Introduction to Cerebral Folate Deficiency

About 75% of children with autism may have cerebral folate deficiency. That is an absolute staggering number. Anywhere between about a third to a half of people who have treatment-resistant depression have Cerebral Folate Deficiency.

And when they add in this calcium folanate or this high-dose folinic acid, there was moderate to significant improvements in their symptoms. about 63.8%, so almost 64% of children who we diagnosed with PANS or PANDAS were positive for cerebral folate deficiency.

And what we see clinically is that when we treat these children with pans and pandas who have cerebral-folate deficiencies, there's improvements in their neuropsychiatric symptoms.

It should be one of the first interventions that you are utilizing high dose flenic acid that's weight dependent for a child with autism in hopes to get more speech and communication, more eye contact, decrease in autism symptoms like stereotopy.

It really can improve quality of life, not only for the child, but for their parents. Welcome to the TBD Fit Podcast on Dr. Talks. I'm your host, Daniel Keeley, and I will be guiding you through this wellness journey in terms of optimizing health and longevity, where we unpack the science, the do's, and everything in between.

Come join us. Look forward to seeing you inside. Welcome back to the TBD Fit podcast, where we explore the clinical tools of science and integrated strategies that help our community reclaim their health and transform our lives.

Today, we are honored to welcome Dr. Lindsay Wells, a nationally recognized naturopathic physician. She specializes in pediatric integrative care with a focus on pandas, autism spectrum disorder, vector borne diseases, and other neurodevelopmental conditions.

She is the former president of the Kinetic Naturopathic Physicians Association and a fellow of The Medical Academy of Pediatric Special Needs. She's also the first author of a recent publication examining folate receptor, alpha autoantibodies, in children with pan-spandas, which is a groundbreaking research condition, as well as a frequent lecture.

And this is how we connected at the Line Bytes conference some time ago. She is the author the children's book, Super Sam and the Battle Against Pan-Spandes.

and the creator of the Well-Minded Moms of Children Facing Complex Medical Illnesses. Today's conversation explores one of most important, often misunderstood, contributors to neurodevelopmental and neuropsychiatric symptoms, which is cerebral folate deficiency, Which I'm super excited to discuss about today.

Lindsay, welcome to the show. Thank you for having me. What led you to do what you're doing today? That's a great question. I was in naturopathic medical school and I in my clinical rotations and there was this teenager with autism and he brought so much joy to everyone that he came in contact with.

So everyone was so excited to have him when he would come into the clinic and just brightened everyone's day. And I remember thinking to myself, if I could work with this population every day, I would be very happy.

and I'd be very fulfilled and that kind of got me down the path of working with children. And I then kind started my practice mainly with general pediatrics and realized I really missed working when children with special needs.

So I changed my practices. I started to work with Nancy O'Hara, who is a dear friend and mentor of mine. and working with children with autism and that kind of morphed then to children, with pans and pandas.

And because I worked with Children with Autism, we were exploring cerebral folate deficiency. This was almost, you know, 10 years ago. and then we started to explore it more in other populations, like children like pans, and Pandas and how that impacts mental health disorders.

Then it kind, of just went from there and here we are today. I want to highlight kind of what your research has brought to the table. So let's start perhaps with defining, you know, what cerebral folate deficiency is.

How is it different from the standard folic deficiency? How do we test for it and how do you treat it? So cerebral folate deficiency just means not enough foliate in the brain.

So we hear a lot about folates, especially when women are pregnant, right? That they want to prevent neural tube defects. You want prevent neurodevelopmental disorders.

And so they recommend that women take a multivitamin. And one of the main ingredients in that multivitamin is folate. Unfortunately, some of standard multividamins and prenatals that these women are taking have folic acid in it, which is a synthetic form of folates that many women and people in general can't process and utilize due to many different factors, including genetics.

Dr. Wells' Background and Path to Pediatric Integrative Care

However, there can be this issue where you do get enough folate in the body, whether you're taking supplementation, you are taking the right form of it, whatever, eating a lot of green leafy vegetables.

But there could be something that occurs, which are antibodies that essentially block the ability to get folated into the brain. That then has contributed to many different things, such as neurodevelopmental disorders.

We see that this is extremely prevalent in children with autism. And so it's estimated that about 75% of children who have autism may have cerebral folate deficiency.

That is an absolute staggering. number, and one that any child who has a diagnosis of autism or if there's a family history of Autism or neurodevelopmental disorders, this really should be explored for that person and ruled out.

And we've been lucky enough now that we can diagnose cerebral folate deficiency through a blood test. Previously, this was only able to be diagnosed and truly still the gold standard is through a spinal tap, which I don't know about you, but it's very rare that I recommend spinal taps for anyone, right?

