#61: Dr. Jill interviews Dr. Sharon Hausman-Cohen on Mood, Memory and Mental Health

Dr. Jill 00:12
Hey everybody! Good afternoon. We're back and today I'm with Dr. Sharon Cohen and I'm really, really excited about our topic of mood, memory, and cognition. We're going to dive deep into some new genetic testing and some stuff that's really changed not only my life but the lives of my patients.

Dr. Jill 00:30
I know a lot of you out there who are listening are either practitioners who are dealing with complex, difficult cases or your patients are in the midst of a health struggle. And if it's not you, it's probably someone you love. What I found in my experience over the years is that I remember 15 years ago doing functional medicine and having someone with thyroiditis, menopausal symptoms, or maybe fatigue or headaches come in, and it always seemed like getting to the root cause was fairly straightforward. We'd fix the gut, we'd treat the hormones and within three to six months, the patients would be feeling great. And what I've seen now is that the complexity of the illness and the types of patients that are seeing me at least—and I think this is really common to my colleagues if you're listening, or if you're a patient, you're nodding your head too—is so much greater. And I would say it is rare, if ever, that I have a case where there's one problem, one solution, or that it's simple.

Dr. Jill 01:22
If I talk about the background there, I think some of it is that our environmental toxic load is continually increasing. Our stress levels are increasing. Our electromagnetic radiation is increasing. So there are a lot of strains and stresses on our immune system and on our body. It's almost like the straw that broke the camel's back and we're reaching this equilibrium here, where we're reaching the speed at which our immune system can't keep up anymore. And it's sad. And of course, as I bring people to interviews and we talk about topics, what I always want to bring is just great information to help you, whether it's, "What are histamines? What are EMFs?" and how to deal with this stuff. The more information you have,

the more empowered you are to either, as a clinician, help your patients or, as a patient, ask questions that get to the root cause. So that's just a little background here.

Dr. Jill 02:08
I want to introduce Dr. Cohen today. And I'm just so excited to have her here. I know you're going to love the information she has. If you want to find us, you can find me on my website, JillCarnahan.com. You can also find this video and all of my 60+ other videos on my YouTube channel. If you just go to 'Jill Carnahan' on YouTube, search and you'll find all the videos there. You can rewatch these. And this one, of course, will be replayed as well.

Dr. Jill 02:35
So without further ado, I'm going to introduce Dr. Sharon and then we will jump right in. She's a chief medical officer and co-founder of IntellxxDNA and Resilient Health Austin. We're going to be talking about some of this genetic testing that she's developed. I'm so excited for that. She received both her master's and medical degrees from Harvard Medical School. She's a fellow of the American Academy of Family Medicine and a diplomat of the American Board of Integrative Medicine. Dr. Hausman-Cohen has been in the field of integrative medicine for over 25 years. She and her co-founder developed IntellxxDNA as an answer to an unmet need in the integrative and functional medicine community: The need for an accurate evidence-based genomics tool geared to helping functional and integrated physicians practice personalized medicine.

Dr. Jill 03:20
And again, as you heard in my intro, this is why I'm so excited because I'll tell you in a few minutes some of the changes that helped in my own health and in the health of some of my most complex patients. They envisioned and created a tool that could help identify the root causes of cognitive decline, environmental-acquired illness, and other chronic illnesses and one that could also help clinicians know how to address these genomic factors. That's another thing—again, you're going to see this—but what I love about her tool and the testing that she's helped develop is that there are really practical interventions. [With] so many of these [types of] things, my patients bring in this 200-page report and they're like, "I don't know what to do with this," and the doctor doesn't know either. So the great thing about this is that I

feel like we've got lots of practical tips and tools on how to actually use the data. Data isn't the problem; we have thousands of pages and ways to get data. How do we use that data?

Dr. Jill 04:12
She loves to combine her passion for science and medicine, using her scientific mind to integrate large amounts of complex data. I love this, Dr. Sharon. The same as me. She's taught extensively around the country at conferences for physicians as well as for community members and she will be featured in a documentary being released this year on the "Future of Health Care". She's published many, many papers and worked alongside co-authors such as Dr. Dale Bredesen on the landmark paper "Reversal of cognitive decline". So thank you so much, Sharon, for being here. I am absolutely delighted.

Dr. Sharon Hausman-Cohen 04:47
Thank you so much for having me.

Dr. Jill 04:49
You're welcome. I would love to hear first—we talked just a little about your background and that, but there's always a little bit of a personal journey—how did you get into creating this company? And tell us a little about your journey to get here.

Dr. Sharon Hausman-Cohen 05:02
Well, as I said, I left academia. I thought I was going to do a Ph.D. in medicine but it didn't really take me very long to figure out that I was not a one pathway type of girl. I didn't want to spend my whole life on one pathway of the brain or one hormone. So I did a complete switch. I went to medical school and became a family physician because I was interested in so many different things and said I'd always get back to research when I found the right project.
Dr. Sharon Hausman-Cohen 05:29
I had a strong background in genetics before I had gone to medical school. Then the 23andMe revolution happened. Patients started bringing me their genomics and going: "Can you help me prevent cognitive decline?" "Can you help me prevent heart disease?" "What does this all mean?" I realized there was not a tool that was developed for clinicians, especially those of us in functional and integrative

medicine, that was accurate or useful at being able to take that genomic information and translate it into: What is the root cause or what are the many root causes of what's going on for the patient? And how can I help them?

