And all of the sudden in the last 150 years, we see this mass extinction event. And I think of it like climate change in that it's so acute and so dramatic.

we are seeing a 90% loss of flying insects because of climate change. We're seeing the same kind of scale of mass extinction in our gut microbiome diversity from all these factors, not least of which is that we don't eat 100 grams of fiber a day anymore.

And I think that's my favorite part about all this work and speaking to people is imparting that although there's a level of frustration of not knowing, there is an opportunity in the fact that know so little to continue to learn and have tools that we never thought autoclaved poop would be something people could use.

And I think it's not the right answer for everybody, but the fact that it can work for some people is kind of incredible. Have you made it past menopause, or are you going through it now?

I'm Dr. Pat McShane, and on the Women's Health Span Voices podcast, I'll guide you through the health challenges of the menoppausal years and beyond, guiding the way to thriving in this powerful era of your womanhood.

Hello and welcome. I am delighted to have as my guest today, Dr Andrea Macbeth, who is a naturopathic doctor in her former lifetime before she started working on her current project, which I'll let her tell us more about.

She encountered a number of patients with gut issues and post antibiotic major infection with Clostridium and was one of the leaders in the use of early fecal microbiotic transfer, and she can tell us a little bit more about that and has now segued into being the CEO and medical director of a company that makes postbiotic agents that we can take for our gut and general health.

And again, she'll tell a lot more this. So I thought we would have a deep dive today in the gut microbiome. and welcome Dr. Andrea. Thank you so much for having me.

It's my pleasure. it was cool to meet you and see your podcast and it's a great opportunity. I'm excited to learn from you as I share my knowledge as well.

Great, great. Well, again, we're going to be talking about the gut microbiome here today. And we have microbiomes in other parts of our body. We have an oral microbiom, a vaginal microbioma, even a skin microbioman.

Maybe, Andrea, you could tell us a little bit more the definition of a microbiome and why we should care about this. Yeah, it's my favorite organ system.

I like to say the organ-system we didn't know we had. The most concise version is we have microbes, bacteria, viruses, fungi, living in and on us as part of our adaptive genomics and adaptive reservoir for what we eat and drink and think and interface with the world.

And what I mean by that is these microbes we've been co-evolving with since the beginning of time are like an ecosystem helping us and sharing resources and nutrients.

There's over a couple pounds of this in specifically our colon. If you've heard about the microbiome and come across it in media, you're probably thinking about gut microbiomes.

But like you mentioned, our whole body is like a planet. And there's all these little islands of microbial diversity in our mouth, in armpits, on our skin surface.

We only discovered it properly and started researching it a couple decades ago, which is why it's not part of the organ systems we traditionally think of, the brain and the heart.

So probably most of us are familiar with the idea that our gut microbiome is important for our health, our digestion, and maybe we've made it over to metabolic health.

You can probably expand that repertoire of what our microbiomes does for us. And again, this is very active research and much of it is quite new. Yeah, I like to think about it as the gut microbiome can kind of explain everything.

I mean, obviously I have a bias because it's my passion and area of hyperfixation as a previous researcher. It was how I I kind of brought the bridge between nutrition and wellness to the physiology and biochemistry.

But what's happened in the last 20 years is we've now understood that there is a dynamic interplay of the gut microbiome and the molecules they make to most of organs in our body.

And I actually think the microbiomes is best thought of as an endocrine organ. because it's making signaling molecules that can bind receptors to our neuronal cells, to your immune cells maturation, it can go and impact how our bone density changes in our bones marrow.

It can find receptors and change the expression of how are our cells work in your eyeballs and our distal muscle tissue and mitochondria. So I don't think that there's even at least I don't know, a lot of tissue in the body that doesn't interface with the microbiome, either directly or indirectly now that we're starting to be able to see it and look for these molecules that bacteria make and even the epigenetic modulation that these molecule have on our broader, I think of them as our ability to adapt to the world in a way our human genes can't.

And they really do that across all of our physiologic systems, cardiovascular, metabolic, immune, and neuro, sort of being the heart of that. I read recently that 70% of serotonin is made in our gut.

And that obviously is so important in brain function and our mental health and mood and so on. Glucose regulation from the butyrate and and that all sounds wonderful and fantastic, but there are obviously problems in the current era with many people's gut microbiomes and maybe you could expand on that a little bit for us.

