Introduction to genomics and Alzheimeru2019s risk

Welcome back to the Reverse Alzheimer's Summit. I'm so excited to dive deep into the genetics that determine our risk for dementia. Doctor Sharon Husband Cohen is the chief medical officer and co-founder of Intelex DNA and Resilient Health in Austin, Texas.

Doctor husband Cohen has been in the fields of integrative medicine for over 25 years. She and her co-founder developed Intelex DNA as an answer to an unmet need in the integrative and functional medicine community.

The need for accurate, even an evidence based genomics tool geared at helping functional and integrative physicians practice personalized medicine. So many of us talk about this, but actually having the tools to do it is so important to making it happen.

They envisioned and created a tool that could help identify root causes of cognitive decline, environmentally acquired illness, and other chronic illnesses, and one that could also help clinicians know how to address these genomic factors with lifestyle, diet, supplements, and occasionally even medications.

The Intelex DNA clinical Decision support tool is now being used as an integral part of medical decision making by integrative and functional medicine clinicians across the country.

Intelex DNA is also the genomics used in the study that is currently pending publication. Dr. Dale Bredesen and his colleagues doctor has been kind. Thank you so much for taking the time to join us.

Welcome. Thank you so much for having me. So I want to dive right in. How does genomics differ from genetics? Well, that's a great question. And genetics tends to refer to kind of large genetic events.

And so let's go back a step in this. If I can share my screen for people who have visual, I'll kind of put up a few visuals as I explain this, because genomics is a little different.

Beautiful. Okay. So with genomics you're looking at your genome, which is your whole collection of your DNA. And it's kind of like your user code or your manual.

So when we have a little bit of a change in your genome, it doesn't cause the disease, but it can contribute to a disease. So genetics is the study of heritability.

You know, you get this from mom and this from dad. But genomics is looking at those very tiny little changes. Alzheimer's is not a genetic disease. It's not.

You get one gene and then it's inherited from mom or dad. It's caused by many small changes in combination with environment, lifestyle, diet. But before we kind of go into that, let me just kind of explain the genomics a little further for people who where it's been a little while since they've done their basic science, which is usually like high school when you learn about DNA.

Of course, now maybe it's seventh grade or something. But if you think about DNA, there's these four letters. They're called base pairs, and it's that double helix that makes up your DNA.

And some of you might have done, you know, 23 in May or a different kind of genomic syncing. OGs and C's and A's and T's. And those are the four letters that are the building blocks of your DNA.

And you've got about 3 billion of these letters in your DNA. But every now and then, about every 100 base pairs a letter might get swapped out. And that's called a snip, a single nucleotide polymorphism.

A lot of these snips don't matter at all. You could not tell a difference at all. Would that you have them. But some of them have effects. Sometimes the effect will be something like whether you have curly hair or straight hair, or blue eyes or brown eyes.

But other times the effects can have a bigger effect.

How genomics differs from genetics

So if you think about snips as being the equivalent of changing one word in a recipe, it's kind of like the equivalent of you take change blend to start.

No big deal. But you change bake to broil and that's a really big deal. But the ones that we're going to look at or talk about, as you and I have a discussion, relate more to things like transporting vitamins, across the blood brain barrier into cells, the different enzymes that break up amyloid, the growth factors that allow the brain to repair the cytokines, which means inflammatory markers.

Because of Covid, people have heard of cytokine storm. So those inflammatory storms that can cause too much inflammation. Things that relate to hormones and detox and cleaning up the body.

And, you had said we're going to talk about, like, the genetics that causes Alzheimer's. And I think that the really important thing before we kind of dig into the cases is that is that none of these genes cause Alzheimer's, none of these snips cause Alzheimer's.

They all just can slightly increase to the risk. But they're all modifiable. And that's what makes it so exciting is because if you can identify that you're someone who needs more choline.

Well that's easy. You can get it from your diet, or you can take supplements. That's great. Thank you for that. That nuance there, that it isn't genetics that cause Alzheimer's, but maybe create a different risk and that there really are actionable things, right?

It's not a direct cause. So it's just a predisposition. And that actually gives us agency that gives us something that we can work on. And maybe we do have to work a little bit harder than our neighbor or our spouse, someone who's genetically different.

But it's not a death sentence, right? It's not a for sure thing. It's just more of an invitation. Maybe, to start to look at what are the diet and lifestyle and supplement and maybe medication inputs that I can use to make sure that the cards are maybe stacked in my favor a little bit more.

So really, what does the DNA tell us about getting Alzheimer's? Well, I think that the classic thing that people worry about is, they'll have heard of ApoE4.

