Gut Dysbiosis And Microglial Activation As Drivers For Alzheimer's Transcript

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Introduction and Guest Background

Welcome to this episode of the Reverse Alzheimer's Summit. I'm your host, Dr. Heather Sanderson. I'm delighted to introduce you today to Dr. Miles Nichols.

He's a functional medicine doctor specializing in Lyme mold, illness, gut, thyroid and autoimmunity. After he personally struggled with chronic fatigue in his early twenties.

Dr. Miles dedicated himself to figuring out the root causes of chronic disease. I'm excited to introduce you to him today. He's going to share with us a lot of these deep connections between the gut, sinuses, the microbiome, and how all of this affects our brain and most importantly, our cognition as we age.

Dr. Nichols, welcome. Thanks for having me. Dr. Sanderson, looking forward to it. Tell us a little bit about your journey. What happened? Well, growing up, I had a father who was in medicine and public health and politics and many other things and was doing really good work in the world.

In fact, he had just gotten to be elected a state senator when I was babysitting for a friend of my sister's about 15, I got a call, old style phone. I remember it vividly, kind of cream colored, big phone on the wall.

The curly thing that attaches it to the wall. And they picked it up and it was someone from the church saying, Something's happened. Your father is in the hospital. You've got to go.

And someone else came and took over and I went. And it turned out he had passed suddenly and unexpectedly from a heart attack. And that really threw me for a loop because he was top medically trained Stanford Methodist Medical School, Yale Public Health Masters of Public Health.

I mean, Harvard Public Health Masters and job training and really invested in public health. And yet this had been a surprise to everyone. We hadn't seen it coming.

There wasn't the predictive and preventive level of medicine that I was really looking for, and I felt that that stress was missed, that nutrition was missed.

It just started opening me to look for a different way. And then when I was going through school, I struggle with chronic fatigue in my early twenties and I was having a hard time even getting through school.

And when I was called into the principal's office and talked to about the fact that my tardiness might impact my ability to graduate, I decided this is something I need to take very seriously and figure out.

And in talking to her about it, she said, I don't think this is you know, she's she's like, you're your grades are great. You're you're intelligent, you're doing well.

It's just this this inability to get there on time. And I said, I've tried. I sleep 9 hours, 10 hours. I'm still tired. It's hard to get going. She said, I think something's medically wrong.

I said, I agree, but I've gone to the doctor. They measured everything they said.

Personal Health Journey and Root-Cause Medicine

We can't tell if anything's wrong. Maybe you're just a little depressed or something. Cause I didn't feel depressed at that time. I mean, I was a little depressed about the fact that I might not make it through school, but it was circumstantial depression, more than it was a feeling of despair unrelated to circumstance.

So I started to get very serious about figuring this out, and that took me down a road of seeing sleep specialists, seeing integrative practitioners and providers looking at every angle I possibly could, and nutrition, energy work, spirituality, mindfulness practices, meditation practices.

I mean, I've I've done a lot of weird and wild things on my journey to try to figure this out. And it took a long time and I've discovered along the way that I did have a subclinical thyroid issue that was not discovered, and I did have a gut infection despite not having digestive symptoms.

I did have Lyme co-infections, but BRCA and Bartonella both and later discovered there was a tick problem in the place I grew up. I didn't know until just a few years ago and and many, many other.

I lived in a moldy place with mold exposure and I figured out I had an autoimmune attack against cells in my stomach. There was lots of stuff that I figured out along the way, but it took a long time because no one, no one put all those pieces together for me.

And fortunately I had some good mentors and functional medicine and I had to look directly at research, figure a lot of stuff out for myself, and rely on some really great mentors in order to piece the puzzle together.

And finally arrived to a place where now I feel great, great energy. The brain fog is gone, the migraine headaches are very rare and generally my health is amazing at this point.

But it took me a long time to get here. What a journey. You know, in my clinical practice, sometimes patients when I first see them or their first introduced to this medicine and this functional approach and finding the root cause, there's a little pushback, right?