Yeah. Okay. So I love teaching about the microbiome. It's like my favorite. I think in a previous life, a high school science teacher would have been my preferred path.

But honestly, this is the right topic for that, right? We have this organ system of you know, so much complexity. It's like we're exploring the deep sea or the far distant galaxies.

And we had never had a telescope to see it before. What happened, I think, really can go back to Koch's postulate and germ theory and our understanding.

So we started to see microbes when the microscope was invented by Van Leeuwenhoek, but that was hundreds of years ago. And then about 100 years or in the 1800s, 1900s we really started disease and infection with a bacteria, and that's germ theory.

You have a disease, And it causes an infection if you kill that bacteria you treat the infection, which was miraculous and really changed human trajectory.

What happened when we started to use antibiotics and kill bacteria to prevent infection is that we missed this whole universe of good bugs that are central to the nutrients and this adaption of our health.

And there's a book by a researcher named Martin Blazer called Missing Microbes that's one of my favorite books of all time. The whole concept of the hygiene hypothesis is that when we started to move away from or protect ourselves from infectious bacteria, we also started deplete our access and interface with good microbes.

So when you stop being in the dirt, when use antibiotics and antimicrobials on everything in our food system, we just have a more sterile environment.

How about caesarean delivery? Totally. Yeah, yeah, and all these things we've, I mean, we have been co-evolving with these bugs for millennia and, all of a sudden, in the last 150 years, We see this mass extinction event.

And I think of it like climate change in that it's so acute and so dramatic. We are seeing a 90% loss of flying insects because of climate changes. we're seeing the same kind of scale of mass extinctions in our gut microbiome diversity.

from all these factors, not least of which is that we don't eat a hundred grams of fiber a day anymore, right? Or, nor could we, for most Americans, we eat six to ten grams.

And our food comes from a sterile processing environment, oftentimes. Yes. Yeah, so here we are starting to see kind of the damage that's been done and reconciling how that plays into chronic disease.

And the cool thing about the data that has come out since the 2010s when the Human Microbiome Project was published is that the one variable that you can correlate across almost all of our chronic diseases is loss of microbial diversity in the gut microbiome.

Diversity isn't always good and a bladder can be bad. You want a very specific kind of ecosystem there. But in the colon microbiome, which is where we process our fiber from food and where it's most impacted by our global food supply, Which is why there's so many antimicrobials in our food chain is because food has to travel across the world safely.

But the trade off of that is that it is much more sterile and we don't get the good microbes we used to. So anyways, here we are today. And I think it's just a great conversation to be like, okay, well, what can we do to rescue?

What do we know about the mechanisms of what this means? How does it impact human health and how can use this lens to think about new solutions? And just like climate change, I don't really think there's wrong answer.

I do find it from a medical perspective and a functional kind of lifestyle support to a very helpful paradigm to say, how can I help you navigate your quality of life from one step to another?

Because at the heart of it, to some level, we all have a microbiome loss of function. And it's not readily measurable, easily measurable. There's a lot of consensus about what species we should be having and so on.

And I'm sure you're going to come back and tell us a little bit more about that when you talk about your postbiotic product. But I'd like to shift gears a little bit now and talk about menopause per se, which of course is our main audience interest here, and how menopus layers more difficulties onto the microbiome basically.

Yeah, okay. So I was excited about this and I trying to think about how I wanted to frame the basic science. And I think what we know about the micro biome is that estrogen and women and the role that estrogen plays in modulating our gut microbiome makes women more resilient.

And it plays into this factor of us or people who have female hormones and are going to be reproducing and having babies. It gives our microbiomes an advantage of kind of, I think about it like a hormesis or buffer state.

and we have a more diverse microbiome up until menopause than men. And what happens in menoppause is when we lose that estrogen, our microbiomes shift kind of looking more like our non-estrogen producing peers.

There's a bunch of little examples about this, and I will say that like you mentioned, the microbioma research is largely been about naming bacteria and we're just starting to see.