Dr. Sharon Hausman-Cohen 06:08
So at that time, I had just left a bigger practice and founded Resilient Health with my co-founder, Carol Bilich. She came up with the idea of saying, "Let's reach out and see if we can get a custom report developed for our needs as a functional medicine office." That ended up evolving into us just creating IntellxxDNA and then offering it to clinicians across the country. Obviously, when we realized it would take tens of thousands of hours and lots and lots of research, staff, money, and all those things to develop, [we also realized] that it needed to be something more than just for our office. So now we're really proud that it's being used by clinicians like you across the country and like Dr. Bredesen in his studies. We've had so much success with helping people, whether it be with an environmentally acquired illness or cognitive decline or just trying to understand their osteoporosis, heart disease, or diabetes and improve it without all the solutions being medication.

Dr. Jill 07:10
Yes. And I'll just tell you a little bit of my personal experience as a clinician and even my own testing because I've done this myself. Sharon, it was so interesting because I've had these patients where you do everything that should work and they're just stuck and they're not getting well. And a lot of the patients I deal with have mold-related environmental toxicity. They have Lyme disease and co-infections—so lots and lots of toxicity issues and infectious burden. They're just stuck. And I remember the very first one we tested. She had weight gain and edema. [She] really, really [had] difficulty with any sort of antibiotic or herbal regimens for the Lyme and tick-borne infections and was really gaining weight excessively and had no ability to lose that weight.

Dr. Jill 07:53
Well, she had, because of some pancreatitis related to one of the infections, gone on a very low-fat, high-carb diet. And it was still complex carbs; it wasn't like she was eating junk food. But that worked better at the time for her pancreas but she gained all this weight. You might know the name of the gene; I just know the functions because I remember what we did to intervene. But there was a specific

gene around carbohydrate metabolism and sugar intolerance, as they call it. It's not a technical term but you guys listening will know what I mean. And literally, we're like, "You have to go off all the carbs, especially anything remotely sugar-related or refined." She lost 40 pounds in a month or two. It was a very, very quick weight loss. I don't know if you remember that at all or even the gene.

Dr. Sharon Hausman-Cohen 08:29
I think she had problems with her adiponectin pathway. So when she was eating the wrong foods, she just couldn't metabolize starches well at all because of her genomics.

Dr. Jill 08:40
Yes. And then inflammation too, right? That, particularly for her, was very, very inflammatory. It is for all of us, but for her, it was like on fire. I don't remember the other details but what I do remember is that we talked about genetic interventions. You and I actually went over that test. It was my first one. And then I put into place a lot of the steps that we talked about and within three months, we really saw a turnaround. So that was when I became a believer. And again, I loved what your work was but it's a lot of information. So for me to implement it, it took that case. And now I have three or four cases and every one of them has been game-changing—really, truly game-changing. Another patient was almost bedbound with muscle weakness and he had an inability for his muscles to use carnitine to get into the muscles. Remember that?

Dr. Sharon Hausman-Cohen 09:28
That case I remember really well, yes.

Dr. Jill 09:30
Right. And then [there was] also the inability to convert T4 to T3. What's so strange is that he had all the symptoms of hypothyroid. He had clinical evidence of a low-ish T4 and normal TSH, and when we gave him T4, he just crashed. He did terribly. So no wonder, right? He's someone we just made some interventions on and haven't seen the change yet, but I expect we're going to also see a turnaround there. Totally game-changing. I have one more that I'm going to review soon, so we'll report back on that.

Dr. Jill 10:00
And then myself. Oh gosh, I had breast cancer at 25 and Crohn's at 26. I grew up on a farm with lots of toxic chemicals. And one of the most fascinating things to me—I had to write it down because I don't know the names of the genes—NQO1. It was only 7%—a really rare gene. And again, you can clarify this for me, but it was related to solvent and benzene—inability to process. Do you want to say a little bit more about the gene?

Dr. Sharon Hausman-Cohen 10:26
I think that's a really good point, Jill. As physicians, we can't memorize hundreds of genes. There are 25,000 different genes in the genome, and it would just take up useless parts of the brain to memorize them. And that's exactly why we built the tool, because even for the most experienced and proficient functional medicine doctors, that's not what they want to spend their time on. So what we did was build this tool that explains the gene and gene function. But that gene, NQO1, which is an NADPH quinone reductase, is basically a recycler of your antioxidants.

Dr. Sharon Hausman-Cohen 11:02
So there is a famous NQO1 SNP that is one of the dirty genes. That one's pretty common. That one is in 30% of the population. But this one is even more serious; it's only in 7% of the population... And NQO1 is needed to keep CoQ10 in its active form to recycle vitamin E to its active form. We know that those antioxidants are so important for getting rid of toxins and toxicants, which can contribute to the risk of a lot of different things, including cancer.