They're a little hesitant about doing all the labs. So I really encourage people. What I hate having happen is that waiting a year to figure out that that lab we could have run a year ago had answers in it.

And really, like you are sharing a very deeply personal story that emphasizes this kind of take home message of like, let's just get all the data we can figure out if there is a gut issue, even if you don't have symptoms or even if you don't know you were exposed to all that.

Go ahead, run that lab so that we can figure out as comprehensively as possible early on in the game what is driving the imbalance or the dysregulation in your system.

And like even just in your story, it just illustrates like if somebody can do that for you, what a gift, right? Yeah, absolutely. And and I know the topic of this entire summit is Alzheimer's.

And my uncle passed from Alzheimer's, and that was hard to see. And that was something that, you know, I'm I really I could see signs in in my mom, too.

And there's this is something that starts a lot earlier than a lot of people think. And by doing labs early, because there's some statistics that 80% of the American population does not know, the early signs of mild cognitive impairment, which means that a lot of people have early signs and may have early root causes already showing on labs when they don't recognize or realize that it's an issue, that's the best time to intervene.

I wish for my father. There had been a couple of years, a few years, five, ten years ideally, but a couple of years at least of seeing it coming on labs and the kinds of labs that we can do that predictive and preventive.

Now, I am very concerned and could have seen it coming and I would have been able to help if I knew then what I know now to do. And I love it that we are both very committed to making this available to patients.

Now, with what we know now, there's so much we can do. It's almost overwhelming how much there is that we can do to prevent and even reverse dementia and cognitive decline.

So let's not wait. But like you said, let's intervene early. So let's dove into the gut piece of this. So tell us at a high level, what is the gut brain connection that everybody's talking about?

So I'll I'll start even one step back from that, which is that there are three big processes that are occurring from a very young age. Not a lot of people realize, and that's a natural, sclerotic process, that's a cognitive decline process, and that is a process of cancer formation and cell formation.

Now, the body for a lot of life does a good job at clearing out some of that plaque, clearing out some of those cancer cells, and in clearing out some of the degeneration in in the brain.

But this these processes have begun way, way, way before even the most mild symptoms begin. It could be as you know, children are starting some of these processes already.

So from that perspective, the gut is one of the initiators of some of these processes. And it's well understood. One of my favorite, because it used to be that neurologists didn't recognize a lot about the gut and it was sort of the neurologists are looking at the brain and the brain function and then the gastroenterologists are looking at the gut and the gut function.

But over the past ten or 20 years, there has started to become many neurologists that are studying gut bacteria. One of my favorite studies was a study that looked at mice and took mice and fed some of them a probiotic feed and some of them a sterile broth with no probiotic the probiotic filtered lactobacillus from noses, and they subjected these mice to a stress test.

They made them swim in water that they couldn't get out of. And this is a forced swim test is very stressful in mice. So it's something they're trying to get out, try and get out of.

They can't their stress hormones, corticosterone, which is like cortisol for humans, goes really high. They're stressed out and they will give up after a while.

They'll almost resign and just float there and they don't want to be in it, but they re resigned to their circumstances eventually.

Why Early Testing Matters for Cognitive Decline

What happened with when they took these two groups is that the group that didn't get the probiotic, they did give up after a series of a few minutes, the group that got the probiotic didn't give up.

They kept going and going. It was like they were regulating their stress response on the fly and they thought, Why is this? So they measured the brain chemicals and some of the hormones.

So they measured the stress hormone corticosterone and they found it elevated in both groups. But interestingly, they found Gabba. Gabba is a neurotransmitter that's produced in the brain that helps.

It's a relaxing, inhibitory, calming neurotransmitter and there were these waves of of of GABA regulation in different areas of the brain for the mice with the probiotic.

And they thought, why, why is this? So they took the two groups. They took the one who had that change and they cut their vagal nerve. They did a big Artemis.