More than just genome sequencing and looking at functionality but diversity and kind of the species in the names

are a big part of what we are looking and there's examples of things like estrogens impact on enzymes in liver that then impact.

cardiovascular-related metabolism of metabolites or estrogen's impact on microbes that impact metabolic state. And I think all of these little examples are giving us this broader picture of the adaptive state of our being able to have a baby and be more resilient to immune and all the different things is in part mediated by our gut microbiomes interface with estrogen explicitly and the estrabalone and then in menopause we shift towards a picture that more mimics our male counterparts and what that means is there is a different set of risk factors in the gut microbiome and paralleled by like the lived experience of people having all kinds of different gut symptoms that change with hormones and perimenopause and menopausal.

Was that clear enough? I was trying to be as broad as I could, but be like, our hormones matter, the microbiome is impacted, and there's so much to unravel there that is just starting to get studied.

Yes and meanwhile our risk for a lot of the disorders that are probably linked to our health to having a healthy gut microbiome or not such as cardiovascular disease and dementia and bone loss are are going up also in in relation to are dropping estrogen and and other factors.

So this is kind of a double whammy for what we would like our gut micro biome to be doing for us but it's having even even more trouble than it was before.

And again, maybe let's shift gears and talk about how the estrogen that our body is still making in menopause, which we do have, is being properly circulated and recirculated by our gut, if things are healthy in there.

Give us a couple words on that, please. The astroblome. Yeah. Astrobalome is such a cool word, but I mean, So there's a very unique relationship with the liver and the gut microbiome because of the portal vein, right?

And there is a circulation that's kind of of its own, and molecular signature to estrogen so that it can get excreted. So the liver is the first organ in this, or the one that's starting this pathway, right?

So we have some estrogen, some of it needs to get excited, it goes into the gut microbiome, and then there's this second layer of feedback loop and modulation that is on our microbiome.

And the microbes can choose to remove that tag with an enzyme called beta-glucuronidase, which then allows for reabsorption of that estrogen so it doesn't get excreted.

In initial, you're like, oh, well, then microbes are doing a bad thing. They're breaking our natural system. But that's not really true. This feedback loop is, throughout our lives, a really important ability for us to modulate the estrogen with this environment around us.

And the metabolism in the environment of the microbiome can up and down regulate this enzyme beta-glucuronidase from bunch signals coming from our human body and the environment around us to know we need more or less of that estrogen and later in life that becomes particularly precious.

This happens in men too, but I think in women and menopause, it's one of those markers that I think is a big part of our future support in menopause and understanding the microbiome's role is more regular testing and understand of the role beta glucuronidase is playing in this cycle that's happening because You could have your normal physiology working fine and you're making the right amount of estrogen and your secreting the amount.

But if the microbiome is out of whack, it can shift that either to being too much for where you want to be or too little and really off set that balance.

Again, you think about all of this like hormones, it's a very delicate teeter-totter that's kind of multi-dimensional and we're just sort of scratching the surface, but I think it is really cool to know and see and have the mechanism for how estrogen is directly mediated by our gut microbiome.

And it might be particularly important for our bone health. Who knows? I mean, again, just starting to investigate a lot of these issues. So, yeah. Tell us about what we can do short of the supplement aisle or with your company to support our microbiome and then where supplements and other products might fit in here.

Yeah, I think It's so cool that we have the ability to modulate this really important organ system with so many things. And I think for me, nutrition was the reason I left.

cancer research and became a naturopath because I just know at the heart of what we have agency over in choices, at least on some level, is what eat and the environment we eat, the things we can control in our environment and gut brain connection too.

Nutrition is at supporting the microbiome. And I say that with the caveat that I understand there's many people out there on very restrictive diets who have, you know, done all the right things and that's a different conversation about disordered eating.

But I think at a baseline for general health and people in this country, we have so much power to support our microbiomes with fiber, with plants of different colors, the role that polyphenols, which is what we call you know, the colors and fruits and vegetables over simplify.

Pigments, yeah. Is they are so important to the microbiome health. Fiber is not a uniform solution for everyone. If you come into eating a bunch of fiber with a low microbiom diversity, you can actually cause more inflammation.

So I think having more education about the way and support around dietary interventions where you can low and slow reintroduce stuff, fermented food has incredible data.

And as much as you have to find a balance of not driving yourself crazy with our food being poisoned, just the basic principles of avoiding ultra processed food and things with antimicrobials in them can go a long way to supporting our microbiome later in life.

