was miraculous because it was so long ago. So yeah, I can relate to some of

these headaches. – Yeah all too well it seems. So you talked a little bit about some of the root causes ideologies around tension and reflux and tumor as you're displaying and work, stress physical emotional all these different things but are all of these say five category of headaches? Could we potentially see digestive issues and microbiome issues as potential root causes for all five of these types?

– That is a really good question. Obviously the more serious headache types those are probably not exactly related to the microbiome tension headaches.

I don't really know sinus congestion, headaches. I did mention that connection with acid reflux right? And people that have like Lauren go for angel reflux and some of the upper airways can you can aspirate reflux into your lungs?

Can exacerbate or inflame your sinuses. You station too. So I think there could be a connection there with migraines. There definitely is a connection and then headaches in general right?

I mean at least still kind of early days with some of this research but headaches in general are connected to um digestive health disorders. In fact if you'd like I could really go through this connection between headaches, digestive health issues.

And I'd like to also add histamine intolerance because there's some connections there. – Yeah let's do that. And could you actually also define histamine intolerance for everybody just to make sure everybody understands what we're meaning by that. – Sure well histamine it's a bio active being a neuro modulator it's produced in mast cells so anybody that's had anaphylaxis anaphylactic shock. Hopefully not.

Or analogy these mast cells are producing histamine and they store it in Granules and when these I. G. E molecules on the outside of the surface are connected together they release all of this history.

And so it can give you quite a strong reaction so you can get flushing, you can get high blood pressure vaso dilation, you can get a whole variety of symptoms, some many of which are a gastrointestinal.

Headaches, Digestive Health, and Histamine Intolerance

And so you're getting this histamine from these mast cells right? They produce it through using the enzyme histamine deka boxes. So it's made from history in the amino acid bacteria in your gut.

Many of them have this similar enzyme histamine histamine deka box Alice. And they can produce histamine in the gut and then you get it in your food right?

And the source is oftentimes bacteria on the food. Whether it's an old piece of fish that's bacteria producing histamine from histamine on the surface of the fish and then you eat it. So if those three sources to expose you um to histamine. Yeah. And then of course there's you know die amine oxides D. A. O. Is the main way to kind of defuse or breakdown some of that histamine systemically in the body and a lot of that is in the gut as well.

– Yes. Just to make sure everybody's understanding what norms saying here. So I'm just going to summarize this and you tell me if you want me to summarize it differently after I do this.

So we're going to say that histamine is the molecule that causes a lot of allergy like symptoms and something that you pointed on that I want to make sure everybody caught is that word. But when we're talking allergy symptoms, allergy symptoms and histamines actions can actually also cause G.

I. Related problems. Right? And then die amine oxidase. Is that enzyme that helps us break down histamine. So if we have histamine being released we have this enzymatic way of breaking it down to our body metabolizes it better. So just kind of want to tie that up in a nutshell or anything from a summary perspective just to make sure everybody understands this.

You want to add to my summary of what you said. – No no that's pretty clear I think. – Okay beautiful. You want to show us your slides then? – Okay well I have one, Let me find. Word is I have one Venn diagram and this diagram has basically got three circles. I'm going to show it to you in a second but it's it's um headaches, gastrointestinal issues and histamine intolerance.

And and this Venn diagram let me just show it has really helped me kind of think through this process and kind of do some reading and organize my thoughts.

So yeah let me show the screen. Alright. – Yeah. Thank you for having a picture for us that's super helpful. – Yeah so you can see that. Okay. – Yeah it's perfect.

– Yeah so I think this diagram is a good way to look at it. And they're so there are strong connections between headaches including migraines and gastrointestinal disorders. Things like acid reflux.

Already talked about that. A little bowel syndrome, I. B. S. Inflammatory bowel disease, IBD um uh celiac disease, um chronic fatigue syndrome and the G. I.