So the vagus nerve connects the brain to the heart, the gut in any other places in the body. And immediately that force swim test reverted. They didn't have the same GABA regulation anymore in the brain, meaning it was very clear that it was signals from gut bacteria through the vagus nerve to the brain informing and instructing the brain to regulate GABA levels in different areas of the brain, to manage a stress response and create a more resilient stress response in those mice.

And that was an incredible study because it just really there's no other explanation for why that happened. Wow. And it would not be ethical to do this in humans, but we can, of course, try some hopefully some correlations or we can extrapolate, if you will, to humans and say that if this is true for mice that share a lot of our genetics, like an alarmingly large amount of our genetics, right.

That we're so similar to other mammals that there is probably a connection in humans that also rings true, right? That having probiotics, consuming probiotics, whether that's in fermented foods or as a supplement, is going to be helpful in regulating our stress response.

And we know that the stress response is directly related to our risk of developing dementia. Oh. Absolutely. And there are connections to new trophic factors in the brain like gdnf decline has a lot to do with cognitive decline and bd and brain derived trophic factor.

These are these then are trophic factors in the brain. Are these things that help the brain be plastic? It helps with what's called neuroplasticity, which is the creation of new neurologic pathways.

And these pathways, when there's a decline in these neurotrophic factors, become more solidified. And that's part of the onset of cognitive decline.

The Gut-Brain Connection Explained

And mental health dysfunction often results from a lowering of these neurotrophic factors. And we do know that there are some connections also between the gut and neurotrophic factors in the brain.

There's been a long evidence of certain brain dysfunction and mood issues with gut dysfunction, a long history of many, many studies show that people with IBS or irritable bowel syndrome have a much, much higher incidence of anxiety and depression than the general population.

And we believe and understand that that's also related to other processes involved in brain degeneration that could lead to dementia, Alzheimer's as well.

And so there's another mechanism with the gut that's really important, which is that we know that neuroinflammation or inflammation in the brain plays a big role in degeneration of the brain.

Inflammation and leads to degeneration. But how does the brain get inflamed? There are lots of ways in which neuroinflammation can happen, but one of the ways that's connected to the gut, since we're on the gut topic here is that cell, the cell wall of gram negative bacteria have something called the polysaccharide in it or LPs.

This is what's called an endotoxin. This if it gets into the bloodstream in the gut, it's okay. But if it gets into the bloodstream and systemically the immune system sees it in the bloodstream, it says this is a problem.

We know if we for example, there are a lot of studies where you can actually inject daddy coli bacteria, which we would normally find in the gut, but that E coli bacteria direct into the bloodstream, injected into the bloodstream, actually creates severe inflammation, including neuroinflammation, including neurologic symptoms, as well as people feeling miserable.

And so we know that gram negative bacteria cell wall have lipopolysaccharide or LPs that make people very sick and create systemic inflammation and neuroinflammation.

And we know that if people have intestinal permeability, if their gut is leaky, if they've had damage to the gut lining or barrier that's supposed to keep those bacteria in there, if the bacteria are escaping into the bloodstream, we see this one of the signs of leaky gut as well, measuring antibodies against the polysaccharide in the blood.

And we'll see that the immune system is attacking it, meaning it is getting into the bloodstream in big amounts and that can happen with leaky gut due to gut dysfunction and bacterial imbalances and overgrowth and infections and

other problems can create leaky gut so that when food goes in, often a lot of bacteria can make it into the bloodstream.

And then that bacteria can cause endotoxin, which can lead to chronic systemic inflammation, including neuroinflammation in the brain that can contribute to mild cognitive decline, Alzheimer's, dementia and mental emotional dysfunction as well.

I had a she was an acquaintance asked me this morning who's a leaky expert and now I can point directly to you say Doctor Nichols in Colorado, he's your man.

So tell us, what do people do? Because what she really wanted to know were and I gave her my $0.02, of course. But what she really wanted to know was, what do I do about leaky gut?