You know, there's lots of things that we're looking at for early childhood development, but the nice thing is it's not written in stone and we do have power to continue to support ourselves and impact both prevention and supporting things, that already are happening like bone loss or brain health or, you know all those things we think about later in life.

So maybe moving down the path a bit to talk about prebiotics, probiotics, and postbiotic and where your company fits into all of this. Yeah, so I will give just a definition.

Prebiotics probiotic and postpiotics are marketing language. There is like kind of adjacent science definitions but largely They're words for marketing, really.

Prebiotics are the food we eat that the microbes then use as their food. So fiber is an example, but so are polyphenols, which are those pigments and stuff that we like berries and kale.

Probiotic are bacteria that either we ate like in a yogurt or a fermented sauerkraut, Or kind of loosely, I think about all the bugs in our gut microbiome that are potentially beneficial also as probiotics.

And then postbiotics are the things that those bacteria make when they eat the prebiotic. So you have the food, the bug, and the thing that's made with that process.

That's a post biotic or small molecule metabolite like a bile acid like butyrate. Also, post-biotics are thought about in marketing language as any heat-killed bacteria as a supplement.

I think it's a little confusing, but the important part of that postbiotic heat killed bacteria are all those small molecules that they were making, and then they've been inactivated.

So, you can make a post biotic out of I mean, there's postbiotics in sauerkraut or in yogurt because there are bacteria eating the precursors and making small molecules.

We made a post biotic out of human stool that is kind of in parallel from the work we did in fecal transplant. And I can maybe give a definition of that before we dive in.

But imagine that our human gut microbiome isn't just bad, but there's all this good nutrients in a healthy ecosystem. And we want to capture those small molecules from a health donor's stool.

We do that by heat killing and processing that into a super post-biotic nutrient. Does that make sense? Yes, totally. And who might think about or know, whom we know might need these various products.

Yeah. So I think that goes back to that conversation about Loss of diversity and loss of function and inability to tolerate lots of fiber. There's lots reasons we can't make all these post-biotics that a person who was vaginally born and breastfed for two years and has never had antibiotics and eats organic and it's never been sick.

Those donors that we have mixtures of nutrients, I think of it almost like a multivitamin that you can make unless you have a healthy ecosystem. And while we're at the infancy of understanding the mechanism of what happens when you have loss of microbiome diversity and function, we are also at infency of understand what it means to replace that and how that can help people.

We primarily work with gut regularity. exploding, abdominal pain, and then occasional constipation and diarrhea, which is just kind of at its most basic downstream dysbiosis.

Things like, you know, SIBO-type symptoms, things like that, where people have had acute periods of their gut health not feeling good, transient anxiousness and sleep and fatigue and things like that.

But what we have learned from the microbiome in the last 20 years in fecal transplant and other probiotics is that there's so many other downstream impacts that a healthy microbiom can help with.

There's really cool probiotic on the market, not ours separate, that are for bone health in menopause that has good data in it. brain health, immune health metabolic health is all kind of in this stew, which is super exciting.

I kind feel like we're at the very beginning, even though we've been doing this for six years, you know, we still just know nothing. So someone who has unexplained or resistant symptoms besides gut symptoms might be a candidate to try some of your post-biotics is what I'm hearing.

Yep. Yeah, one of my favorite groups of women to work with were perimenopause menopausal women who had chronic UTIs and like hundreds of rounds of antibiotics.

That chronic pernicious and prevalent. Yeah. I think looking at the microbiome and fiber and probiotics and even postbiotics just to have support and reduce the side effects of that chronic antibiotic treatment is something that I wish anybody who is in that cycle got support with.

And I think that's just one example of this sort of sub-cohort where supporting the gut along with the other components of treating the chronic UTIs can be really helpful for people, both in prevention and sort-of short-term quality of life, too.

Mm-hmm. I that that is a great example. Any other group of women for whom this might be a good starting point? Yeah, I do think people who've had a long history of lots of hits, right?

You think about, okay, all the things in the hygiene hypothesis, vaginally born, you know, early childhood, but then also, did you take Accutane as a teenager, which is particularly hard on the gut microbiome?