And so that would just limit the ability for patients to get these diagnoses. But now that we have this testing available, through the specialty lab, so it is an out-of-pocket cost, It's about $250, but it's a very simple blood draw.

It is one tube of blood and an SST tube that's spun and you submit the serum and it can essentially tell if the patient has these autoantibodies that block the ability for folate to get in.

Okay. So that's the testing. And in terms of treatment, you have developed some kind of your own, it's historically prescription-based and obviously is one route.

You mentioned, collaborating with Dr. Marmayahinchi, I believe. Yes. I know you, so what have been you guys developed in term of, treatment and care and support for these population?

So if somebody were to have these autoantibodies, and what we're finding is that it's a non-genetic hereditary trait, meaning that, it is not based on genes necessarily, but it can be passed from parents.

So, if mom and dad have it, they can then pass it because these receptors for the folate are actually found also on

the placenta. They're found on certain areas of the gonads as well for the dads.

And so it's a very vulnerable area there that we see that can be passed to the baby. So if this were to be positive in a child and they were have these autoantibodies, one of the number one treatments is actually the removal of dairy.

Making dietary changes, and I don't know about you, but that is a common dietary change that I do recommend for children who have these complex medical conditions is the removal of high inflammatory foods and dairy is one of them.

But the reason particularly that you want to take this out when a child has cerebral folate deficiency is because there is a very close similarity in the structure of the foliate receptor autoantibody in all dairy products and which come from all animals to our intestinal lining making that autoantibody against the brain actually.

And so it's kind of like molecular mimicry that occurs at this time. We see actually that the most common time for a child to be diagnosed with autism is between the ages of about 12 to 18 months.

I'm just so fascinated that that time that we're told to introduce milk milk to our babies is 12 months of age. And so I really encourage families that if your child started to regress around the time that you introduced milk, you really should be looking to rule out the cerebral folate deficiency.

That is a big piece of it, and this is long-term removal of all animal products. And that's not just cows, it's sheep, goats, donkeys, camels, you know, um, And on top of that you would then put in flenic acid.

So, folinic acid is more of a bioavailable form of folate. So I always tell people we get our folates from our green leafy vegetables, that then gets converted to folicic and then methyl tetrahydrofolate, which is the most bioactive form that the body can utilize and plug into its pathways.

What Cerebral Folate Deficiency Is and How Itu2019s Tested

Now, these antibodies will block the receptors on the blood-brain barrier, meaning it doesn't allow for that methylfolates to bind into the receptor to be drawn into So the body luckily has come up with a really intelligent way to kind of bypass this.

And there are other carrier transports that occur on the brain, such as the reduced folate carrier that transport the folinic acid when giving a high dose into the not being, not working as well as it should because they have the autoantibodies.

And so what you do is you give high-dose flenic acid that's based off of weight, which is two milligrams per kilogram up to 50 milligrams a day. One area that I'm seeing is, you know, high dose flanic acid in prescription form is known as leukovorin.

This has been well known as an off-label use for autism of people in our community and practitioners in out community to help with speech and communication.

This is been brought to light because of what's being talked about in media coverage in the news, which is wonderful that it's been being brought more attention and it is allowing families to know about potential treatment options and to be asking their providers.

Now, if their provider's aren't really familiar with cerebral folate deficiency and they're open to prescribing it, They are not usually prescribing the correct dosage, so it's not therapeutic.

They're prescribing it too low. And in reality, it really needs to be based on that weight at two milligrams per kilogram up to 50 milligrams a day. So based off of frustration of patients not being able to get the access to this folinic acid, which is just a vitamin essentially, We have formulated it in supplement form that can be found and you

can purchase by our website where it's the same form.

And it is calcium folinate and 15 milligrams capsules, which is one of the higher dosage available right now on the market. It has been significantly helpful.

I am really proud that we're able to offer this so that families and children can get the care that they deserve. And they need and really see tremendous, tremendous outcomes from it when utilizing it.

Is there any contraimitation for someone just to take this as a regular form instead of any other form? So no, folinic acid, as I said, is a step up before the methyl tetrahydrofolate.

I actually find that people who have the NTHFR mutation, who are very sensitive to using methyl-tetra-hydrophilate, they tend to tolerate folicicacid better.

But with the folonic acid it really is not so much the form, but more dose dependent. and you really have to work your way up to that therapeutic dose based off of weight.

The reason being is if you start to flood the system with salinic acid too quick, what it does is it enters into the brain and it helps to move the neurotransmitter pathway is quicker.