How do I prevent it? What do I need to get rid of? And then is there something I should add? Yeah. I mean, leaky gut is one that's very, very common. Unfortunately, I wish it weren't, but it is.

And there there are tests to look to see if you have leaky gut. But often those tests just tell you that you have a problem that we probably can assume.

A lot of people have if there are other issues present. And so there's underlying root cause testing to figure out why leaky gut might be present. Basically the gut it has these tight junctions.

These tight junctions are supposed to be like a very close together. And only they're these transport proteins that are supposed to let through nutrients. That's good.

You want nutrients to get from the small intestine into the bloodstream, but they're not supposed to let big undigested protein molecules through that can actually lead to autoimmunity, which is another topic for another day maybe.

But then also the bacteria can get through creating this endotoxin here. In these tight junctions, there are nutrients that can help these type junctions.

There are foods that contain those nutrients that can help the tight junctions. However, if there's a problem in the tight junctions, first we have to ask why?

Because if you just try to go look at a leaky gut protocol and you take some glutamine and you take some things that are going to help with intestinal permeability, and you don't deal with why you became permeable in the first place, why leaky gut formed in the first place.

It's like trying to patch a wall that's been water damage while the leak still present. I mean, it's just going to get damaged again. So what I don't recommend is that people go directly to the things that can help repair the gut unless they're also simultaneously figuring out why and addressing that why.

A common reason. Yeah. What are common things that cause leaky gut. Yeah. So so there are some low hanging fruit that I think a lot of people watching this summit are probably not engaging in.

But I have to say them things like alcohol, excessive consumption of alcohol is a big one, very high carbohydrate diets, the latter, refined carbohydrates are another.

We can see a relationship between some drug abuse and intestinal permeability. Even non-steroidal anti-inflammatory drugs or NSAIDs can contribute and and contribute to some of the root causes for why people develop leaky gut.

So that's, you know, thing pain medication a lot of pain medications can contribute. So medication and substance abuse are two big ones that and very poor diet or standard American diet.

Now there are a lot of people who are okay and not abusing substances or drugs and I have a good diet. So what else? Well, we can see an infection like food poisoning, for example.

You just go, you get food poisoning. Everyone's gotten it. And mostly most people have gotten food poisoning at some point. We know that, for example, one of the bacteria, Campylobacter, Jejuni, can produce a toxin called side or lethal descending toxin.

B The CDB for short can cross react with the immune system looking like that toxin looks a lot like zinc healing, which is a protein in the smooth muscle of the intestines.

So the immune system is trying to deal with this toxin that was produced by a bacteria that caused you food poisoning.

What Causes Leaky Gut

Maybe you are only sick for a day, but it released this toxin in immune systems. Trying to deal with that toxin, it inadvertently starts attacking smooth muscle in the intestine.

That smooth muscle is part of the intestinal barrier and it's part of what's called the motility complex. And the motility complex is how your intestines flush bacteria in degree out of the small intestine into the large intestine.

And without that functioning properly, there's a development often times of an excessive amount or an overgrowth bacteria in the small intestine. This is what's called SIBO, or small intestinal bacterial overgrowth.

We see SIBO being one of the big causes for leaky gut. Now SIBO has an infectious cause of food poisoning leading to a cross-reactive autoimmunity leading to impaired motility, leading to overgrowth like I just discussed, or low stomach acid or abdominal scar tissue from surgeries or surgical procedures or Ilio cycle valve issues.

There are many ways in which bacteria can begin to overgrown the small intestine. If we have bacterial or fungal overgrowth in the small intestine, that puts gas pressure in the intestines.

When you're digesting food, normally the small intestine has fewer bacteria, and so you're metabolizing the nutrients. Those transport proteins are bringing the nutrients into the blood, and that's really good.

And it moves through the small intestine and then in the large intestine, there are many, many bacteria that are fermenting and creating gases, and the large, intense intestine is built to handle those gases.