But that's only one of these many, many holes that we're looking for. So for those of you who have read and of Alzheimer's or heard Doctor Bredesen speak, who really is the father of the field of reversing the idea that we can reverse cognitive impairment, he talks about, you know, initially he said 36 holes in the roof is probably up to more than 50 now.

And what we're looking for in the genomics is a little bit more specificity. So things that we can get information about relate to things like inflammation.

Can you clear amyloid. Well do you make enough of the growth factors mitochondria toxins. Do you not get enough oxygen to your brain because your arteries are clogged up with cholesterol, or because of the blood being too thick?

Things related to blood sugar. And ApoE4 interacts with most of these. And we'll talk a little more about empathy before. But all of these little things relate to snips that we can identify and then respond to.

That's great. And then can you give us some examples of what exactly like so ably for let's break that down. Can you tell us what that because everyone is so.

Well, not everyone, but a lot of people are more familiar with that connection to Alzheimer's. So can you tell us what that would translate into? Absolutely. And one thing.

So we're going to talk about it before. And it really is important because it's considered the main late onset Alzheimer's dementia risk factor. So that's what Load stands for.

And it has a high magnitude of risk if you have one copy of it it can increase the risks 2 to 3 fold, sometimes four fold. It depends on what it's in combination with.

If it's in combination with other things, it might be even as high as six fold. If you have two copies of it, it might be four fold to 12 or 13 fold, but it's found in 16 to 20% of the population and not every.

The thing to know about not everybody who has AP four is going to get dementia. Because there are also gene variants or these snips that can help be protectors.

And so that's one thing why I think that if you only know your ApoE4 status, that's really not enough information, because you might have things that lower that risk significantly and you might not need to do every single thing that you've read about.

If you've read the different books on, you know, ApoE4, or you might have some things in combination that make you have even higher than average inflammation risk or nutrient deficiency risk.

And then you might have to work harder. But this is a little variant that's found in about 20, you know, 15 to 20% of the population. It depends on what ethnicity you are.

But in people who develop Alzheimer's before age 80, about 70% of them have an AP four. So that's why people sometimes call it an Alzheimer's gene and accounts for about 65% of Alzheimer's.

And again, it depends on the study because of ethnicity and other things, but it ranges from 40 to 80%. But what actually is this amyloid and why is it such I mean, this ApoE4 and why is it such a big deal?

And I you notice if you can't see the slides. I've circled Doctor Peterson's name here before. Doctor Bredesen was traveling around the world teaching patients and physicians alike about Alzheimer's.

He was a researcher in a lab at UCLA, and part of his work showed that ApoE4 was what we call, a promoting, factor. So it binds to the promoters, which so think of a promoter is next to your genes.

You don't want your genes on all the time. There's little on off switches. So we have these factors that bind to the promoters and help turn on and off genes.

Will ApoE a for the reason it's such a big deal is it turns on and off. It helps regulate 1700 different genes. So that's why I tell people who have been before and are starting to have cognitive decline, we can most of the time get you much better.

If not, well, but we can definitely do things to get improvement. But we're not doing it with one pill a day. It's going to take diet, lifestyle, you know, including, things like exercise, getting good sleep and different kinds of supplements, all these different things together to get you well, because for example, ApoE4 can make you not use sugar as a brain energy source as well.

So you've got to know that carbohydrates and sugar, and if you're already having cognitive impairment, get into ketosis to give your brain a different energy source.

You have more inflammation. So we need to do things to address inflammation. You have less growth factors. Things like intense exercise can up those growth factors.

And it goes kind of on and on. But does that make sense as to why now an AP four can't get by with one little pill box once a day? Absolutely. What I tell my patients, and I'm really curious if you agree, is if you have a belief for basically in our ancestors may have been actually protective because it is anti-microbial in nature and and that has protective properties.

And now in our day and age when we have the inputs of toxins or other infections, maybe our immune systems run down from stress, are not getting great diet because of our genetics.

ApoE4 and other risk-modifying gene variants

If you're an AP sport, you're going to have a propensity towards more quickly developing the plaques and tangles and kind of things in your brain that may be contributing to cognitive decline.

Am I explaining that right? I think that's perfect. Yes. And so yes, you'll get more neuronal toxicity. You'll not be able to have proper blood, you know, brain sugar instead of blood sugar.

You don't clear the amyloid, you get more neurofibrillary tangles, all of those things. So then the question is what, of course can we do about it? And I'm not going to tell you everything an AP four can do today because we don't have enough time for that.

But for example, if you know you're an AP for ashwagandha is one thing that you can do because ashwagandha can help to remove that amyloid beta. And so it and the you can get increased expression of the protein that helps to clear amyloid beta within two weeks of using ashwagandha.