So your body starts to produce and your brain starts produce more serotonin, more dopamine, and more BH4. Now, what can happen if that happens at too fast of a rate?

Somebody can present with irritability, agitation, or have some trouble with sleeping. And so this is why, again, even though you need to get to that weight dependent dose, you would want to build up on it slowly in order to prevent any of those side effects, which really are not that serious.

You really do know quite quickly, like we might have gone up a little bit too high because of the irritability and the agitation, and you just decrease it back down to the next lower dose.

Everything resolves within 24 hours, then you wait a bit longer, another week or two before trying to increase up again, those symptoms resolve. I do find that this form works really well.

Many people, there are cases where people can't get the testing. Now that can be because the physician won't order it, they don't have access to it. The funding, you know, can afford it and in those cases, I think this is something and the research also supports that it's such a benign intervention with the potential to have such great improvement that you can put this in and just see on a clinical trial if there is improvement or benefit in symptoms.

When looking at the synthetic form of folic acid and some of the foods that are sprayed often varies as a kind of pesticide, if you will. And certain people cannot break this down.

I myself have a 67% reduced capacity in terms of methylation. Something here in the US is we just don't eat the green leafy vegetables, the Oregon meats, Nebraska food family that has this.

Instead, our nutrition is replaced with heavy dairy. which, as you mentioned, the cow milk can cross react with the FR-alpha antibodies and worsen CFD.

Certainly we're understanding that nutrition is instruction. It's going to heal you or hurt you. In terms of CFT, how often do you see the contribution in our mental health symptoms such as anxiety and depression?

Yeah, so there's some research that looks at this, and there is actually some really promising research in terms of treatment-resistant depression and what the research has shown that anywhere between about a third to a half of people who have treatment resistant depression have cerebral folate deficiency.

And when they add in this calcium folanate or this high-dose folanic acid, there was moderate to significant

improvement in their symptoms. And some psychiatrists actually have started to implement, not necessarily flenic acid, but you see some psychiatrist are putting in methyl tetrahydrofolate, which is the more bioactive form, because it has been shown that it can help to potentiate these psychiatric medications, meaning making the psychiatric medication that they're prescribing work better.

And I really wonder if perhaps those people where they are getting a better clinical response by putting in the methyl tetrahydrofolate are the ones with cerebral folate deficiency because yet again, this is very common in people who have mental health challenges.

And so that's just for frank treatment-resistant depression. We've also seen in research that it can be helpful for anxiety. Right now, the research kind of remains with animal studies there, but still, it looks promising.

And then there's been some research in schizophrenia as well, showing that can help with refractory schizophrenia, so when you put in high-dose folinic acid, again, that their schizophrenia symptoms improve.

And then with that, what I was mainly seeing in practice, because again, I'm a pediatric practitioner, and Dr. O'Hara published this study recently, about a year ago, where we looked at children with pans and pandas, we know that those children have neuropsychiatric symptoms associated with underlying infections.

And so those symptoms can be anywhere between, you know, severe anxiety, separation anxiety OCD, intrusive thoughts, suicide ideation, we can have depression there, tics, ADHD type of symptoms.

And so when we looked at this, our study included 50 children and our results were quite staggering that about 63.8%, so almost 64% of children who we diagnosed with pans or pandas were positive for cerebral folate deficiency.

And what we see clinically is that when we treat these children with pans and pandas who have cerebral folate deficiency, there's improvements in their neuropsychiatric symptoms.

They have improvement in anxiety, their OCD, depression, ADHD.

Folinic Acid Treatment, Dosing, and Clinical Response

And most recently, which I'm very excited about and I hope to explore this further and produce some research on this, is with speech disfluency. So I don't know if you've seen in children with pans and pandas where they can have some stutters or they might have more, mutism is one that I see as well.

They might not have a lot of using words in between and not being able to communicate as they would like, but stutterers are a really big one I've see in practice.

I'm seeing significant improvement in speech dysfluency with pans and with stuttering in children in my practice using high-dose fulonic acid, which is very exciting that there's a potential to help because I know that can impact.

It's frustrating for the child and it can also impact their self-esteem, especially when they're in school. So that's one component. And I am currently exploring further the use of high dose fulanic acid and cerebral folate deficiency in Those who have vector-borne disease, Lyme disease Bartonella, Babesia, who has neuropsychiatric symptoms and the results are also pretty promising there as well.

I remember when you had presented and you mentioned, you know, 64%, that to me is quite a high rate. When you mention molecular mimicry earlier on, especially in terms of kind of this classic pandas, we see antibodies that are made against strap, which cross-react with neuronal tissue, particularly affecting dopamine signaling in the basal ganglia.