The small intestine is built to handle a more modest level of gas with a smaller number of bacteria. There are still bacteria there. However, when those bacteria overgrow, to an extent, we see that the gas pressure increases.

That contributes to inflammation and swelling, that creates those those tight junctions to to loosen. And it allows for these bacteria and endotoxin to get into the bloodstream and creates many other problems as well.

So SIBO or bacterial overgrowth CFO or fungal overgrowth in the small intestine are two big causes. But then what causes those food poisoning? Low stomach acid, very poor diet.

NSAIDs can contribute high. So proton pump inhibitors or acid reducing medications can contribute to those. And then there are other gut issues as well that we haven't gotten into to parasites and infections and bacteria that are problems so.

Well, antibiotics can cause a lot of dysbiosis in the gut, can may directly contribute to leaky gut. Yeah. So there's definitely evidence of antibiotic use contributing to gut dysbiosis that leads to leaky gut.

So absolutely there can be a connection there and there can be a connection also with antibiotic use leading to a situation where the immune system becomes dysregulated and then we are more susceptible to infections be those

got infections or systemic infections.

So it's sort of like you use 70 to 80% of the immune cells are residing in the gut. So when the gut becomes this biotic, we're not just dealing with a gut issue now we're dealing with a systemic immune system issue, susceptibility to infections.

And we know there's a strong connection between infections and neuroinflammation in the brain as well. And then gluten is another one that I often hear of as directly causing leaky gut or certainly contributing to it.

Have you connected those dots? Yeah. And I would say food sensitivities and allergies are a whole category. And with gluten, it can be a celiac autoimmune issue.

But that's a very small percentage of people, a much larger percent of people having non-celiac gluten sensitivity. And that non-celiac gluten sensitivity can absolutely contribute to inflammation and intestinal permeability.

It just so happens that that that gluten has a very high connection in research with an increase in Xinyu Lin and some of the proteins that are involved in those tight junctions being dysregulated.

So it is one of the one of the prime food sensitivities that we look for and when it comes to initiating the intestinal permeability. So just to summarize, what I got was don't do drugs, probably reduce the alcohol a little bit, maybe stay away from some of the carbohydrates.

And certainly those highly processed carbohydrates and probably maybe even gluten for the most part. And stick to you if you're going to be consuming carbohydrates more like your starchy vegetables and fruits, maybe seasonal fruits, having a diet that's richer in those things rather than packaged processed foods and then avoiding maybe antibiotics and certainly food poisoning.

I think we all do our best to avoid food poisoning, but avoiding that introduction of bacteria that are kind of potentially create more inflammation, more gas, more more leaky gut would be helpful.

Are there other like direct takeaways that you think our audience should start? Behavior change, modifications that we can make today to avoid that could get.

Yeah, absolutely. I think all those things plus looking at polyphenols, polythene, all those have been associated with gut bacterial diversity and repair and are generally well tolerated by even people with some gut dysfunction.

So these are examples. Yeah. These are going to be things that are rich in in phytonutrients. Your brightly colored fruits and vegetables are often going to be polyphenol rich, your your deep colors, your pomegranate, your berries that are deep colors, your vegetables that are a little more on the red side or the yellow or the orange or the purple side of things are going to often be rich in phytonutrients that are going to have polyphenols that are going to really help regulate those gut bacteria.

Some pro and prebiotics can be helpful, although I'll say that if someone has a bacterial overgrowth they may not tolerate prebiotics and that may make them worse.

However, probiotics in the right situation for the right person can be quite helpful. These are fermentable fibers that are sometimes they are carbohydrates, but they're specifically more not absorbing into the bloodstream.

They're more feeding the bacteria in the gut. These are resistant starch and soluble fiber. Some foods that are rich in prebiotics are going to be things like green bananas and plantains.

Potatoes have been cooked and then cooled to make starch more resistant and onions and leeks. And there are several foods that are rich. Lentils are rich in these prebiotics, but the caveat is that some people actually don't tolerate them and it makes their gut situation worse.