And it can help promote some of the nerve growth, even if you already have some amyloid beta induced neurogenic neurodegeneration. So there's lots of that's just one of dozens of things you can do, if you're using genomics to try to decide what to do, you want to make sure that the supplements that you're talking about also have trials showing not only that they work on a particular snip like, oh, this decreases TNF alpha or this decreases violent, you know, L1 or affects that, but that they also cross the blood brain barrier.

So that's another really important thing. And ashwagandha for example does meet that criteria. They have done human trials showing it improves cognition because you could have a supplement, that doesn't cross the blood brain barrier, and it might affect those genes in the periphery, but it wouldn't affect it in the brain because of that.

Now and then, ApoE, another one we talked about is, is the regulating of the growth factors of the brain. Well, there's one called Bdnf and AP for makes it so you don't kind of convert the pre the pre form to the active form.

And the pre form doesn't help the nerves grow. In fact if anything it makes nerves retract. But the mature form lets you have more nerves grow. Well what do you do if you have either ApoE4 or you have these Bdnf snips.

Well you can exercise and dramatically increase it. So not everything. It's not like one gene, one pill. You have to kind of understand how the genes work.

And then you do the different lifestyle. And then, you know, there's like I said, you can go on and on. There's so many different interventions. And, can I mention one other fun, really fun intervention that's good for a boy force basis?

So, TNF alpha goes higher in ab force. And although we don't have, lion's mane mushroom here in Austin, for those of you in California, if you go to a farmers market, you've probably seen those big, beautiful mushrooms that are, like lion's mane.

They supposedly taste a little bit like crab. I haven't had them raw, only had them in jerky form. But in a study done

in Japan where they're grown, very prevalently, they did a study where they gave lion's mane mushroom and it was like about a gram of it twice a day.

That kind of worked up. And they had at the end of the study, it by 12 weeks, more than 90% of the people in the study had at least two points of improvement in their equivalent.

It was a Japanese equivalent of a mocha, and 70% of them went up three points. So that's better than any drug that's ever been approved for cognitive decline.

The thing is, when you stop taking it, it goes away. But lion's Mane mushroom is great because it improves growth factors and it decreases some of those in brain inflammation markers like TNF alpha.

That's an impressive that's an impressive results. That's incredible. And so what I thought is so it's obvious so is before there's tons of stuff about what to do about it.

But I thought it might be fun to go through a couple cases about what do you do if you're not a before and you're starting to have memory problems, or even have some early dementia or moderate, I'm like, yeah, let's dive in.

Okay. Because yeah, it's if you're an AP for genomics still really helps because you can see, you know, again you still know there's AP for but there's other things.

And you can look at the different nutrient snips and inflammatory snips in the detox snips. But we're really genomics also could be very helpful. Is the person who doesn't have a boy before because then you're like, well, this is a blank slate.

I have no idea why they're having cognitive decline. And, so you kind of basically take out your magnifying glass and go to detective work and say, which of these things is it?

Is it toxins? Is it amyloid? Is it growth factors? Is it B12 not being able to get into the brain? Is it that they have, you know, mitochondrial problems.

And and then you just kind of start investigating can even be the inability. I've had a patient where part of it was that she couldn't convert thyroid hormone into its active form in her brain, even though in her periphery she could is it high homocysteine?

So tons and tons of things. But let me do a couple of cases. I'll do one. Then we can talk and we can do another one. This is one of my favorite cases.

Now, I don't guarantee that everybody's going to get the kind of rapid improvement that this gentleman got. But he was a professor. I live in Austin and we have UT, and he came to us.

He actually was seen by my associate at my office saying that he knew his brain wasn't working as well, because he was now having trouble with math, and he had been a physics professor.

So, math was definitely a strong suit of his. And with him, he ended up being in a boy three, three. So again, we had to go, well, what's going on? And I'm going to kind of show you, a couple of the kinds of snips he had, but he had severe risk factors for vascular dementia, hidden mitochondrial issues that we never would have guessed because they're only like 3% of the population, nutrient issues and a bunch of other little things that we were able to tweak.

So he's 83 and again, he has a PhD in physics. And so, you know, this is not normal for him. Slums of 19. For those of you who haven't done the slums test and you're not quite sure what that is, it's a horrible name, but it stands for Saint Louis University Memory Screener, and it's a good memory test.

It's easy to do or have someone give to you, and normal is 27 to 30. Dementia is less than 21. And kind of in

between is that 22 to 26. He scored 19. So he's driving around living by himself.

But he actually meets the criteria for dementia. He has a history of cardiac disease a history of strokes high blood pressure. So that's already our first clue.