Let's first identify what pans and pandus means. And then maybe kind of how you're going about treatment. Because for us, what we see there, the root cause is there's a loss of immune tolerance, which drives auto

antibodies, and further exacerbates neuroinflammation.

And now you have neuropsych symptoms. Yeah, so PANS and PANDAS, I'll start with PANs. Pans is Pediatric Acute Neuropsychiatric Syndrome, and this is like an umbrella term, okay?

So under this category I put P ANDAS which is pediatric autoimmune neuropsychiatric disorder associated with streptococcus. So essentially what this, is by definition, it's a pediatric disorder.

where a child gets an infection, I'll stick with pandas, which is say a strep infection. And after they get that infection they start to present with neuropsychiatric symptoms.

So it's an acute abrupt onset of OCD or other neuropsych symptoms like restrictive eating and anorexia. There can be anxiety, there can tics, behavioral regressions, sleep disturbances, hallucinations, aggression, just essentially where the parent is stopped in their tracks and is like, oh my God, my child is different.

Like overnight, there was a significant change in them. And it is driven by an underlying infection that's creating neuroinflammation that then presenting with these neuropsychiatric symptoms.

So we hear a lot about pandas because that's associated with strep. And I think that the one that, you know, most people have heard about and understand.

But there is this umbrella term, as I mentioned, pans, which can occur from other infections. Mycoplasma being, the second most common after streps, on which I see very frequently in our office.

viruses, including COVID, as well as other bacteria. I personally look for vector-borne diseases, Lyme disease, Bartonella babesia. Technically, it's no longer in the diagnostic criteria, but I think that's mainly due to political reasons more than anything else since Lyne and other vector borne diseases are still controversial as is PANS and PANDAS.

But we also know that there are some non-infectious triggers as well that can contribute to pans and panda, or mainly pans here. And so that's something that, as I mentioned to you before we got on, that I will be lecturing at with the, at MAPS, this upcoming spring conference, I guess, on the non infectious triggers for pans, and pandas.

In terms of mycoplasma, which obviously becomes common. How are you testing? How were you treating? So with mycoplasma, what I do is I look through the blood.

I'll look for the antibodies, IgG and IgM. And I believe that the Igm is when we see that that's contributing to symptoms. Many people will have elevated Igg, which just means a previous past exposure.

That I don't see so much contributing to symptoms. Usually there's some other type of infection going on there. There have been studies, a more recent one actually that was done that looked at mycoplasma IgG elevation associated with ticks and Tourette's.

So perhaps if I have a child who has a lot of motor ticks or vocal ticks, and they have like a very high myoplasm Igg, that's then when maybe I'll address that.

But otherwise, I really only address it when I haven't elevated IgM. or a more recent diagnosis of mycoplasma or pneumonia that the child was treated, but then has psychiatric symptoms afterwards.

I will utilize antimicrobial herbals, which is one of the modes of treatment that I use. But of course, people can also utilize some antibiotics as well, like azithromycin.

Any specific herbels? Yes. Yeah, so the herbals that I like to use for mycoplasma are, one is goldenseal or using berberine, the constituent berberein there.

I use Hatunia and as well as Isatus. Those are my three that i usually use. And then I really talk to parents about increasing extra virgin olive oil.

as olive oil has been shown to have anti-mycoplasma benefits, as well as pomegranates. So I will encourage consuming pommegranate or using a little bit of pommagranate juice maybe as the vehicle to get these herbals in.

I do use herbal glycerates, again, mainly because I work with children. And, you know, mycoplasma is a pretty stubborn germ. I say don't expect for it to be in completely normal range if you were to repeat this testing pretty quickly after you implement antibiotics or antimicrobial herbals, but you should start to see a difference after a few weeks of putting in the antimcrobials.

Some of these microbes and in general, with molecular mimicry, means system mistakes, antibodies, and often the basal ganglia tissue for the pathogen.

So it binds to dopamine receptors and to the glands and disrupts motor control, motion behavior. And you see this sudden onset, which you're rough to see.

There's a huge breakdown in the blood brain barrier. Obviously, you know, that starts also in, the gut, but certainly leaky gut and leky brain and vice versa.

So there's cytokine surge and mast cell activation. There is chronical inflammation, mycotoxins, which at some point, I know we're going to segue into tier two.

We see a, huge prevalence now of environmental toxins. How are you testing for Lyme? How often are finding success in testing, for lyme and finding it?

Yes. So Lyme can be frustrating to test for. There's many different types of tests that you can look at. Unfortunately, I really use a lot of specialty testing rather than using the standard labs because I find them extremely unreliable and very insensitive, meaning that there's a lots of false negatives there.