Disorders are well researched in in terms of connecting them to gut despite aosis and so gut despite aosis. I've placed right in the center of this Venn diagram as what I believe is really the connection between these three issues. So with gastrointestinal disorders there's clear connections and and I've proposed some of that those ideas myself in fast track digestion and other books and things I've written and wrote and spoken on.

So things like small intestinal bacterial overgrowth, SIBO small intestinal fungal overgrowth, cibo, Sefo intestinal mythology and overgrowth. I'm. Oh and then there's also a couple of very good papers using capsule technology that show that there's people with I. B. S. Have an overgrowth of bacteria in the early large intestine and I'm loosely calling that um LeBeau large intestinal bacterial overgrowth And then you also get into um specific strain differences.

So we've got these you know 100 trillion bacteria and other microbes in our intestines right from hundreds of different species. And so from all of the stool testing uh these consensus populations are emerging, showing that there's you know, some 8 to 11 fill a high level groupings of these microbes.

And then within those groupings individual genus and species. And so what you find is that uh people with G. I. Disorders oftentimes have either overgrowth of certain strains or deficiencies or things that are even missing, missing microbes. And so that's G.

I. Disorders now with headaches. We know they're connected to G. I. Disorders and there's been some great papers on this was a good um review in 2020 and this, in fact, all of these references I talked about I can share with your favorite place to post them later.

But so the headaches are associated these G. I. Disorders. But what they found is that many times by addressing the G. I. Disorders, The headaches improved.

So I think that's another strong connection. And then migraines themselves. Migraine headaches not well studied but at least in in one publication. They showed that people with migraines had specific deficiencies including low diversity deficiency and keystone species such as one important beauty producer for Cali bacterium pregnancy.

I. Certain strains of bifida bacteria and then they also at least the authors flagged what they felt were an increase in certain negative clostridium strains. So I'm still looking at that as well as a metabolite comic changes. So those are all the metabolites that the microbes make and that those are shifted as well.

So I mean so those two that's a pretty strong connection there and then you can look at the connection with between migraines in history. Right? We talked a little bit about that. It's kind of a neuro active modulator.

You get it from these three places we talked about. But what was interesting to me is a recent study, it was around

2019 showed that 87% of people with histamine intolerance were deficient in the enzyme D.

A. Oh right. We talked about that's one of the main ways to remove um systemic histamine E. And so they were deficient. And in another study I forget if it was by the same group or not. But they found that supplementing with D.

A. Oh just having people take D. A. As a. As a supplement improved um uh Was it the headaches? Yeah improved the migrants supplementing with D. A. Oh so there's a strong connection there.

And then lastly just to get to the center of the circle again people with histamine intolerance also show some level of despair aosis like the migrant ear's they have lower diversity.

They also found high zonal in levels. So you know before we get on the tape this day we were talking about you know gut permeability of daniel in a good marker for this.

Maybe not the best but it's I think an early sign that it's something to look at. And whether you have some more sophisticated means to look at that is great but possibly some permeability issues. They had more proteome bacteria.

All right. And those are things like E. Coli and there's plenty of good e coli in the gut. But there's also some pathogenic strains. Proteome back here include clubs Eala species which are pro inflammatory pseudomonas. And so these if you have a lot of proteome bacteria is considered to be potentially a hallmark of dis bio sis.

Um And then lastly they found that people with histamine intolerance had a higher proportion of bacteria that produce histamine. So I think there's a you know there's enough to go on I think to really start to look more deeply into this but also to take some actions You know and I think that the message for me and for people that I work with is anything you can do to improve functional G. I. Issues you've got the health of your gut microbiome and that's just a whole lot of things how you eat.

You know really avoiding antimicrobials overall and um you know whether it's gardening or composting you know anything that you can do to keep your microbiome healthy.

I think it's a good thing.

Gut Overgrowth, Smart Pills, and the Venn Diagram

And then as well we may get to a little later because bacteria in the gut can produce histamine bringing down the level of histamine producing cells by putting your mike on a diet I think is a worthwhile strategy as well.