But he thought his mom had Alzheimer's and his maternal uncle had ALS. So the first thing we found when we looked at his genomics is he had this combination of a famous gene.

A lot of you guys have probably heard of me for some people call it mother father. Some people call it other things that we won't say, a podcast. But that one's pretty common.

But he had that along with this inflammatory pathway. And, Il6 is one of these. Again, anytime you hear interleukin, think of those inflammation, so it's one of these inflammation markers that can cross into the brain.

And when you have those two in combination and the particular snips of them, because there's like there's really like 40 of our snips and 20, you know, IL six snips.

But when you have certain ones of them that are known to cause brain problems, you have three times 3.7 times the risk of vascular dementia, which is just a fancy word for dementia because the brain's not going to get enough oxygen.

And he did have a little bit. He was kind of quiet, but you wouldn't have guessed after, you know, that he was demented. He also had something called Tom, 40, and Tom, 42 copies of it's only found in 2% of the population.

So what did we do to address this? Well, for far we gave him methyl folate for IL six. We gave him some natural things like sulforaphane, which is from three day old broccoli sprouts and curcumin that can kind of lower inflammation.

And then we kind of talked to him about what we could do for his mitochondria, because this was a really big deal. I usually find that if somebody has the thing, something that's only in like 2% of the population, 5%, that's known to be a big risk factor.

And Tom 40 can increase the risk. Like over fourfold. Then you've got to kind of address some of those things first. And so we addressed, his mitochondria.

And you can do alpha lipoic acid and acetyl l-carnitine. And CoQ10 and PKU and riboflavin and all these different things. And with him we basically gave combination things.

And I don't know what you like to do for it. What are your favorite mitochondria things I have. Nora Hacker has a product called Quality of Life that I think is very well, formulated for, for mitochondria.

Also, there's K-Pax and then and mito core I think is the other one. So there's a lot of great products on the market that are basically designed. They give you one, two, three, four pills and it's like a multi for your mitochondria.

Using genomics to guide lifestyle and supplement interventions

And I usually grab one of those as that's exactly. Yeah. That's the same things that I do. And then because he has such significant mitochondrial membrane membrane issues I also gave him mitochondrial membranes replacement.

And that work. If any of you guys want to read more about it. Doctor Garth Nicholson, who was at MD Anderson in Texas, looked at what you can do to kind of boost mitochondria that were damaged in patients who had had cancer chemotherapy and were tired because chemotherapy, antibiotics getting older.

It's hard to avoid that last one. They all damage that mitochondrial membrane. But then this guy had mitochondrial

membrane genomics that made it worse.

And it's basically a combination that he found that it's it's a great thing for a physicist because he found that you could take the old mitochondria and with fission and fusion, which already sounds like physics equations, you can combine the old ones and make new ones if you give enough of the extra membrane proteins.

So we also gave him some of the membrane lipids, which are and again, I don't use it for everyone. It depends on their on genomics. But anti lipid factor or ATP fuel are some of the ones that have that okay with this phosphor.

Total choline vestigial serine like your phosphate groups are more than just that. Yes. It's it's so it's basically about six different things, mostly phosphate title.

Assyrian choline and all the different fats. The total lipids that are found in the membranes. And they're like chewable and that, you know, because they're a little oily tasting, they're a little bit unusual when you chew them.

But they do come in capsules as well. But yeah. And it actually just helps. And it also has some, enzymes in to help protect against breakdown of them.

And so we did that and then we went and kind of dug into, I had gone out of order by a slide, but then we went into all the other things that we could address.

So we'll go back to that. And again, I'm not going to go through all of them, but one that is very common, particularly in Caucasians, is inability to make enough choline, which is needed to make phosphor type alkaline and you already picked up on it.

If you're not making phosphor title choline, that's going to make the mitochondrial things worse. But for those of you guys who remember, the Alzheimer's drugs are acetylcholinesterase inhibitors.

You need choline to make your memory neurotransmitter. So for the fact that he couldn't make enough, choline kind of just added fuel to the fire. So we gave him some choline, which is the best kind of coaling for crossing the blood brain barrier.

And there's again, for those of you who have visual as well as audio, you'll see there's tons of articles that show that said, a colon can help with preventing cognitive decline after strokes, and to make it so that you have, less, less severe strokes, better recovery, less dementia.

And so that was an obvious choice for him. And do you have dietary recommendations here? I know eggs have a good amount of cooling in them. Anything else that you recommend maybe increasing your intake of that you can get in the grocery store?

Yeah, that's a great question. So, and actually we have an Intel in Intel DNA. We have a functional medicine dietitian as part of our staff. And she made great handouts to go with everything.