So that gets a little complicated without knowing the individual intestine. But mostly brightly colored fruits and vegetables tend to be well tolerated and help.

Fermented foods are a mixed bag. They're mostly helpful, but some people have histamines and activities. Some people have issues with the fermentation and ferment ability in the intestinal tract.

And so those are a mixed bag as well. However, if tolerated, then things like sauerkraut and kimchi that are rich in probiotics can be helpful. And then of course, probiotic supplementation.

Again, a mixed bag in a complex topic that we could go into for some depth can be really important. And I'll say there's a big nervous system connection too.

So doing things we know that we know the nervous system impacts the gut and that's partly the vagus nerve connection.

Diet, Polyphenols, and Nervous System Support

And we do know that there are you don't need any scientific study to ask a person, do you digest as well when you're really stressed out as when you're calm and relaxed and feeling good?

And most people say, oh, yeah, I can I can feel that connection. So being able to to utilize stress management tools and techniques, I, I would say to find what works for people in terms of either breathwork meditation, mindfulness, brain retraining practices, things that are going to a really regulate that nervous system function are going to play a big role in the guts ability to repair itself because it can repair itself to an extent if we remove the problem.

So I don't want people to think that because you have leaky gut, you need something externally necessarily. You actually may just need to remove the reasons why it became leaky and it can repair itself.

The body is amazing at its own repair and if you can really regulate the nervous system function and remove some of those inputs that we talked about and you might still be left in that situation with an overgrowth or an infection that you have to also remove.

And those might not be as easy to remove, but when you remove all that stuff, the body is great at repairing itself. And then if people want to add something to help that repair things like bone broth that are rich in glycine or grass fed college and can be rich in glycine and helpful with that process as well.

And there are some foods that can be helpful in that repair process like okra, that's new salads in this. And so people can start to introduce certain foods to help.

But what I see the mistake is that a lot of people make because they think I am leaky gut, I'm going to go right to repair. Well, there's a reason you have leaky gut.

And if you haven't identified and remove that reason, it's not going to go very well in the long run. I'm so grateful that you mentioned this stress connection, right.

Because it's from the mouse example, right. You demonstrated very clearly that the gut affects the brain. And then we know that the brain affects the gut.

Right. It's bidirectional. It goes in both directions. And so we want to optimize how our gut is communicating with our brain and how our brain is communicating with our gut.

And this mindfulness practice is a it's free, it's easy. It takes almost no time. Right. We're already very busy eating anyways, so why not do that mindfully?

And these small modifications to how we behave each day have a big impact in the long run. And also with the stress, this very direct connection to cognition that we, many of us like stagefright, is a phenomenal example.

Getting having the stress of being in front of people about to deliver a task and forgetting everything right. Like many people have experienced that high stress moment where you can't find your words and your brain stops working.

Well, amplify this over decades, you know, even small chronic stress loads can lead to long term changes in the hippocampus and then physical stress, as well as not getting enough sleep or eating on the go or eating foods that aren't high in nutrients.

All of these things can be both physical and mental emotional stressors that can lead to changes in our memory over time. So thank you for bringing that up and I so appreciate you also giving people some quick things that they can do to help improve leaky gut like the polyphenols, the color rich veggies.

I just have to ask because I'm curious, one of my favorites is aloe like. What are your feelings on aloe juice? Yeah, it can really help with the stomach linings.

We have it. We have a lining in the stomach. We have a lining in the intestines. But those linings are important and can become permeable or issues. And so aloe I find to be very helpful with the stomach lining and also with the small intestinal lining.

So it's I would categorize it more on the repair side of things. So again, got to remove the causes and aloe may not help remove the causes necessarily, although it may be helpful in, you know, some of like H.

Pylori, if that's a cause, that may be helpful. Aloe may be helping to some extent there, but it's usually not enough alone to deal with that cause. But I like aloe.