Dr. Jill 11:33
Wow. It made so much sense to me. Later, I recently interviewed my only living grandmother, as I'm writing my book to get a history. One of the most fascinating things I learned about her history... And then I wrote an article about benzene toxicity based on this and I didn't even know that I had this genetic [predisposition]. But what I found out [about] her and her siblings [was that] their father moved into town and bought a car dealership when she was about 14 or 15. They moved [and lived] over the auto dealership. Their apartment was right over an auto shop with diesel fuels. And back in the day, they didn't ventilate well. Those fumes and solvents from benzene and probably lead came right up into the apartment.

Dr. Jill 12:13
My grandmother's mother, my great-grandmother, would get so sick with migraines. And she was back in the day. Now we have all these people [who are like]: "I'm gluten sensitive." "I'm dairy sensitive." "I can't eat peanuts." "If I go in the aisles of the grocery store, I get sensitive." This multiple chemical sensitivity is a sign of toxic overload. And it's super common, right? Now we see it all the time. Back in the 1940s or even the 1930s, it was not common, and my great-grandmother had that. She would drink the wrong water and react. I look back and I'm like, "Oh, this pattern."

Dr. Jill 12:44
Well, here's the interesting thing: They all lived in there. My grandmother got married very early. She left after [something] like two years of living in that apartment, so she wasn't there very long. She had the least exposure and she's doing pretty well. But her father died of liver cancer, her mother died of liver failure, and her siblings died of metastatic cancer to the liver. There was this pattern. And when I saw that, I was like, "Wow, this is so profound because my genes come from my ancestry." I bet there were some benzene issues with them related to this NQO1 gene as well. Doesn't that make sense? And it's so interesting that there's a specific exposure to likely benzene in my family.

Dr. Sharon Hausman-Cohen 13:20
Yes, absolutely. And it's not just benzene; it's many of the inhaled aromatic hydrocarbons and all of the different toxicants. It's really interesting that you talked about migraines. Well, what is one of the natural treatments for migraines? CoQ10. With this, you don't make enough CoQ10, and you can't keep it in its active form. The thing is, you talked about liver cancer, breast cancer, and all these cancers. Well, one of the things that upregulates NQO1—because if you have one gene that's really not working at all, then you can push the other one a little bit more—is sulforaphane. There were studies done at Johns Hopkins showing that sulforaphane had breast cancer benefits. And then they've used that same formulation to show that it has liver cancer benefits in China. So it really all comes together. It's really exciting.

Dr. Jill 14:12

And you mentioned NADPH. When I first got mold toxic back in 2015, I remember being very intolerant to glutathione. Later, I realized that glutathione reduction-oxidation involves NADPH. I was probably so depleted of NADPH at that point that I couldn't tolerate any glutathione. I think it got all reduced or it was just completely gone. It was actually several years into it that I started doing NAD as a precursor and nicotinamide, riboside, or several precursors. It was a game-changer for me. I bet that my entire life prior to that I had been really, really deficient in that nutrient for NADPH recycling.

Dr. Sharon Hausman-Cohen 14:49
And NAD also pushes that NQO1. So those are both things that really help you: Sulforaphane, [inaudible], and NAD. It makes sense. And that's the whole point of why we would do genomics because, as a functional medicine physician, you could do trial and error and go: "This makes me feel good; this doesn't." But isn't it great when someone can come to you and you have this kind of book of them that you can use as a beginning guide to help make those decisions? And that's what IntellxxDNA does.

Dr. Jill 15:16
Sharon, it's amazing. And I only talk about stuff I totally love and believe in, which is why you're here. I was like, "Wow!" because we know in our heads, "Oh, maybe DIM, maybe calcium D-glucarate, and maybe sulforaphane will be helpful for breast cancer." But for me, the sulforaphane has extra power because of my genetics, so I can very much fine-tune. The same [is true] with the patients. Who would have known this person had T4 to T3 conversion issues or this person had intolerance to glucose, or whatever we're seeing? So I've been super excited. I'd love for you to share a little bit with us. I think you have some cases, so we can jump into that.

Dr. Sharon Hausman-Cohen 15:50
Sure. We were talking about the fact that this has been a crazy year, and anxiety has been a big issue. So I think that a good case to do would be an anxiety case. I think that before I do the anxiety case, what I would love to do if it's okay with you, is just bring everyone up to date on what a SNP is.

Dr. Jill 16:13
Perfect.

Dr. Sharon Hausman-Cohen 16:14
So, if you make it so they can share my screen... Or do I need to do that?

Dr. Jill 16:20
I think you can share. And if you just hit "Share Screen"... And if that doesn't work, I just hit "Multiple". Try that. If it doesn't [work], I'll go to "Share".

Dr. Sharon Hausman-Cohen 16:30
Sorry, one second.

Dr. Jill 16:31
Sure, no worries.

Dr. Sharon Hausman-Cohen 16:32
I'm not seeing...

Dr. Jill 16:34
At the very bottom, under "Share Screen".

Dr. Sharon Hausman-Cohen 16:37
It went to a black screen. Hmm. Let me see if we can.