So if you want to do it, like get your choline higher with food or your B6 higher with food, or all those. But choline, eggs are a great source. You have to eat the yolk because it's in the yolk.

Salmon is a good source of choline. Beans are a good source of calling organ meats. I'm not a huge fan of organ meats. Because if the cow has not been, if the car has not been grazing on organic, you know, grass fed, that liver is going to have a lot of toxins.

But so be careful as to what kind of liver you eat if you're going to eat liver. But yeah, there's tons of foods that you can use as well. It kind of depends.

So there's about six different snips in the choline synthesis pathway. If you're really bad at making calling, you might need as much as 1000mg a day.

If you're a, you know, postmenopausal woman or a man, then it's going to be hard to get it from diet. But if you only need a little bit extra, yes, of course you can do diet.

It's really fascinating. I was reading a research article recently that was talking about, the neurodevelopment of children and how their mood, they tend to have less A. D. D., less ADHD, less anxiety, depression if mom gets enough choline while she's pregnant.

So when they're in utero and it's wild because we're talking about the entire other end of the spectrum in terms of the life. But it's the same. It's the same things coming up, not only a neurodevelopment, but also a neurodegeneration that that help and support good quality cognitive function.

And of course, mood tends to come with this. Yeah, that is a great point. So we used genomics for this gentleman's cognition. But we have genomics that are geared at ADHD and OCD and anxiety.

And we use different core panels of course because there's different genes that contribute to ADHD then contribute to cognitive decline. But it has the same detox panels, the same B6 panels, and magnesium panels and choline and copper and zinc.

Because you're absolutely right. These and we also have, an autism some autism work going on. And we just published a study with that. And we also get some great results there.

And again, we use a lot of these same core nutrient panels mean the same things that we in the functional medicine world, in the natural world use natural paths have been using nutrition, you know, understanding what the brain needs for since the beginning of time.

And so I think you're absolutely right. It's important not just at the end of life, but if we do it in the beginning of life, we can decrease so much of what is causing children to not really thrive.

In our current, you know, environment where food is not necessarily giving us adequate nutrition. So I won't go into details about all the other things that that David had other than just to give you an F of little ideas.

So he had something that normally will stop inflammation that was not working well. So he couldn't stop inflammation in the arteries. It's been associated with cardiac arrest called aisle 37.

He had something that made it so your lining of your arteries built up kind of more plaque, more foam cells. He had things that make it so that you get more calcification.

And all of these have different interventions and some of them are super easy, like vitamin K2 can help block that calcification of the arteries and help it so that you get the calcium going to the bones, not to your arteries.

He also have need for higher B-6, and then more, tendency towards getting higher CRP, which again is a different kind of inflammation and problems with magnesium.

So we just kind of addressed all of these. And he also had that BD and F that we talked about where you've got to really exercise. He had things that relate to glue to iron and detox.

And so you know we think of detox that sounds kind of like a new age word. But if you even eat a plant, you're eating some vegetable from the garden or basil.

There might be things in the plants historically that your body doesn't find beneficial, and you have to be able to spin them out. Well, those same detox pathways are really needed to get rid of pesticides, to get rid of insecticides.

You know, glyphosate, which are herbicides used on a lot of our crops. And so he was not good at some of those pathways. So we also addressed those. And so how did he do?

And what did we do? So again, we gave him mitochondrial support. We gave him a set of choline. We did actually give him a statin. And some people might go on statins bad for cognition.

Remember this guy's cognition was due to plaque building up in his arteries. He had a very high LDL. And so getting that plaque stabilized, there is good evidence for now.

There are supplements that can do that as well. So if somebody doesn't want to use medicines, there are other ways. But he actually chose to use a medicine.

Case study: reversing cognitive decline with targeted support

Once we talked to him about that, we gave him that methyl folate to solve for pain. All kinds of different things we address, you know, got his thyroid optimized, his diet optimized.

And the exciting part oops, I didn't tell you the conclusion. And the exciting part was we normally retest advanced cognitive testing. Six months later.

And at four months, he walked into my associates office and he said, I want to redo the cognition test today. And she's like, well, you know, it's only been four months because I can tell it's better.

And he was so compliant, which is unusual for an 80 year old guy living alone. But he just was. So his brain was so important to him. You went from 19 to 26.

So from dementia to the border between mild cognitive impairment and normal in four months. And that is easier in threes in general than they would force if we forced tend to take a little longer.

So if you are an 84, don't expect that you're going to kind of reverse any cognitive issues in in four months. But it's always good to hear. And we do have great success stories with a boy force as well.

It just depends on the patient. You know, if they do all the things they're supposed to do and how their body responds. But it was very exciting. I think what we see in our practice as well, and at it, at the residential care facility, we see that people are typically getting better within about six months.