I like many other things to help with repair. Well, sometimes also dealing with those root causes. And and I'll just add another piece here, which are that some bacteria in the gut can create actual chemical compounds.

So the gut not only does the gut bacteria send signals via the vagus nerve to the brain, not only can bacteria get out of the gut via leaky gut into the bloodstream and create neuroinflammation that can affect the brain.

But also the bacteria in the gut can directly produce compounds and chemicals. And some of those compounds like peptidoglycan, for example, are ones that are involved in brain development, ones that are in volved in those neurotrophic factors in the brain.

So we also and the bacteria in the gut can produce some of their own polyphenol compounds and and some of their own compounds that help to protect themselves as well.

And the gut as well. So bacteria in the gut have varying mechanisms for how they can connect. And sometimes the secretion of chemicals themselves can actually be something that can regulate the brain in a different way as well.

It's complex. Do you recommend that most of your patients, people you work with do a stool test? Yeah, I generally like a breath and or a stool test for almost everyone.

Ideal would be both, but when it comes to prioritization of labs and finances, sometimes we'll do one or the other. But if we're doing anything, even if someone doesn't have gut symptoms and they have not already done recently a blood either a breath test for small intestinal bacterial overgrowth or a stool comprehensive stool analysis, then I highly recommend that that's almost a yearly thing to just be preventive and look and see if something's going on that could be impacting these things that we're talking about because it is so important.

And the bacteria in the gut can be impacted by the bacteria in the sinuses. So I also like to, especially if someone hasn't had this tested before, do a sinus swab to look for bacteria in the sinuses.

Interestingly, if I do a stool test and sign this test, I often find overlap. Like, for example, I might find overgrowth of Klebsiella in the intestines.

Sinus Health and Brain Inflammation

Klebsiella has been associated with certain autoimmune conditions and can be very problematic in the intestines. And sometimes I'll also find klebsiella in the sinuses.

And sometimes people have done multiple rounds of gut treatment and it hasn't gone away. And then I test the sinus and I see it there and I think, oh, maybe it's actually just re infecting the gut and because the sinuses haven't been addressed, we're seeing that gut dysfunction perpetuate even after treating and treating again and treating again because maybe the stomach acid barrier isn't sufficient to completely kill that bacteria and some of that post nasal drip can actually impact the intestinal overgrowth of that commensal or just biotic bacteria.

That's a problem. So testing sinuses can be impactful. And we see a direct connection between some bacterial dysbiosis. This in the sinuses, in the rhino biome, not the gut microbiome, but the rhino biome in the sinus cavities.

We can see a connection there with amyloid plaque formation in the brain and with the onset of dementia and Alzheimer's, as well as a direct connection and then indirectly impacting the gut, that then can impact the brain.

You know, I think some people may go, oh, wait, wait. Like there's this light bulb that goes off, right? The sinuses are connected to the guy. And yeah, when you think about it, they are they are directly related.

Directly connected. Excuse me. So that nasal pharynx becomes that posterior oral pharynx that then goes into the gut very, very directly. And so you make such a great point about looking there and it sounds like you do those nasal swabs pretty regularly.

I tend to wait in my clinic for somebody to complain of sinus symptoms, and then I do it. But you you have me convinced here that gut symptoms might also trigger a nasal swab, that because of that connection, that very clear connection.

So do you have people do neti pots, do you have them do sinus rinses or sprays where I have people swab with kimchee juice and just like introduce that good bacteria directly into the nose.

Usually we want to do some treatment before, but what what are your favorites? I like to, especially in cases where I feel like I usually see people after they've seen three or four or five other people.

So they've been down the road, they've done some treatments, and by the time they get to me, they're usually not just coming in for the first time just starting on this journey.

I like it when I get those people too, because it's a lot easier. But but usually when, when I see something in the sinuses, I'm, I'm thinking, you know, it's and they're pretty hard to treat some of them.