– Well you gave me a whole list of questions I want to answer. So I want to ask you. I mean so first of all like this whole leave a large intestinal bacteria overgrowth conversation.

I think this is probably going to be a new concept for people. So how do you recommend? Do you? I feel like doing a three hour cibo lacked breath test and looking at more into that third hour. Is that giving us information about the possibilities of LeBeau and if not, how are people determining if this is something that needs to be considered?

– Yeah, that's a good question. I don't think the breath test is so great and I don't think it's so great for a lot of reasons. First of all you know to spend depending on how well your own motility is going. You may end up being diagnosed with cibo just because the lack telos reached your colon sooner because things are moving more quickly through your small intestine. So there are a lot of challenges with that test to begin with. The other thing is once the lack telos reaches the sick and the first part of your colon, there's so much activity there um that these gas levels are going to be, you know very high. And then it comes down to a question of how well the gasses are being uh moving outside into the bloodstream and then to the lungs and being exhaled. I think a better technology and hopefully one that will be developed diagnostically as the one used by the researchers in a couple of back to back papers in 2014 and 15.

And again I can share those with you where they used smart pill technology. So these are smart pills that can radio out data and in this case ph data to a laptop on the practitioners desk and so you swallow this capsule and what goes to your stomach and obviously it's very acidic and that you can see on the graph, ph is like 1.5 it's very acidic and then it goes to the small intestine and the ph goes up to say 5.5, you know, you know you've got that bike are being released at that point in the digestion and it's going through the small intestine and then it gets to the early large bowel and the ph tends to um to drop again because it's more acidic.

So along the small intestine it may get up to 6.5, maybe even seven becomes more acidic in the in the early large intestine. But what was interesting in these studies uh and there were two different studies that looked at this as they looked at populations of people with I. B. S. And compared those results with these smart pills to healthy controls and what they found was no change in ph in the small intestine and then up to a full ph more acidic in the early large intestine for I. B. S. Patients. Now, what does this mean?

Right it's one ph unit is 10 times more acidic so it's 10 times up to 10 times more acidic and I. B. S. Patients. And the way I interpret that is bacteria.

When they ferment carbohydrates the end products they produce a short chain fatty acids right there acids. They're mild acids but they're acids nonetheless. And to me they're results really.

Speak to microbial activity fermenting carbohydrates. – Yeah. Thank you. That's super super helpful. So hopefully these smart pills will become more part of our every day. – In fact. Yeah.

I was talking to a G. I. Out of the meeting in Seattle a couple of years ago and he mentioned that smart pill technology is advancing to the point where they may be able to also measure short chain fatty acids real time.

Some amazing stuff coming along. – Yeah. I'm sure we'll see so many improvements in the next decade in the world of bacteria overgrowth in the intestinal tracts.

How about so when I look at your Venn diagram one of the things that I see is like almost this vicious cycle type of thing. Like do you see elements for example of where G.

I. Despise aosis and gut problems can cause histamine intolerance, but that can go backwards and cause G. I. Despise aosis. You see the bi directionality in any of that at all?

– Well, I guess I tend to look at everything in terms of mostly diet and digestion and microbial growth patterns. And it might be just because that's where I'm focused.

But it is very true that these micro organisms organisms and I got the same way on a piece of you know, three day old fish make histamine and other bio active a means by the way. And they can do this quite well because they also use it for their own sensing and different uh you know, there's different functions of it for the microbes themselves.

But there was a study in 2015 or 16 that looked at and this wasn't in people with migraines, but they looked at um what happens when you put people on a diet that's much lower in fermented carbohydrates?

So, for instance, the fast track diet that I created, it limits lactose, fructose resistant starch fiber and sugar alcohols, alcohols, five types of, you know, for men to believe the carbohydrate on the sugar alcohol case, similar to carbohydrates that are fermented by microbes.