And so I will use specialty labs. I really, really look and dig deep to find Babesia and Bartonella. Those are the two that I find to be most prevalent in my children with pans and pandas and also autism.

Cerebral Folate Deficiency in Depression, Anxiety, and PANS/PANDAS

Now, when I first started my practice about a decade ago, I thought, you know, Vector-borne disease was totally separate, and autism was over here, but it has been alarming, the overlap between them.

And so every single child, again, I was saying you need to test for cerebral folate deficiency if they have autism. I strongly believe you to be testing for these vector-born diseases.

And I'm not quite sure what's going on, but I see a lot of Babesia and Borrelia burgdorfi in children with autism. And then in my children, with PANS, Bartonella is extremely prevalent.

So Bartonella is a bacteria. It has many different vectors, eight different factors, including mosquitoes. I mean, who hasn't been bitten by a mosquito before?

And this can cause a lots of aggression and rage in. children. and I believe that all children they want to be happy. They want to be joyful, they want do the right thing.

They wanna please others. they wanna behave. So when you have a child that is angry, defiant, aggressive, you gotta look deeper there. Like they don't wanna feel that way.

And this is one germ that really can be a contributing factor. I'm on the East Coast, I am here in Connecticut, so it's prevalent, but I see people from all over the country.

I would say I test them. It doesn't matter where they live. I feel like everyone is at risk of exposure for these vector-borne diseases. And when somebody says, I've never found a tick on my child, it's I always tell people I'm more concerned about the ticks I don't find than the tics I do find.

If you did find a tic, you would have brought them to the pediatrician. You would've monitored them, maybe you'd have done some antibiotics. but these are so small, like the size of a poppy seed, and also we're being infected other ways.

It's not just through ticks. And if you say, oh, I've ruled out Lyme disease, but did you rule out Babesia? Did you roll out Bartonella? And that's a question and something I encourage people and pretty much everyone that comes to my office, we are having that conversation and the majority of them are um, tested for that.

And, you know, myself and my co- a few of my colleagues, including Dr. O'Hara, we are exploring to hopefully get some research out there in terms of Bartonella prevalence and pans and pandas, because this is what we're seeing clinically and people need to know about it so that other clinicians are also looking for it.

In, in, terms, of testing, I think you mentioned specialty testing. Any that you find, uh, noteworthy more so than others, which achieve a higher detection.

Yeah. So I, I utilize Galaxy. I use Galaxy for Bartonella testing in particular, but then I used a lot of igenex. They use their immunoblots, igenics, and I also use there fish testing.

And I've been having just, you know, in the past few years, the Babesia fish is coming back pretty positive. and so those are the two companies that I utilized the most in my practice.

But there are some other ones that people will use like MDL or T-Labs that also have some, some. I think are very trustworthy as well. If you can tell, I did not mention Quest and I didn't mention LabCorp.

In terms of treatment then, where do you start? Say a patient comes in, one of these children, you find a positive test. Where do start with treatment?

How long does the treatment typically last for you? I know it's case dependent, but in general, Yeah. So I always tell parents like, we're treating a minimum of like a year or two.

My kids, they usually clear the infections sooner than my adults. And I just tell like as adults, We have X amount of years of junk built up in our system.

We've probably had these infections for an extended period of time when children, I feel like their bodies are just more resilient. So I only test once a year.

And most of the time, again, we're lucky if only one infection comes up. Usually it's a few infections. So, I like to see just some infections being knocked down.

But it is a minimum of a years, but don't be surprised if it two years or more. I also can't promise that you'll never be reinfected. That's also part of that issue with these infections, unfortunately, because I feel like they are So incredibly common and kind of ubiquitous out there for all of us.

So that's how, how I go about treatment. I use antimicrobial herbals. Again, I feel very confident and comfortable using them. I don't see a difference in when somebody, and my children in particular, who have Panzer Pandas or other chronic challenges, that there is a different in their outcome between using antibiotics and using antimicrobials, meaning they dont achieve the outcome sooner using the antibiotics, it does disrupt the gut microbiome.

A lot of my children have yeast overgrowth where that becomes an issue. So I really try to, my goal is always to keep kids off antibiotics is I guess what I'm trying to get at.

We use antimicrobial herbals. I use glycerates. For herbals, actually, it's called well supplements where it is all the antimicrobials that we use in my practice.

And so I have some popular ones like Japanese knotweed, of course, Crypto Lepus, Cat's Claw, Chinese Skullcap, Hatunia. So I usually go that way. I'll put in a binder, help to support the immune system, detoxification pathways, and also I will have symptoms support in there.