So I like nebulizer thing to get deep in the sinuses deeper than in any pot deeper than some of these other things to get to those back. Sinus walls sometimes can be challenging without actual nebulizer thing.

So I'll use sinus sprays, sometimes neti pot nebulizer thing often. And so my go to treatment involves nebulizer and with compounds like colloidal silver and certain naturally anti-microbial compounds, and then utilizing nasal sprays that have some things that are prebiotic and or probiotic that can help rebuild the bacteria there.

So those are some of the things that I tend to use for sinus treatment. I love it. Thank you for connecting those dots. It's fantastic. I know your background, if I understand correctly, is in acupuncture, Chinese medicine.

And wait, are there specific ways that are unique to that, that Chinese perspective that can be applied to Alzheimer's? Absolutely. There is a very interesting way of looking at cognitive decline and brain dysfunction from a

Chinese medicine lens.

And the Chinese medicine lens doesn't segment in the same way that the Western medical lens does, even though functional medicine starting to bring back that interconnection of of systems.

But there's a strong connection in Chinese medicine between the the brain almost. It's it's interesting because the organs that are talked about in Chinese medicine, the brain isn't one of the main ones that are spoken of.

The brain is more of a a reflection of some of the other ones. And the so that the the liver and gallbladder and detoxification systems often connect.

There's meridians that are go over the head and into the brain that are related to other organ systems. And so there's this very intimate and interesting connection between things like the gut in the brain, the liver and the detox systems in the brain.

Chinese Medicine Perspective on Dementia

And when I look from a functional medicine perspective at the biggest causes for Alzheimer's, dementia, mild cognitive impairment and cognitive decline in general, they do boil down often to their being this neuroinflammation picture and or they're being lowered neurotrophic factors like gdnf and or they're being some cross-reactive autoimmunity against brain tissue or the immune system itself is attacking brain tissue.

And occasionally there's actual bacteria or infectious agents that make their way directly into the brain. Not many cross the blood brain barrier, but a few do.

And when I look from that perspective in Chinese medicine, there's this talk of there being heat, which is very much related to inflammation. So fire or heat, can they talk about liver fire or stomach fire or these other things that can rise and can affect cognition and can affect people's ability to think clearly and can impact brain function.

And and I see that with inflammation. That becomes a very interesting link there to look at that. And then there's a lot around Flamm as well. And we know these amyloid plaque formations, they're kind of this, this, this, you know, biofilm and other substances that are with we we know they're these protective mechanisms that bacteria and pathogens are laying down that are these very hard to get through, even with antibiotics or antimicrobials that are protecting these bacteria and sometimes impacting negatively function in the brain.

Lam Has a very good correlation with the way that the Chinese medicine, ancient Chinese spoke about phlegm being something that can impact a person's ability to think clearly.

So these are two phlegm and or dampness and fire or heat and Chinese medicine correlate very well with some of the big causes of infection leading to biofilm formation and plaque deposits in the brain and inflammation leading to various problematic changes in the brain and brain function.

Fascinating and super helpful. Thank you so much for joining us, Dr. Nichols. It's been a pleasure having you. I want to make sure everyone knows how they can find out more about you and what you're up to.

So my clinic is called Medicine with Heart.

Closing Remarks and Where to Find Dr. Nichols

The website is Medicine with Heart dot com, and that's the best place to find everything else. The if there are any providers or clinicians, there's also a functional medicine training program that's mind body functional medicine, econ, and for everyone else, medicine with Hakam is a great way to connect and find all the social and everything else, and there's the ability to find out more about working with the clinic.

And there's also a lot of these free informational things that blog we post regular blog posts about varying topics

here that might be of interest to people.

So checking out the blog, there can be a great resource as well. And hashtag, thank you so much for your time and expertize. It's been a real getting to know you and your expertize and I couldn't be more grateful for the value you bring around really that this deep understanding of the gut brain connection thank you.

Thank you so much, Dr. Sanderson. And thank you, everyone, for.