Dr. Jill 16:48
The other option [is that] if you send me your slides, I can share them for you. But I think it should be much easier if you could share for the sake of [inaudible].

Dr. Sharon Hausman-Cohen 16:56
I think I'm going to do... I'm just trying to get it back to the...

Dr. Jill 17:08
In the meantime, let's see, I'm thinking of a few other things that... Oh, B12 for me. So, I have all of the problems with B12, whether it's MTRR—again, you know some of the names better than I do—basically getting it into the cells and absorbing it or hypochlorhydria. I had pernicious anemia. I always knew that I did well in B12, but when we started talking about the genetics from my test, it was really an aha for

me. Not only do I do well with B12, [but] I [also] need high doses. And that was one of the other things that really was profound for me because I've always done a very high dose. I knew I needed it, and I never got toxic, of course. It was one of those profound ahas when I realized the reason behind that need for B12. And as you mentioned when we went over the genetics, B12 deficiency can relate to cancer as well. So who knew if that would have played into [it]? Not only did I have a gut that wasn't absorbing it, but I had genetics that weren't getting into the cells, so that was a pretty big and interesting find when I realized about the B12 as well.

Dr. Sharon Hausman-Cohen 18:10
So what I'm going to do, Jill, is share this with you. I'm going to start to talk about genomics while it is being sent to you. I'm sorry about that. I think that the thing is, everybody kind of uses that term genomics, and people are like, "Well, what does it mean?" When we think of genomics, we know what the gene is. But genomics is a little different than a genetic illness. Genetic illnesses are things like Tay-Sachs and trisomy 21. They tend to be pretty big genetic events, often caused by one gene or a piece of a gene—that's what I would call a macroscopic event—whereas genomics is looking at those single-letter changes in DNA.

Dr. Sharon Hausman-Cohen 18:55
Our DNA is made up of four different letters: A, T, C, and G. When you change one letter—you change an A to a G or a C to a T—that tiny little change doesn't usually have a profound effect. In fact, sometimes it has no effect at all. But what can happen is that sometimes it can completely change the recipe. So there are kind of on-off switches in genes, and if that is in what's called the promoter, then it's going to make that gene be much more of something. If that same effect is something that changes it to stop, it's going to make you have less transcription or less of making that protein.

Dr. Sharon Hausman-Cohen 19:39
I kind of think about our genomics as recipes. If you think about it, we have recipes for all these different enzymes and proteins. It's kind of like having a recipe for cooking. If you change one word of a recipe from "blend" to "stir," no big deal. But if you change a recipe from "bake" to "broil," that's a big deal. And that's really what we see with genomics. So when you get this case, I'm going to tell you a little bit about the case—

Dr. Jill 20:07
And, Sharon, did you email those?

Dr. Sharon Hausman-Cohen 20:10
I did. I don't know if you got it yet.

Dr. Jill 20:17
I did not but I'll keep watching here. Oh, there we go. Oh, not yet. I'll keep watching. You can start if you want.

Dr. Sharon Hausman-Cohen 20:22
Okay. Well, I'm wondering... So let me start with a case, and when you get it, it's slide 21. It's the case of anxiety. I sent it to your Dr. Carnahan email.

Dr. Jill 20:47
Perfect. Got it. Okay.

Dr. Sharon Hausman-Cohen 20:52
This is the case of a woman who is a nurse. She has intermittent anxiety and she's going through menopause right now. She has been an oncology nurse for 30 years. We're going to call her Grace. For any of the cases we're using, of course, we've changed the names. Grace has symptoms of anxiety that come and go, but she particularly notices that when she's stressed. She is a person who spends a lot of time with high attention to detail. She's very hardworking and has a family history of some anxiety and OCD-type symptoms in her daughter. She comes to me saying, "What can we do about this?" And I won't know when you're sharing your screen since my computer is doing something funny, but just let me know.

Dr. Jill 21:43
Okay. Yes. It's one of those. It must be the moon or something.

Dr. Sharon Hausman-Cohen 21:48
All right. I'll make sure it got sent. Otherwise, we'll just do it with—

Dr. Jill 21:53

You got it. Obviously, we can just talk through it because it's fascinating the way it is.

Dr. Sharon Hausman-Cohen 21:58
Yes. And I'm going to forward it to your other emails as well, Jill.

Dr. Jill 22:00
Okay, perfect. You got it.

Dr. Sharon Hausman-Cohen 22:02
One of them will have it. Okay. Sorry about that. So I just forwarded it to a couple of other of your emails. So anyway, she has a lot of genes. When we look at genomics, we look at hundreds of genes. But we have a particular panel that we call our "Mental Wellness" [panel]. We particularly did not want to call it "Mental Health" because, for somebody who's dealing with stress or some mild depression symptoms or even chronic depression or OCD, labeling that as a disease as opposed to trying to support them in better understanding themselves doesn't make sense. So we looked at her genomics. And the reason I want to share her case is, classically, what do we do for anxiety and depression?

Dr. Jill 22:54
Benzodiazepines, theanine, drugs or even herbals. But we just give them something for it, right?