So it's designed to put these microbes on a diet. Other diets are the same way specific car, low fog map diet. They're all kind of gear ketogenic diet for the most part except you can have more fiber on a keto diet. They're all kind of putting these microbes on a diet because there's less for mental material compared to, say, a vegan that's eating, you know, lego homes and all kinds of, you know, high carb food, fruits and vegetables. So there's less for mental material.

And so you would expect the microbes to make less of whatever they're going to make. And they do see this with studies of short chain fatty acids, beauty rate. For instance, people on a on a keto diet.

Beauty rate levels dropped from about 18 mila mola down to somewhere around between four and six or eight. Still detectable in a stool test. That's the way they measure those. But it's less.

And so, you know, there's less activity. Well in this study, they put people on a low for mental carbohydrate diet and their histamine levels in the gut fell by something like eight fold. Now, you know, again, you shouldn't take any one of these studies to be the end.

All be all, you know, how were they measuring histamine in this case? I think it was a daily urine analysis where you can you can measure histamine and and D A all for that matter, all kinds of different ways in the blood and serum.

So skin test. So it would be nice to see a more thorough measurement of histamine. But it's still kind of intriguing and it makes biological sense. You reduce the formidable material.

The microbes are on a diet. They're making less of what they make and they make a lot of histamine and so they make a lot less on these types of diet.

– So then how long if you're gonna give somebody with a dis bio sis or say a histamine intolerant or headache picture if you're going to give them a loafer mental carbohydrate type of diet. Do you tend to find that people that have tended to be more headache type of people or have, you know, just chronic I. B. S. Chronic cibo.

Diet, Low-Carb Strategies, and Histamine Reduction

These types of scenarios, do you tend to find that you need to stick them on these low for mental carbohydrate diets for a super long time? Or is a generalized new lifestyle or is it more of like a therapeutic diet for a short short window?

– It's a good question. You know, II shouldn't say this, but you know how the some dental organizations wanted to put fluoride in the water. I think everybody after 30 should watch their carbs.

But there are people that seem to go through life, They throw caution to the wind. They can eat all of the, you know, fruits and vegetables and legumes and starches and rice and potatoes as they want and even sweets and they never have gi issues.

And so who might have tell them what to do? You know, living large and they're getting away with it. But a lot of us, I mean if you look at the incidents of these despite aosis related conditions, we're talking about a third of the population in the US.

So there's a lot of us and I'm one of them had chronic acid reflux for quite a while. And I know that even now I've been doing this, I've been eating this way myself for 18 years that if I fall off the wagon and the holidays are coming up, the pecan pies are coming up if I fall off the wagon enough and I eat enough, you know, for for mental material more than my digestion can properly process and pull most of it into my bloodstream and not over feed my microbes.

I'll start to have reflux symptoms. I'll start to have regurgitation and heartburn. Maybe some bloating and belching and other gas related symptoms. And I know that I've overdone it and uh and need to get kind of back on the wagon.

So, now, so we're the headaches following this. Well, I think there's some studies, we haven't talked about we talked about the study linking histamine levels with fermented carbohydrates, but there's also some interesting studies by one group, one Italian group, it's too bad. More people are looking at this, but using ketogenic diets for migraines. So I would say for migraines, low, formidable. Cobs worth a try, especially if they're testing high for

history, you know have some of those types of symptoms.

But keto is another good approach. Try and then of course the like the fast track type diet, low formidable cops or keto both of those can be modified to make them also low histamine diets. And I've created a protocol from the fast track diet that is also low histamine. E I wouldn't want to be on it forever.

That is a restrictive diet. – Yeah. – But but I think it's important for some people. – And so what is the mechanism between history and and headaches? Are you seeing that it's hugely from like the histories impact on the vasculature or is it the inflammatory cytokines or what's the mechanism happening there? – Yeah. And it is it's kind of tricky.