Because as we treat, as it takes a long time to treat we want to see The symptoms getting better. And I usually tell people within three months, we should be, should we be making progress here, knowing that we're on the right track.

In terms of dosing, some of the glycerin is quarter tea. Obviously it's weight dependent, but a couple, one teaspoon, quarter teaspoon few times a day.

Yeah, so ideally you want to do it throughout the day just because of the, you know, the half-life of these herbals, right? And so, ideally it's three times a day.

I am more successful with my families with twice a, and that's okay. Um, I always tell my family is like, my goal is to not make you more stressed out, but just know it might take longer for treatment that way.

And so I do do it dose dependent based off of weight. And, so it really, it does depend on weight, if somebody's over 150 pounds, then I use 30 drops as kind of my gauge there.

and we dose that, as I said, at least twice a day. So, and usually you're using kind of the, the glyceris, then for all, so Barnella as well as. Yes. Irelia, same kind.

Yeah. And multiple, you know, there's not just one herb, um, usually they're on a few herbs depending on the infection.

PANS/PANDAS, Mycoplasma, and Vector-Borne Infections

Um, I also like doing artemisia pulsing around a full moon. Not sure if that's something you integrating as, well. Yeah, so it depends if somebody has Babesia and they're presenting with the neuropsychiatric symptoms or they do have signs of Babiesia like in perspiration at night or air hunger.

If they have headaches, what I will do is I'll do three months of it being daily and then I would switch to it around the full and new moon. So it's 10 days total out of the month, two days before the day of and the two days after, around the new moon and the full moon.

We go about it that way because Babesia is a parasite and parasites, their life cycles are around full-moon. And I find that artemisia is very well tolerated in my children who have underlying parasitic activity, including Babiesia.

Yeah, similarly, we'll go to about three to four months, but the treatment plan will often last around nine months. Definitely everything is case dependent, that certainly makes sense.

In terms now of environmental toxins, mycotoxins, how often are you testing for that now and how are are seeing that as a trigger or kind of another piece of this puzzle, growing puzzle?

Yeah, so mycotoxins is another one that I will look at very frequently in my practice. And the main time I look for that is when I have a child or a family coming in and the child doesn't have the classic presentation of this relapsing and remitting pattern of pans and pandas, meaning that they have an exposure, they go into a flare, and then after a period of time, the kind of get back to baseline.

In my practice now, I think our kids are getting much sicker since I've started my practise. I don't see that relapsing and remitting pattern as much as I used to see.

What I see now is more that every single day is a struggle for these children, that they have daily symptoms and I call them constant flares. And so if I have a child with a constant flare coming in, and usually say it's one of three things or more, then I guess it could be all three.

I have to look at that, but yeast overgrowth, vector-borne disease, as we mentioned before, or mycotoxin illness. And so again, if a child isn't going back to baseline and every day seems to be a challenge, I will absolutely be looking for mycotoxins in the urine.

But I also ask in my history taking too, right? Like has there been any exposure to mold, any water damage in You know, is the symptoms worse when they're home or when their away and kind of exploring that environmental history that they've had, the different houses they lived in, even mom, right?

Because we've seen that mycotoxins actually can pass from the placenta as well. So with that, you know I do think we all are exposed to mold in some capacity, but there are different ones that can contribute to neuropsychiatric symptoms and it absolutely plays a role in our children with pans and pandas as.

And autism, by the way, there is some research there as well with mycotoxins for autism. And that's one that is very difficult to detect because most, most parents, they don't recognize it's very, difficult, uh, any sort of mold growing.

It's often behind walls, um, and sort, of water damage. Very, very difficulty to attack and most. Parents are just not. in the knowledge of when you move into a home, the existing water damage, right?

Or in a condo or renting an apartment. Certainly landlords aren't necessarily quick to fix a problem that's not seen. So this is one that I'm finding more and more prevalent versus the others.

You have a very kind of distinct symptom pattern. This one, as you said, it's more kind now persistent and especially triggered in specific environments.

When you mentioned autism, So obviously you're integrating the flenic component. What, what else, how often do you see heavy metals? How often are you testing for heavy medals?

What else are seeing that's kind of very common in terms of this now very quickly growing neurodivergence population, which almost estimated it close to one in six kids.

I mean, it's absolutely remarkable. Right. And so, you know, when I have a child with autism, I kind of think of it in different categories. I will look and explore the gut because we know that our children with Autism, their microbiome is just different than their neurotypical peers.

They tend to have more yeast overgrowth. they could have Clostridia, other bacterial burden there. So that's a really big one, especially with a trial that has some self-injurious behavior.

it's important that you look at the gut and want to make sure that their bowels are moving also efficiently. I also look the mitochondria. So it is estimated that about 65 to 85% of children with autism have mitochondrial dysfunction, not mitochondrion disease, but dysfunction.