Dr. Sharon Hausman-Cohen 23:01
Right. The most classic prescription medicines are the serotonin medicines—Prozac, Paxil, and Zoloft—to raise serotonin. Well, none of the genes that were in Grace's genomics were related to serotonin. So the first one I want to talk about that she had—

Dr. Jill 23:16
And I got it and we're up.

Dr. Sharon Hausman-Cohen 23:19

Okay. I can see it now. So if you go to slide 22, we can start there if you want to put up the view. But we can do it just like this if you don't want the whole screen. Whatever way you want it, it's great.

Dr. Jill 23:35
I'm trying to do fullscreen; the only thing is that now on Google Drive, I don't know how to do it.

Dr. Sharon Hausman-Cohen 23:38
That's all right. We'll just do it this way.

Dr. Jill 23:40
Okay, we got it.

Dr. Sharon Hausman-Cohen 23:43
So anyway, she's got a bunch of different genes. Some of the ones she has [are] a neuropeptide S receptor, a diiodinase, and ESR2. None of those have the word serotonin in them because none of them are serotonergic genes. And you'll see some of them; two copies are in 20% and the estrogen one is in 7%. If you go to the next slide, you'll see that this one gene that she has, the NPSR1, is not an anxiety gene as much as it's a wakefulness gene. So yes, it's really exciting.

Dr. Jill 24:23
Ah!

Dr. Sharon Hausman-Cohen 24:24
Yes, it's really exciting.

Dr. Jill 24:25
I see the coffee there. I was just going to go there. Is it adenosine-related or related to that wakefulness?

Dr. Sharon Hausman-Cohen 24:30
This one is not adenosine. But interestingly, there's an adenosine receptor gene that's related to multiple chemical sensitivity, which is a totally separate aside. This one is related to orexin. You and I, of course, know orexin as that pathway that was

discovered after we graduated medical school and we were like, "What's that?" It's a new hormone that was discovered only about 10–15 years ago. It's a wakefulness hormone so it's kind of the opposite of GABA, which makes you sleepy. There's a whole new class of medicines that lower orexin and help people sleep. But this pathway makes you have higher orexin and higher histamine.

Dr. Sharon Hausman-Cohen 25:10
Think about antihistamines. They make you sleepy. Having a little bit of histamine can be good for focus. It makes you awake. Having a little orexin is good. But when you have two copies of this, you have 10 times as much. So if you're that awake, you feel anxious. So the thing about it—the symptoms of it—and this was totally Grace: When she got stressed, she said her family, her friends, and her employer could all tell because in front of [inaudible] she would get red and flushed, and people would think she was embarrassed. And it would just happen without control when she got stressed. And that's that histamine.

Dr. Sharon Hausman-Cohen 25:52
So once we knew what was going on, we could talk about: "Well, you can take pycnogenol, you can take quercetin, you can take bromelain, you could take regular antihistamines, and those will help that reaction." But we could also tell her about things that could help turn off that wakefulness pathway because she didn't sleep well when she got stressed. So whether she wanted to use lydioline, melatonin, or Belsomra, which is a prescription, at least now she had an understanding and options.

Dr. Jill 26:17
Oh, this is great. And I'm wondering: There are other histamine pathways, right? So there could be other reasons why someone would flush on their chest because I can hear our listeners going, "Well, I flushed like that. Do I have this gene?" And I'm guessing that this is one of the genes that can cause that, but there are probably others too, right?

Dr. Sharon Hausman-Cohen 26:33
Absolutely. There's a whole bunch of different histamine pathways because there's histamine that affects the brain, histamine that affects the gut, and histamine that affects allergies. So yes, there are a lot of reasons for all of these things. That's

actually why, in spite of the direct-to-consumer genomics movement, I think it's really great if you can have a physician as a guide. And that's why IntellxxDNA is really a collaboration. It's something that a physician orders and helps a patient interpret.

Dr. Jill 27:00
Yes. I'm glad you clarified that, because that was one of the questions at the beginning. There are a lot of consumers listening, which is great. I love to inform consumers. And you can ask your doctor to order this. We'll talk at the end about how you can do that. But I wanted to say I'm all for getting labs to patients. Nowadays, it's very common. But with this kind of complexity… And especially sometimes, people get really afraid of having this data and not knowing what to do about it. So I think in this case, it's incredibly important that you work with your doctor on the data because the pathways are complex. Some of my patients I have great respect for because they know as much as I do about certain pathways. But then I can help be the quarterback and kind of guide them on the journey.

Dr. Sharon Hausman-Cohen 27:42
And it's actually a whole different category. So it's considered a clinical decision-support tool. And because there's so much information in our genomics report, we can legally only release it to licensed healthcare professionals—MDs, DOs, naturopaths, PAs, nurse practitioners, etc.—who are licensed.

Dr. Jill 28:00
Wonderful. Ready. You just tell me when to go on.