Lots of rounds of antimicrobials or antibiotics, a not tolerating lots of foods, getting to a point where you really feel

like your gut is mad no matter what you eat.

And I think I'm really interested in MCAS and histamine and the role in food sensitivities, not over allergies, but this sense of anything I eat makes me feel miserable and bloated and gives me abdominal pain.

And that is a more prevalent problem into perimenopause and menopausal than we, I think, talk about. I do think that there's a role that this loss of estrogen plays in our tolerance for I mean, it's kind of a can of worms to get into, but that group of people in particular, I think about helping and giving tools because again, there's no wrong answers there.

Right, right. Is there research going on in any of these subgroups of Yeah, so we are doing our own observational cohort long-term study with our particular product, which is the stool-derived postbiotic, but there's lots of work being done with lots microbiomodulating.

So nutrition, fermented foods, fiber. My favorite lab out of Stanford is The Sonnenberg Lab, and they have some of the most interesting work on large nutrition cohorts.

and the impact that and how to introduce fiber and fermented foods in these different categories. And then MCAS is tricky in sort of this functional idea of food sensitivities.

It hasn't quite been made it to the big leagues in conventional medicine yet. It depends who you talk to. But there is a recognition within gastroenterology that, you know, IBS is such an umbrella of things that we don't know.

And then there's, there are official I. B. S. but there're all these symptoms that don' meet over Rome criteria for I B. S. that are more dysfunctional we don't feel good.

And so I think what I'm excited about is as we start to have more tools to measure the microbiome metabolites and put this mechanism together, there'll be better work to look at the role histamine plays and hormones play.

And even just with GLP-1 medications on the market, you know, GLp- 1 is a microbiome metabolite that we make on-the-gut lining cells when it binds a receptor of a metabolit.

The difference between our endogenous GL p1 is that it goes away in hours and the drug version of Ozempic or turzapetide, wakobi, is that it stays around for six or seven days as a longer half-life, but that mechanism parallel is teaching us all kinds of things we had no idea about the role that could play in our brain and addiction and dementia and alcoholism and, you know, and blood sugar regulation, obviously.

Yeah, no, we're in a new era with that, and in fact, I'm about to do a podcast about discontinuing GLP-1s or transitioning from the injectable to the oral version.

Chemotherapy, We didn't talk about that. I don't know if you'd care to speculate. Again, did a recent podcast and a little number came up that I was a bit shocked at, which is that 40% of women will end up with an invasive cancer during their lifetime.

many of will be on chemo, and chemos certainly impacts on our gut functioning and probably our microbiome, although I'm not familiar with that data at all.

Yeah, I am very passionate about that. I used to work in blood cancer research before I became an antropath. And I think what I'm most hopeful about is immunotherapy, specifically getting to a place where immunotherapy becomes first line for cancers down the road as we start to understand more, right?

And there is really cool research about immunotherapy and our ability as our human immune system to respond to immunotherapies being interrelated with our microbiome health.

And so if you have fiber and healthy microbiomes diversity and good ecosystem going into immunotherapy, there's

really good mechanistic data that shows you're more likely to be a responder and to have less side effects.

Because the reason people don't respond to immunotherapies or have to quit is because of colitis or having a negative side effect. And so the gut microbiome and research out of Texas, one of my favorite researchers of all time is Jennifer Wargo.

She was originally a surgical oncologist who did mostly breast cancer work, and then she became a fecal transplant microbiom scientist. even just like lectures on YouTube about the role that the gut microbiome plays in advocating for patients to not get heavy rounds of nonspecific antibiotics, because that happens, right?

You'll have traditional chemo and surgery and a bunch of antibiotics and then you'll go into immunotherapy and your likelihood of success diminishes. But she's done work and other people have done research looking at the role of both fecal transplant but also just fiber and polyphenol powders and things as simple as AG1 kind of vibe stuff where it's just good quality poly phenols supporting people's response to immunotherapy.

So that's where my brain goes with cancer in like hopefulness for the future is that we can help immunotherapy be successful for women by supporting their microbiome going into it and advocating for it.

Chemo and traditional chemo in radiation is a big assault, right? It just knocks you out. And so again, on that other side, anything you can do to support rebalance and nutrient absorption.