And so that can be an area to look. At I will look immune system, which I then categorize that with the infections that I had just mentioned previously.

And then I will look for detoxification. You had mentioned heavy metals. Heavy metals, I don't look at that commonly. I think it's, unless I have an adult with autism, the burden there was a bit more in my adults more than the younger children now.

However, we'll look acute exposure of metals meaning within the last four weeks or so through red blood cells. That then tells me there's something going on in the current environment in order that we need to make some changes.

But there are some kids, I'm really taking their history. And I do think that there's a heavy metal burden. Then we do a pre-provocation test and a post- provocation through the urine and see what they're excreting.

You mentioned the microbiome, which has been my kind of clinical focus for almost a decade now in terms of practicing and understanding microbial medicine and how that's evolved and now we've been able to sequence the bacterial genome and really just crashing the surface of the mycobiome.

In terms the signature. For ASD, what I find is beyond what you shared. Also, there's a stark difference in terms of their reduced diversity, whether it's, a differentiation in the lactobacillus or Clostridium dysphilibria, which we see, certainly Acromansia, Cetralysia and Tobacteriaceae.

There's huge decrease in that for Mycides and Bifidobacteria species, Previtalia. So there's a huge hit in terms of our microbial population. And that's, I think, often one of the most overlooked components.

I know you mentioned Clostridium, obviously, as being another core piece of a puzzle. In particular, how they're producing short-chain fatty acids and metabolites that are potentially toxic to the mitochondria, which obviously interplay.

The overgrowth of specific species that we named will definitely create this heightened sense of inflammation, oxidative stress, and then neuropsychiatric symptoms or neuroinflammation and obviously cognitive deficits.

What else are you doing to integrate treatment? I know you mentioned Avesia, obviously treating that with very specific herbs and cleaning the gut, working on detoxification, supporting the mitochondria.

Anything else particularly or like specifically that you found that have been very big wins in terms of this population? You know, one thing that I utilize and I find can be a game changer is helmet therapy, the use of HTCs and my children with autism.

I will also use it in other children, with complex medical conditions that works directly on the gut. It's based on. Hygiene hypothesis that. As we have become more hygienic as a society, the rate of autoimmune disease has completely paralleled that.

Lyme, Bartonella, Babesia, and Long-Term Treatment Strategies

And so that's a much bigger discussion, but I would say that is, you know, one of my bigger interventions that I will utilize for the gut that i find to be significantly impactful actually for cognitive gains, attention, focus, decreasing OCD, anxiety, improving sleep, and also just helping to regulate bowel movements as well and therefore decreasing the aggression, the self-injurious behavior.

And we do see a difference in the microbiome when we test for it pre and post. It is an intervention that You have to continue to do though, because it doesn't stay inside of the system.

It never breaches the gut lumen. And so with that, it passes physiologically within about two weeks. So you have dose every two to three weeks in order to maintain the benefit.

But that is one that I also… Where do you source that? We have a lab here on the East coast in Sag Harbor. Yeah, so the UK, as you know, like these are live organisms, correct?

And so when they have to travel and they to go through customs, there can be challenges. I don't find that as effective because some of them may have died.

So getting them from a local source where it is then delivered overnight on dry ice and taken within 24 hours, you're going to get the, it's going be the most effective and robust response.

Okay, so in terms of then the ASD population, any other kind of clinical pearls, obviously you mentioned Hellman

therapy. You're very comprehensive kind in the terms the structure and support.

Anything else in in, in term of things that move the needle very well there? Yeah, I mean, just circling back to the beginning of our conversation with thalenic acid, that that one has to be utilized.

It has be implemented in a child with autism. And so what I tell parents is you have to go up to that weight-dependent dose, so it's therapeutic, and give it a little bit of time.

So I told people once they get to their therapeutic weight dependent dose you're doing it for at least three months, up six months just to see what gains we can get.

And if sometimes parents will say, I didn't see enough on, that's okay. We can wean it down. And they quickly realize, oops, yeah, we did see a lot of gains using the folinic acid.

So they move it back up to that weight-dependent dose. But in my opinion, Before anything else, it should be one of the first interventions that you are utilizing high-dose flenic acid that's weight dependent for a child with autism in hopes to get more speech and communication, more eye contact, decrease in autism symptoms like stereotopy.

It really can improve quality of life, not only for the child, but for their parent as well. And in my opinion, there is nothing better. than hearing, like, a child with autism's voice to hear them speak, you know?