There should be improvement, and if there's not, then we kind of wonder, what are we missing? And certainly the ability for we give it a little bit more time.

But it's so validating to hear that you're having similar experiences in Texas. And so it's what we're seeing. It just adds to the data and the hope that I hope people walk away with today that, yes, there are things that you can do, and there are doctors getting really good results, not just in my clinic, but in yours and many others around the country.

So there, if your neurologist is and here's some namenda and get your affairs in order there, go see another doctor because they still want to. There's something that you can do.

And that's partially so I had been I love teaching, I had initially gone to Harvard to do a PhD in medicine, and I switched to doing my medical degree.

Not that I, you know, I love practicing, but I love teaching. I mean, I stopped counting, like when I gave my 400 talk, and I realized that if I could put some of the ways, since I like to teach, if I can kind of put some of what we do in our clinic, that's been successful because we were part of the original Recode 100 study with Doctor Bredesen.

So if I can kind of help make it easier for other doctors to kind of identify those holes and do a recode protocol and give them that support, then it just helps kind of spread the word.

And so you will find people. We have people in every state that have chosen to do additional training in genomics,

and there's people in every state that have chosen to do the Apollo recode, and that can help with kind of these kinds of protocols.

So absolutely. I think that people should find a doctor and generally it's, a clinician that's either, again, a naturopath or an MD or a D. O. that is done integrative or functional medicine training.

That has a different approach. But absolutely. You want to do one more case. Yes. The other thing, I think that was really important that you mentioned there was just how, kind of enthusiastic he was about the implementation, that we see that as well, that the more someone can implement, the more confidence I have that they're going to improve and improve faster, that if they're not really on it with the diet and they're not really changing their exercise and they're taking some of the supplements or some of the medication that then, it's much harder to get change, especially in six months.

Yes. No. And actually, there is a case that Doctor Bredesen and I did for a town hall for his, for the Apollo kind of recode patients and also for the clinicians.

And she was in about A44. And she also started around, I think, 19 or 2021, I can't remember exactly where she started. She got to 30 and wanted to keep going because we got some more genomics back, and she wanted to keep going.

It took her 17 months to get to 30, but still, I think how tremendous that is. She's an able a 44 with 65 years old starting to have, you know, dementia and got back to normal.

And that kind of leads in to this, this next case because part of why she was having her problems so early is she had a heavy toxin load. And so things like mold, things like environmental toxins, they can really add insult to injury to the brain.

Yeah. And we'll go into this case. But for anybody who's looking for even more information, we are going to have lots of information about toxins. So Doctor Neil Nathans talk, doctor Joe Christa's talked after Margaret.

Margaret Christiansen. They're all joining us and head over there. Look at those talks. They're incredible. And, they'll give you more details about how you might approach more toxicity.

It might be something you're coming into contact with. So please, like, I can't wait for you to share this case. I'm like, on the edge of my seat. Let's dive into it. Yeah.

And this is not a mold case. I've done lots of mold cases. And had anybody told me 30 years ago when I was in medical school that I would be treating a moldy brain, I would be like, you've got to be kidding.

I'm very evidence base. I'm very scientific, you know? But, you know, the reason that people sometimes don't acknowledge things is, again, genomics helps to give validation because some people have great detox pathways.

They can be in a room with mold and they don't feel anything. But for people who can't, they get significant symptoms. And so I think that's the other real advantage to genomics is you go, wait, this makes sense why I got more joint swelling when I got Lyme disease or why I got more brain fog or, you know, it's we all are a little bit different, but this case, was one of my colleagues, he is a physician, and, his wife brought him in, with him because, you know, sometimes guys aren't the first people to notice, nothing to you. Those of you are guys.

But sometimes guys are a little slower to notice something wrong. And, he had severe toxin induced changes to his brain and didn't even know that he had had exposure.

So let's talk about what happened with him. So we're calling him Philip. Of course, all names and identities have been changed, and he is a surgeon, so he spends a lot of time in the O. R., but on weekends, he goes to his ranch to relax and kind of get away from things.

And his wife and his daughter were starting to notice cognitive decline. He got kind of lost in the grocery store, not normal for a 54 year old surgeon and didn't know where his cart was.

And they thought maybe the cart was with the wife and didn't know where she was. Mom and dad both had some sort of dementia. He thought it was a frontal temporal dementia because they really became very, very quiet kind of lack of speech.

But it was never really figured out. When we looked at his cognition. Genomics, it was almost perfect. I would have loved to change panels with him. I mean, I I've never seen such a, you know, a great panel.

And we all have things in our family histories. And I'm like, wow, that's great. But then because he even had some benefits and that's another point. There's not only bad genomics, there's good genomics.