I mean, I left oncology, my sister had leukemia and I was a researcher and watched this from the patient side. She's alive and did really well, but like, There's so much we could do to support patients and people going through this process that's not in the traditional paradigm that is related to nutrition and microbiome support.

And I don't think it's 100 supplements. I'll be really honest with you. Even though I have a supplement company, I do not really love supplements, but I think there are specific places where there is a cost benefit for strategic support, Nutrient support in the form of soups and broths, and smoothies and easily absorbable nutrients are so much more valuable than we give them credit for specifically in context of cancer treatments.

And the nice thing about this new era of post-biotics is that they're not alive. They don't pose infectious or opportunistic risk. But there's still all this other stuff we can do related to nutrients.

So that's my long kind of soapbox. You asked me my favorite question, which is, oh my gosh, how do we have hope for this bleak future of us all navigating friends or family ourselves?

There's so many people with chronic illness who have been under various kinds of treatments for so long. And what I'm hearing from what you are saying is that this does have a big impact on our gut microbiome in different ways.

If we've lost weight because of anorexia or antibiotics or surgery or chemo or whatever, that there's a lot of room to move here. without invoking more invasive than intensive medical therapy.

So that's exciting. Can I have you back in a couple of years and we'll talk about what we've learned in the last couple years? Yeah, I would love to. It's like, it's wild.

I just did a lecture for the naturopathic college. adjunct teaching and I've been giving this lecture about the microbiome and how cool it is and fecal transplant for like a decade and i redo it every couple years and do a deep dive and This last round of me carving out a week to do research and really think about what the new data means is the most hopeful I've ever been.

There is so much cool stuff happening and you know it feels like kind of like there's this we're in this storm of dystopian you know, house gate, but there's this little light and we're in this floating bubble.

And I do think for me, coming out of academia and feeling hopeless, the microbiome has offered this light in the

storm in a way that gives us personal agency and a new frontier and opportunity to not feel hopeless.

Just because we don't know the mechanism yet doesn't mean there's not this huge opportunity. I think the future of drugs and medicine is going to have an interplay with the microbiome and the metabolites they make, really, fundamentally.

So yes, I'd love to come back and tell you all about it. And your perspective as a functional medicine doc, obviously, is the one that I think is going to carry us forward.

Me, trained as very conventional medical professional, we're moving there too. Yeah, I mean, that's the coolest part. Even conventional medicine, neurologists didn't want to say the gut had anything to do with neurology and there's enough data now that they have to admit it.

I'm going to interview a dentist to talk about the oral microbiome and the brain and other topics as well. So we're starting to take ownership of this other organ in our bodies finally, thank God.

Anything else on our last moments here that you would like our audience to hear that we haven't covered? We've covered a tremendous amount of material.

Yeah, no, it's my I just I like to give people hope and I know as somebody who has chronic disease and my mom had chronic and whether you're a practitioner helping people or you are a person who feels like you don't have hope, and you've tried everything, I'd just like this permission to know we don't know what we do not know yet and there's so much opportunity to be your own scientist and the thing about the microbiome that is so special is that everybody is different and unique and so just because things didn't work for other people or what did work or other didn t work doesn't mean there is not a toolbox out there to help you have a better quality of life and it's really about There's no one magic bullet.

It's about building a toolbox across the things you have resources for and access to find those places that we can use to improve or heal or support or whatever our own individual experience.

And I think that's my favorite part about all this work and speaking to people is imparting that although there's a level of frustration of not knowing, there is an opportunity in the fact that to continue to learn and have.

tools that we never thought autoclaved poop would be something people could use. And I think it's not the right answer for everybody, but the fact that it can work for some people is kind of incredible.

That's why I'm excited. More to come. Well, this has been an exciting ride, I would say. Hopefully our audience appreciates it as well. I am very sincere in wanting to hear more as it develops.

And thank you so much for your attitude, your experience, and just your knowledge and willingness to explain it to us today. Thank you, so, much, Dr. Andrea.

Yeah. Thanks for having me. Take care. To our audience, if this is the kind of information that you like, please share it with your friends so we can get this good word out to more people.

We'll see you again soon. Thanks for listening to the Women's Health Span Voices podcast. If today's episode spoke to you, follow the show and share it with a friend ready to take charge of her health and please leave a review.

It helps more women find us.