Dr. Sharon Hausman-Cohen 28:03
Yes, this is great. So Grace also had this rare type of estrogen receptor. The reason I say rare type is that there are two parts of estrogen receptors. We classically think of high estrogen states or estrogen receptors as being related to endometriosis, fibroids, breast tenderness, and all those high estrogen things. But there's another kind of estrogen receptor called ESR2. And ESR2's job is to turn off ESR1 to keep it from getting overactive. In the absence of any estrogen, you get more inflammation, and you need even more ESR2 to calm things down. So post-menopausally, ESR2 is involved in cognition. It's involved in perimenopause-type symptoms, including

anxiety. She had a variant that's only in 7%—and you can switch the slide—that is associated with less ESR2 activity.

Dr. Sharon Hausman-Cohen 29:02
So then you go, "Well, what can we do about that?" because that makes her have more than double the risk of anxiety post-menopausally. Go ahead and switch. So things that you can do is you can use… You don't really want to use estrogen per se because that's going to give kind of a balanced ESR1 and ESR2. You want to use either genestein or rhubarb extract because that's going to bind 20 times more tightly to ESR2 than ESR1, and that's going to really help her. In fact, you have to be a little careful with hormone replacement in somebody who has this because progesterone can sometimes make anxiety symptoms worse with this SNP, and with estrogen, you're going to kind of balance the ESR1 and 2 [receptors].

Dr. Jill 29:51
I remember this one.

Dr. Sharon Hausman-Cohen 29:53
Yes, this is what we were talking about in your other patient, one of the DIO2 SNPs, which makes it that you don't convert T4 to T3, particularly in the brain. So that was a really easy switch. You switch someone from a little bit of Synthroid to a little bit of liothyronine or Cytomel. And in fact, her daughter has hypothyroidism. Now we have her daughter's genomics, but before we had her daughter's genomics, we were like: "Wait, her daughter has anxiety too. Let's switch your daughter at the same time." So that was an easy fix. And again, you don't think of thyroid as being part of anxiety.

Dr. Jill 30:29
No, or hypo[thyroidism]. Wow!

Dr. Sharon Hausman-Cohen 30:31
Yes, and it's really amazing because it's 1.5 times the risk of anxiety just when you can't make enough T3 in the brain and 1.5 times the risk of depression as well. So that was important. That's almost a 50% increased risk. So again, the reason I wanted to share this patient is that, had I not had this, I would have been talking to her about things that would increase serotonin. And that is at the top of the anxiety

panel—some SNPs that affect serotonin. But it wasn't the answer for her. So that is why it was so helpful.

Dr. Jill 31:03
I love it. And I just want to comment. Again, as a clinician. I would think: "Okay, anxiety. Is it GABA, is it serotonin, is it too much stimulants, or is it too much stress?" And none of these things would have been on the top of my radar. Estrogen SNP—T3, T4 SNP. So this is so relevant. And I'm sure if there are clinicians listening, they can understand that too—how helpful it is to have the details.

Dr. Sharon Hausman-Cohen 31:26
Do you want to do another case about cognition?

Dr. Jill 31:28
Yes.

Dr. Sharon Hausman-Cohen 31:29
Okay, go to the next one right after this one.

Dr. Jill 31:32
Perfect, okay.

Dr. Sharon Hausman-Cohen 31:34
Yes. We have an ADHD one as well, but I think that today two will probably be plenty. I chose this case because I know that a lot of the people that you work with are younger. And people are often embarrassed when they start to have word-finding problems in their 40s. But it's common. A lot of people have word-finding or memory issues in their 40s. It can be because of detox pathways that you can't transport mercury or different toxins out of your brain. It can be because of issues with different nutrients. There are so many pathways. It can be that you don't make enough choline. I mean, it goes on and on with nutritional pathways. But this was a 52-year-old engineer where it became significant enough that she was thinking she might have to switch careers. It was a big deal for her because she said it's problematic at work because if you're having problems with your math and you're an engineer, that's really hard.

Dr. Sharon Hausman-Cohen 32:25
She did have a family history of Alzheimer's. But she said her mom didn't get symptoms till she was 70, and that her father also has some memory issues, but he died of heart disease. So she was really surprised to see this coming on so early and really terrified. So we go to the next slide. Again, to remind the people who are listening about APOE4, APOE4 is that gene that we often label as the Alzheimer's gene. The reason it gets labeled that way is because 65% of people who have Alzheimer's do have at least one APOE4 gene variant. It can range from 40% to 80%, depending on the population. And each copy can convey—it depends on what it's combined with—about two- or three-fold risk, sometimes four-fold risk. If you have two copies, it can be a 13-fold risk. So this is a big deal. And what you'll see is that Sandy did have this. But she only has one copy. So that doesn't usually cause problems until the age of 65. It's called late-onset Alzheimer's.

Dr. Sharon Hausman-Cohen 33:37
So then we had to go, "Well, what else is going on?" And that's where having a robust genomics tool with hundreds of pathways that have been studied really helps. And there's a whole bunch of other pathways that we looked at [such as] genes that are right next to APOE4 that have an additive effect, kind of like a light switch, mitochondrial pathways, pathways that help to break down acetylcholine, inflammation factors, detox. We can kind of go on and on. But for Sandy, one of the biggest factors… Okay, so we used lots and lots of things. For Sandy, two of the most important SNPs related to her inflammation pathways.