And I think it's important. That's why we also made, Intel DNA. Because you really do need a clinician, somebody who understands this to kind of guide you through it.

Because if you only know that you have one bad thing and you don't know the whole picture, you don't know what the good things are. It's just not enough information.

But he had some benefits. So I was like, I really don't think this is Alzheimer's. When you have, you know, none of the most well known, you know, genomic risk factors and you've got some benefits.

But he's not able to focus still during conversations. He's emotionally flat. So then what's going on? Well, we talked to him about what does he do on his ranch on the weekends and could he possibly we get his genomics back.

And this is what made me start to have that discussion. I said, let's get some genomics and look for some clues. And I get his genomics back and his, before we could look at this genomics, he had significant abnormality for his California verbal learning.

He was in the 37th percentile and then it's kind of normally every time you do it, you're going to learn a little bit more. And that's how you stay in the same percentile. But he couldn't remember.

And he by so that by trial five he was down to the ninth percentile. So that's significantly abnormal. So then I get his his genomics back. And this is this is not an actual screenshot from Intel DNA because it would be way too long.

We would only see like one snip at a time and all this information. But basically he had two of the five parts that are the main detox part of your glutathione pathway.

There's like glutathione transferase is and then they have different letters like M and T and P three of the five goldfine transferase is the most important ones.

We're all really bad. Two of them were completely missing. That's called a null. And again, you can't usually get it that through some of the direct to consumer products.

So he has a complete null there. And then he has the most important one associated with pesticides and glyphosate, where he has two copies of that, which is also been shown to give 1.87 times the risk of Alzheimer's.

So I ask him, I say, so do you ever, exposure to pesticides? And it's like, I don't know, not really. I'm not sure. And then he, and then he goes, except for me at my ranch.

And I'm like, well, how often do you go to the ranch? Well, only on the weekends. Well, what do you do there? Well, I like to get rid of the weeds myself.

I don't like to have gardeners, so I have, like, I spray roundup and different things, and, I'm like, do you wear a mask? No. And so this was a huge, huge deal.

And again, you can look at the literature and you can see that glyphosate and pesticides all cause damage. And Gina toxicity and brain inflammation and all kinds of problems.

We checked the toxins in his urine, and the urine toxins were off the chart. I mean, they they were beyond, you know, they couldn't say that it was the 95th percentile because literally they were off the charts and for a number of toxins.

And so, what we ended up doing is again, talking to him. He was not an integrative person, but he wanted to get well, about getting well quickly. And we ended up giving him because he was in and or had access to IV nurses.

He ended up we ordered him in the clinic. I need to have the nurses give it to him at work. So he could do it regularly. And that made a huge difference.

We also also gave him sulforaphane. Like AV, McCall was used in some of the studies for autism and schizophrenia. So I use that one because we know it crosses the blood brain barrier.

But it's from three day old broccoli sprouts and and then NAC, which helps you make your own detox, promote your own detox pathways. And that made a huge difference.

He got about 80% better just with doing that. And so you really have to think about environmentally acquired illness. Now, the funny thing is, I said he only got 80% better.

It turns out when he was kind of only 80% better, I kind of went back through this checklist. Can how could we have mercury exposure? Like, have we check for that.

And I hadn't and him checked for moles because I had asked him, you know any mold exposure. And I said are you sure. No mold exposure, no water damage.

He goes, no, we got rid of that. We had a completely moldy house in moldy basement and we had it remediated. Well, actually, you know, if you have your house remediated, it's still at risk for recurrent mold.

You have to be very careful. And it turns out his basement was also starting to get some mold again. So, if you haven't got an oil environment and you know, you're good, a thousand pathways don't work very well.

Well, you might not be exposed anymore, but that the mycotoxins could have accumulated.

Toxin exposure, mold, and detox pathways

And if you didn't get rid of them, then, it could take a little bit longer and maybe take some more precision around how to get them out. Yes. And obviously, you know, I've kind of gave you the, the brief version, but, we really didn't do that many things in him because he wasn't willing to do that many things.

I gave him ideas of other things. But we I kind of used the once a week vitamin D because he didn't want to take anything every day. It was just kind of he just wasn't used to that.

But all of these things, the thing is, there's this whole pathway, and I'm sure that some of the other speakers that you're going to have, we'll talk about it.

But it's called the nerve to keep pathway and mold turns off mitochondria. Mold turns on inflammation. Mold turns off the anti-inflammatory pathways, and all of those lead to neurodegeneration.

So now it's been about a year. And, he's doing great. I mean, he was actually thinking about taking early retirement and all of that because he was pretty scared.