To me, it's like I get chills, I love it. I tell parents, send me videos, let me see, and to have them come in and be able to respond to my questions, to look me in the eyes, tell their mom and dad for the first time that they love them, or to say that mom or dad, that is life-changing, That's why I'm in this field.

That that's, why do what I do every day is for moments and stories like that. And for these kids and these families who deserve so much more than what, I think the traditional medical system is providing for them.

And I had a patient with a parent in there the other day, and so we'll also integrate oxytocin intranasally and this remark, see kind of how love, connection, bonding, friendship, all that integrates overnight, which is usually very deficient in this population.

And so, we can make these big wins very, very effectively. went on the right treatment plan. And I was looking at the serum folate receptor autoantibodies.

Any, any reason that you wouldn't administer this before even receiving the results of a test? No, I have put, you know, these, unfortunately this test now, because it has, there's been some viral videos, and you see it in the news about children with autism who have started speaking after implementing high dose, folinic acid in a very short period of time.

There's only one company that tests and now the testing to get the results back is taking a long time, up to 12 weeks. And so I don't want to lose those 12. You know, by the time I get the test results back, I could already be on full dose of the flenic acid to see if the child is responding and getting gains.

And, you know these parents have waited. three years, five years 20 years to get more from their child. I don't want to waste another three months. And so I will start treatment if I feel very, um, you know, uh, confident about it.

and also of course, in agreement with the parents. So many parents coming into my practice are very well-educated. They have done their research. they have looked at lucavore and they tried to.

High-dose flenic acid and other ways they had read the research that I've written and They're coming here because they want to try it and so we start as soon as we can.

In terms of the future, what else are you working on? Where do you see things are going in terms science, research, anything else that you and Nancy are working or anyone else?

Yeah. So I have a few projects going on right now. You know, Dr. O'Hara and I are really passionate about getting education out there in regards to pans and pandas.

And again, to help these families get the diagnosis quicker to implement treatment sooner. One of the big things that I think we're very good at that maybe others aren't looking at is vector-borne disease in pans.

As I mentioned previously, Lyme disease used to be part of the diagnostic criteria. It was part the 2012 white paper, but it has since been removed.

Autism Care: Gut Health, Mitochondria, Toxins, and Folinic Acid

I'll speak for myself, I think Dr. O'Hara would feel the same way. We are passionate about getting that back into the diagnosis criteria, so right now we are just exploring the prevalence of Bartonella in children with PANS in hopes that that will then, you know, change the diagnostic criteria, have more physicians looking at that, and then that's just the start.

Who knows where we'll go from that. But then I also have a very big passion of cerebral folate deficiency because I have seen the change it has made in the lives of many of the children and families that I work with.

And so I don't think it's isolated to children autism as we see that it is in Children with And now we are exploring it in children who have vector-borne disease and the results are pretty.

It's a pretty elevated number, so I'm hoping to get that research out this year and in 2026. And then from there, some more key studies, seeing how flenic acid can help with symptom support.

So not just the prevalence, but more of like applying it clinically and what we're seeing for outcomes there so that more physicians will be comfortable utilizing this treatment again, just to.

Get these children support and these families support because, you know, I really believe that these illnesses, they're not just pediatric illnesses. They're family illnesses and when your child is sick, it impacts the whole family structure.

So I'm really passionate about just getting more information out there. When I published the first study, I said, "I'm never going to do this again," because it was so involved.

The research and the publication, but I feel deeply that I we need to get the information out from what we're seeing clinically. And that's how we then share and educate other practitioners and help families that we don't get to see in our office every day.

So I applaud you, your work. Obviously, I'm excited what you guys are doing and the team you're collaborating with. The numbers are alarmingly positive.

Yes. It's estimated that one in two kids have at least one chronic health condition. That is remarkable. This is a familial history that's often, I think, overlooked.

And then you compile the environmental toxin exposure of which we reside in, and now you have this. form of symptoms, if you will, or perfect storm of dysfunction, which I want to instill hope because all of which largely is reversible with the right treatment plan.

So where can people find you, reach out to you follow you? Yeah. So I have a practice in Trumbull, Connecticut. I had my website, lindsaywellsnd.com. And so that's where you can find me.

The last question that I end up every episode is if you could have one superpower, what would it be? If I could have one superpower, that's great. You know, what just came to mind is read other people's minds, I guess, if I had that superpower.

So I'll go with that. If you were to ask my son what he would want, it would be to be very fast, like the Flash. Speed always wins. That is wonderful indeed.

Learning to learn. Yes. Nonetheless, again, I appreciate your time today. For everyone listening, please like, review, subscribe. Please share this with anyone that you feel can benefit from our conversation.

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