Dr. Sharon Hausman-Cohen 34:14
I always say that anytime you see the letter alpha in medicine—think about the alpha male dog—α is really important. So TNF-α and IL1A refer to some important cytokines. And before the year 2020, a lot of people who weren't in medicine would have no idea what a cytokine is. But thanks to COVID, I think we've all heard of cytokines. Cytokines are these little chemicals that get released and cause an inflammatory mess, sometimes a storm of inflammation. The alpha ones, both TNF-α and IL1A, are really important because they can cross the blood-brain barrier. So they're more important for cognition and Alzheimer's risk than some of the other interleukins. This particular SNP that she had is [present] in 18% of the population—the TNF-α. And IL1A is only [present] in 9% [of the population]. But the issue with it is that it's combined with APOE4. That's a completely different gene.

Dr. Sharon Hausman-Cohen 35:20
One of the things we know, if you go to the slide, is that TNF-α can be more problematic in people with APOE4. That's because APOE4 individuals already have a problem with brain inflammation. For those of you who don't really know as much as you want about APOE4, the reason it's such a big deal is that it's not a gene that makes codes for just one protein; the product of the gene binds to 1,700 different genes throughout the genome and helps to turn them on. So it creates its own kind of storm in the brain and in the body that makes you have lots of problems. So, the issue with it when you have TNF-α and APOE4 together is that you get more inflammation. One study showed that you can have an up to six-fold increased risk of Alzheimer's because this inflammation storm and an elevated TNF-α make it so you can't clear your amyloid well. That kind of gunks up the nerves and causes neuronal cell death. That leads to dementia. So we knew we had to address TNF-α.

Dr. Jill 36:29
I love to talk about it like the garbage collector. That's really how it is, right? It's like cleaning up the waste. And we do that when we [sleep]. I love talking about sleep, so I'm just going to insert that here. This a lot of times happens when we're sleeping in our deep sleep. Some of the brain is restoring and cleaning up toxins. That's also one of the important reasons why sleep is so important for anyone dealing with cognitive issues.

Dr. Sharon Hausman-Cohen 36:49
Absolutely. And yes, I didn't really talk too much about that, so I'm glad you brought it up, Jill. But yes, we need those garbage collectors. You don't want too much inflammation in them, though, because then you get scarring. So, all of you guys have watched TV. Well, most of you people watching have probably watched TV and have heard those late-night commercials or regular commercials: "Ask your doctor about" da-da-da when they're talking about psoriasis, Crohn's disease, or any of these illnesses that are autoimmune. TNF-α is also a really important autoimmune pathway.

Dr. Sharon Hausman-Cohen 37:21
We have these drugs for autoimmune disease, but the problem with them is that they're all injectable biologics, really big molecules that don't cross the brain. They,

in fact, have studied those biologics and TNF-α inhibitors in Alzheimer's by injecting them into the spine, and they can get rapid improvement in cognition. The only problem is that it's not feasible to get a spine injection every week of a $4,000 medication. So it was more of a proof of concept. So, then you go, "Well, what can we do to lower TNF-α naturally?" Also, Sandy's not that bad. She's got mild cognitive impairment. Her score on that 1 to 30 was around a 24. But it wasn't bad enough that we would even do that. Well, it turns out there are some natural products—my favorite of them is lion's mane mushroom—that are really, really good at inhibiting TNF-α. There's a new Amazon movie called Fantastic Fungi that talks a little bit about [inaudible].

Dr. Jill 38:24
Yes. I just heard a friend say, "You must watch this." So it's on my list.

Dr. Sharon Hausman-Cohen 38:28
Yes. I think for all of us in the natural world, it's a worthwhile $4 investment. Anyway, that's one of my favorite things to lower TNF-α and one of the ones we used for Sandy. But because she was really in a crisis, we used a lot of these things. We used sulforaphane because it also helps with nerve repair and detox. We used curcumin because it is also really good at [reducing] inflammation. We had her drink more green tea. And many of these have human memory trials. The good thing is that the same things lower interleukin-1 alpha, so I didn't have to come up with a whole new list for her other inflammatory pathways.

Dr. Jill 39:04
That's why I loved what COVID taught. At least for me or anyone of us in this world, it's kind of like "no duh," because, like with LPS endotoxemia, the same cytokines have been causing damage to the body, and they underlie all kinds of heart disease, cardiovascular disease, diabetes, obesity, and mood disorders. And of course, COVID mimics that too, but only because it produces the same cytokine storm. This is actually common to a lot of different illnesses, whether it's brain dysfunction or post-COVID long haulers.

Dr. Sharon Hausman-Cohen 39:33

We'll have to get on a separate call just to talk about all that inflammation, Jill, because there are really fascinating genomics regarding NRP3, the inflammasomes interacting with the—

Dr. Jill 39:43
Well, I'm guessing it's almost like the people whose cytokines get turned on, and they don't stop. It's the same with mold in a way because, for those of us who have had mold-related illness, not only do our cytokines get turned on, it's this inflammatory pathway that perpetuates itself, and we also aren't very good at tagging the toxins to get rid of them. In general, those are some of the underlying issues.