I mean we know and we should talk at some point about these ketogenic guys, we know that they do decrease the levels of biogenic amines, right? And in addition to the history that we talked about dopamine serotonin, right, Those are included in there.

And we know that these all have neurotransmitter activities. But how do those produced by microbes in our gut because the microbes are involved in the bio synthesis and and breakdown of these molecules, its currency in the micro populations. But how does it how does it get to the brain, How does it impact the brain.

And so in the case of histamine, it's a little bit of a mystery because histamine is not so good at crossing the blood brain barrier. Right. We talked about the possibility of high histamine levels and leaky gut. So you might get more histamine in the in circulation. But how does it cross the blood brain barrier?

And that's a challenge. Even though I read at least one source, I haven't really flushed it out. That said histamine might have some kind of impact on the blood brain barrier.

There's also a question of whether the vagus nerve that connects the gut to the brain might be another mode. We know that's been proposed as a mechanism of the changes in the gut and short chain fatty acids by the way in in causing or being related to Parkinson's disease. And so in the case of histamine or just gut talk in general, in these neuro active molecules, how are they exactly talking to the brain? I'm not completely sure.

But I'm I'm definitely looking at that because I'm curious myself. – Yeah. Okay, perfect. And then I want to make sure we have plenty of time to talk about the diet and the treatment and these sorts of things. So, I know you just mentioned, you know, keto, something we want to make sure we cover.

Is that where you want to start from going a little bit more into the diet treatment side of things. – Yeah, sure. You know. So we we talked about the low for mental carb diet reducing histamine, right?

And that needs to be reproduced and so forth. But if in fact that's the case, I think that's the rationale for going in that direction. There are not really that I know of studies on that for migraines, but there are thanks to this Italian group um studies on the ketogenic diet.

So the just kind of outlined three of these studies, they apparently got interested in this in 2013, they published a study on two identical twins. There were women in their mid forties that had terrible migraines.

They only had five or six migraines a month. But when I say five or six migraines a month, each one could last 72 hours. So half the days of the month.

They had these migraines. And they were put on and it may have been off to look at the paper and it may have been for weight loss initially, but they were put on cycles of a ketogenic diet for a month. And then a not a low calorie non ketogenic diet for two months. And then they kept repeating that.

And what was interesting. And again, it's only two people in the twins. But they found they obliterated these migraines during the time they were ketogenic.

So two people pretty powerful. But they must have gotten them in interested because they came back in 2018 and did looked at a ketogenic diet for cluster headaches.

And there were 18 cluster headache patients in this study. They went on a ketogenic diet for 12 weeks. And of the 1815 were considered responders and 11 had full resolution, so again pretty powerful results.

Now the monthly headaches. Well, I'm sorry, the mean headaches, I think for this whole period of three months went from 100 and nine down to 31. So again, it's it's encouraging results.

And then they came back and did one more study in 2019. They used a low calorie ketogenic diet versus a low calorie non ketogenic diet in 35 migraine patients who were overweight.

So there's a little bit of a weight loss connection here in these studies, but just bear with me there. And again, in this case they alternated between very low calorie keto and very low calorie non keto.

And they did it for these were one month cycles. And so they were like, these are all kind of crossover designs. They go back on the other one um on a very low calorie ketogenic diet, they had four times four fewer migraine days. With the 50% responder rate that means 50% fewer migraines in that period. So in a monthly period I believe was 74% on the very low calorie keto. So 74% of them had this 50% responder rate compared to 9% on the very low calorie non keto. And that says a little bit about low calorie diets as well that that they don't seem to be good enough if you believe this data.

So yeah. So so what is it? is it the ketones? Right? You have a bump up in ketones on on a ketogenic diet change in some of these neurotransmitters we mentioned um increases or changes in serotonin and dopamine levels.

It's not really clear to me at this point, but these results certainly get your attention. – So then are you if somebody has say this triad that we're talking about right headaches or migraines, gut problems and histamine intolerance.