But he is doing extremely well. And in fact, he started, like I said, to get better, after only a few weeks of entry of

treatment, it was pretty important for his wife as well, because, his behavior was so, so abnormal that she really was like, what am I supposed to do?

My, it's not my husband anymore. And she didn't know what the cause was, so that was helpful. So, that is, you know, the main thing that that I think that I want to kind of convey is genomics is really useful, but make sure you find someone that can help you use it.

Well, because, to just know that you have snips will create fear, but to know how to address them, that's using genomics as part of clinical decision support.

That's using it in a positive way, just like you would use any lab test. And by addressing the snips, then it becomes really beneficial. How wonderful.

Thank you so much for sharing this. It's just such important and essential information for anyone who's struggling and really for all doctors who see someone struggling, they should know that this tool is out there, that this can give us that extra information so we can be making even better decisions to help our patients.

So, doctor, thank you so, so, so much for doing this. I have one last question. Should I do this and when? When should someone consider getting their genomics done?

Is there doctor Bateson talks about a colonoscopy, usually around 40. What you've talked about working with children and you know, kids struggling with autism or ADHD.

So is when kind of the ideal timing is you wait for something to be off or should everybody have this done immediately? Are they going to sell my information if I have it done?

Like how? Tell us who should get this done and when and which should they maybe worry about or not? Great questions. So absolutely we do not sell information.

It's done anonymously under a barcode. In terms of who should have it done. So Doctor Perlmutter and I did a, webinar together during Covid, but we did talk about cognition as well.

And, kind of stayed on, talked, and I asked him and was and he actually share some of his own genomics and different things. And I was like, you know, we're talking about using this in our cognition patients.

And he's like, everybody should be using it when they want to optimize their cognition. You shouldn't wait till someone has Alzheimer's. And of course, he's kind of the founder of integrative neurology.

And I agree with that, because most people will start to notice slight differences. They're having to do workarounds with their words or a little bit of word finding, or they go to the kitchen and go, what did I mean, to get in their 40s.

And if you can catch it earlier. So if we catch someone while they're having very mild cognitive impairment or are still in the normal, but they're just noticing it because they're very educated and want to be proactive, that is easier to reverse because you don't have the neurodegeneration.

We have had benefit for people who have severe, you know, scores in the the two and the eight, but it's less likely that you're going to get significant benefit.

But we sometimes it'll be the difference between someone being almost nonverbal and, you know, belligerent and being able to at least dance with his wife when music is on and being able to say that they hurt but not and maybe being able to keep him out of assisted living, because they're easier to manage.

But if you can catch someone early, you can get them back so that they can be traveling, enjoying the grandkids, you know, going to the grocery store and just living a full life.

So I do think that, one of the missions of myself and my, co-founder, Carol village, is that we this eventually become something that is a clinical decision support tool, just like we ordered labs on people to check the thyroid and their vitamin levels that we do this early on.

But don't do it until you're ready to do something about it, because, when any lab tests were taught in medical school, don't order it unless you're going to do something about it.

So I don't tend to do it on a lot of high school and college kids because sometimes it takes a little more maturity. You know, if they're elementary school and they're having ADHD or having problems, there's mom and dad to kind of help them.

But when they're in that high school college age, unless they're interested, don't do it. So, I find that by the time people are getting to late 30s, they're 40s, they see their parents, their grandparents having problems.

They're like, yeah, tell me what to do. I want to be proactive. So as soon as someone's ready to be proactive or if they're young and have support, I think it can be tremendously beneficial.

In our autism study, the pilot was done at the Australian Center for Genomic Analysis, with, doctor Heather way, who's really a, amazing neutral genomics PhD, that has worked with autism her whole life.

She had kids that they got from only 3 or 4 words, wedding their beds every day to, not wedding at all anymore. Back to being able to communicate with their teachers, being mainstreamed in schools, getting their driver's license, going to prom.

When to test genomics and who should consider it

And so if you're having a child that's having neurodevelopmental differences, no one's going to promise you that they're going to get those kind of dramatic effects, but it can help your doctor get improvement.

So that's incredible how helpful. Thank you so much for sharing the hope and the information and and really breaking down the nuts and bolts of something that can feel a little bit intimidating sometimes.

I think both to providers and certainly to patients, who are struggling. So, so much for sharing this tool, for creating this tool, and for just being a delight to work with.

Oh well, thank you so much for having me. And for all the wonderful work that you're doing in California with showing that even if somebody does have to go into an assisted living, it doesn't have to be a downward decline that we can continue to help and do the improvement in those environments.

It's really amazing work. Thank you for your support. It's it's also a lot of fun, very rewarding. Thanks so much. For.