Ketogenic Diets, Supplements, and Enzyme Support

Are you generally recommending keto to start or sometimes is it more just focused on like histamine intolerance diet? Like how are you determining that difference of when you're using the one versus the other? And I realized there is some, you know, some overlap – Well and don't forget I work with a lot of people, some of vegetarians, you know. So you really have to have a real deep discussion with people about their diet their own what they believe their intolerance on tolerances are things they can and can't eat. You know, some people change their diet because they don't want to hurt animals.

And you know, so you have to figure out what you what deck of cards you've been dealt there and then, and then try to work around that. I do think that for people with, let's just focus on the digestive part of it with digestive disorders that have to do with these, despite IOC's in most cases, various forms of overgrowth, whether it's methane producers or hydrogen producers, that you want to put these microbes on a diet, it's really clear to me.

And for the last 10 years I've been, you know, saying this and almost everybody and most of my peers have been saying the opposite, we're starving the microbes.

We need to keep feeding them, feeding them. And I'm like, not in the west, we have the opposite situation over here, we need to put them on a diet. And so I really think that the best chance of making rapid improvement um is on, on just a much lower carbohydrate diet.

So for instance, in the fast track diet, it focuses on how to digest cops. So I mentioned resistant starch. I didn't say starch resistant starch. Well there's also hello, pectin, a starch that's not that resistant.

It's easily broken down by amylase, right? And so if you just pick up the book and read it, you say, oh great, I can have sushi rice. It's mostly, it's 100% below Peckman no angelos, the more resistant starch.

And usually when people come to me, they're eating bowls of it and I'm like, okay, well hold on. You know, we we for normal people with a functioning digestive tract, they can eat a lot of jasmine rice or certain white potatoes.

Um, they digest and absorb those things very quickly. But for us folks with the digestive health issues, we have to look a little more careful and there's a troubleshooting section that touches on this in the book, we know, and we've known for a long time that many people have, um, pancreatic insufficiency. Right. And so they're not going to produce very much amylase a digestive statues. They may not be able to tolerate those.

Some people don't have much salivary amylase. It's an evolutionary thing, a gene copy number thing. They'll have trouble with statues. And then most recently in recent years, there's been a lot of good research showing that people with functional gastrointestinal disorders are oftentimes deficient and brush border enzymes.

These are the dice accurate days is like, soup Gray's maltese maltese trail is and others and you might say, okay, those are dice accurate aces. So, okay, just stay away from the super gross in the maltose and the double sugars, lactose, right? Lactase is a bicycle races.

But it's not that simple because amylase enzyme only breaks down starches to two and three sugar molecules. This still stuck in the gut at that point.

And so until you can break those down with these dice accurate aces, you're going to have symptoms from even these easy to digest starches. So I don't know. I think I may have either over or under answered that question, but um, it's tricky and I think that the best bet initially is always less is more. That's just my strategy.

And um, I'm strict with people in my program because I really, I just don't want them to not get better. – Yeah, I love your answer. I mean I think it answers it did answer my question, but so many more, you know the question around and as we move into my next question, which is around what supplements, you know, people can use to support this in addition to saying the low for mental carbohydrate diet.

I'm curious like if you can tell us a little about supplements and then also like our typical pancreatic enzymes are not going to have these enzymes you're talking about, you know, suk race and and these types of enzymes that are in the intestinal brush border.

So as we're talking about supplements, is there a way to make up for deficiencies in any of those enzymes that break down dice aka rides. – Yeah. And by the way, there is some testing there too, you can get a sucrose breath test, that will measure soup craze activity.

Yeah, most of the most of the commercial digestive enzymes that kind of, I don't know, it's a bit of a kitchen sink competition throw in as many enzymes as you can think about to you know out compete the other guy.

So a lot of those are you know, different digesting fibers when whoever came up with that idea that we should even be digesting fibers. Those are the ones that are meant to be processed by the gut.

So yeah, but in terms of the digestive enzymes for regular carbs most of them have like the protease, amylase and light paste, the pancreatic enzymes. There are a few products out there that have brush border enzymes. Clear labs vitals times complete is one.

So I think that would be something to look at. Yeah. – And then what other supplements do you use? You recommend for people in these situations? – Well most of the supplements I recommend. I mean my program is very focused on root cause analysis. You know 25 or 30 different things and most of those things won't be people's problems and you you need to work to rule them out though because otherwise you're just spinning your wheels are working on things that nobody cares about. It's not gonna help.

So the very first day I work with people I really do an assessment to see if they're at risk for hypoxia hydra. I go through kind of the risk factors for that and if they can answer all those questions and they don't have them.

I just move on. We don't even have to test for low stomach acid. So and with a comprehensive stool test one of my favorite tests, you know, a good solid comprehensive stool test.

You also have the last days that it's going to give you a read on the pancreas. Unfortunately not the brush border in terms at this point but I like to see that.

And so most of the supplements I recommend My biggest job is get getting people off the 40 supplements are already taking. The supplements I recommend for the most part are all focused on on digestive issues. I really just really focus on how do we improve digestion and of course the whole behavioral aspect of that as well is important.

But there there are other supplements, things like antimicrobial herbs and I think a lot of people kind of pull out the bag out of the bag on day one.

those are maybe 1/4 tier intervention for me. I just don't like things that disrupt the microbiome. I really want to focus on saving, improving, you know, straightening that out, not just beating it down more.

And I think that diets that limit for mental carbs is a very nice way to bring down the the abundance but in a safe way because don't forget diet is only one of the ways we feed these microbes. We also have these, you know 20 or so muse and molecules that comprise mucus that are complex, you know, the protein backbones with these complex policy. Sacha rides on the end and they have nitrogen and sulfate ID groups. It's a complete food source for microbes.

And more importantly, it's a lock in key food source. Any old pathogen can't wander in and get to those carbs, but the microbes in the gut, the Cali bacterium Presidencia, that was one of the ones that we showed was deficient in in one of those instances is great at doing that fella right as the name implies. Great at breaking down because but what these also do they have the enzymes to fit the key when they break these down to feed themselves, they end up cross feeding the other microbes, which is I think a reason why I'm not, it nearly is worried about starving the microbiome.

I think that idea I just don't think it was ever correct. And also I think it adds some rationale to the works of like the obesity code by Jason Fung, you know that wow, you can you can just go without food. You'll be okay.

I thought that myself when I read his book, I read the obesity code, he's got the diabetes code as well and I fasted for over three days and I was just really shocked. Wow, I'm still alive.

I didn't even the tricky part. I was doing it on myself to really explore, explore it as a more advanced tool for digestive health issues and one of the you know I did fine on the fast although I hated it in one regard because I like the simple little whiskey at night, couldn't do that.

That was one killer but the other one the the troublesome pot from me was re feeding I really at the end of the three days okay I did it but man I'm ready to eat now and then you don't follow his advice and have a little broth and take it easy.

I would end up with soft stools at the end of some of these fast. So – Yeah it's a really important component breaking the fast. Well I feel normal like I could talk to you all day but I know I'm supposed to keep us on track today so I need to wrap this up. But your fast track diet book, you have a few different fast track books. Right?

– Well just to I was I was planning on writing a whole series. – Okay. – I stopped at heartburn or acid reflux and one on I. B. S. And it's a very similar diet but the focus is on those two different conditions – So people can get if they want to know more about some of your approach and that sort of thing. They can check those out right and then everybody like everything will to everything to find norm will be in his speaker profile.

So make sure you look at that. But if you go to digestivehealthinstitute.org or the digestive Health Institute facebook, you can also find more information about Norm and the work he does there. So thank you so much for your time today.

This is a wealth of information and knowledge and I know it's helped so many people, so really, really appreciate you being here with us. – Thank you for having me Dr. Diane.