Dr. Sharon Hausman-Cohen 40:05
Absolutely. So some people turn on inflammation and can't stop it, and that's one pathway. And then, your patient who kind of had neurolyme that we talked about, he couldn't make Nrf2 turn on the anti-inflammatory. So, it's either that you can't turn on the anti-inflammatory or you over-turn on the inflammatory. There's a lot of really interesting genomics.

Dr. Sharon Hausman-Cohen 40:27
But Sandy had her own inflammation. But we all know that mitochondrial pathways are super important for neurodegenerative diseases, whether it's Alzheimer's, Parkinson's, MS, or any of these things. She had this mitochondrial pathway that's found in about 11% of the population, but it's not the typical mitochondrial pathway that responds to fasting, CoQ10, carnitine, and alpha-lipoic acid. It's a mitochondrial pathway for synthesizing purines, which is basically a way for the mitochondria to make their own DNA. Well, if the mitochondria can't make their own DNA, you're going to have problems with their functioning because they can't stay alive. This particular SNP is addressed with folinic acid, making sure you have enough B12 and enough choline—things that wouldn't be my go-to with someone who had cognitive decline. So that was really helpful.

Dr. Sharon Hausman-Cohen 41:23
And then, when we looked at her nutrigenomics… Any time we're doing anything in functional medicine, we always look at the gut, we always look at detox, and we always look at nutrition. But this allows us, with genomics, to look at it in much

more detail. And it turns out she had genes in the choline synthesis pathway. Choline is estrogen-dependent in terms of how we make it. One of the genes involved is called PEMT. Well, what age is she? She's getting perimenopausal, so we need to support her choline synthesis because she's losing her estrogen. B6 is needed for the brain to work. So all of these things we were able to address: B6, B12, Lion's Mane, and mitochondrial vitamin support. And then within three months, her cognitive scores and cognitive skills were back where she was like, "Okay, I don't have to retire at 52," which was problematic for many reasons.

Dr. Jill 42:15
Amazing. We've been in Dale Bredesen groups and talked about these cases. What's difficult is that there are some cases of moderate to severe cognitive decline, and sometimes there's not a lot we [can do] no matter how much genetics we know, when there's a certain amount of dysfunction past a certain level. Just like if your pancreas has autoimmune type 1 diabetes and it fails and you've had so much damage, no matter what you do, you can't reverse it. The same [is true] with the brain. But in these cases, these are very exciting to me and to you as well, because in these early cases and these younger people that have it often, if there are pieces of the puzzle that we find out, like in this case, we can actually really reverse the cognitive impairment.

Dr. Sharon Hausman-Cohen 42:54
And I think what we're learning with the work of Dr. Bredesen and combining that with genomics—what we're seeing in both the study that Dr. Bredesen has been using our genomics at and in our own work at Resilient Health—is that the threshold for reversal is actually in the dementia range. I mean, not all the time, but we've had good success with people who are in early dementia as well. But I agree that the earlier you can catch it, the easier it is. So that scoring goes from 0 to 30 [where] 19 is mild dementia [up to] 20 [or] 21. If we can catch them even when they're in the mild dementia range, we can get them back to being highly functional, even sometimes back to normal. So the reason we would choose genomics is to allow for personalized medicine and be able to look at the root cause. And then, if you want to go for how people can get an Intellxx report done—

Dr. Jill 43:53
I was wondering. I see the questions coming in. They're like, "Where do we go?"

Dr. Sharon Hausman-Cohen 43:57
The biggest thing is that it's a spit kit. It's really easy. Go to the next slide. It's only ordered through clinicians. This is Dr. Pichardo in our office.

Dr. Jill 44:07
Did I go too quickly?

Dr. Sharon Hausman-Cohen 44:08
That's fine. And then, going to the next slide, if you want to learn more, we're happy to give you a list of physicians and providers who are trained on IntellxxDNA. There is a sheet on our website that you can download and take to your physician if you have an integrative or functional medicine physician that you're working with. That then tells them how to contact us and get trained. We now have online training, which makes it a lot easier. We used to have live conferences, which were really fun. But we now have both options. They can also learn more just from the website.

Dr. Jill 44:42
Awesome! I will be sure to put that in the chat. And I'm sure you guys are all excited. The worst thing is [when] you give this awesome solution [and people are] like, "Oh, where do I get it?" But you can go there. You can find a physician. Or, like Sharon said, you can actually ask your physician to order this. And it was actually through another doctor who had ordered it for my first patient. Now, I knew about it. But I will just say that, as a clinician, I felt overwhelmed. I was like, "Oh no, another test." But this is so powerful. I am totally going to be ordering this for many of my patients, at least those who want it. I think it's super powerful.

Dr. Jill 44:42
Sharon, that's such great information. I love the [slides on] anxiety and how it was stuff that we would have never suspected and then [the ones on] cognitive decline. And how many people don't have some sort of brain fog? And what I find there too [is that] even in 30 and 40[-year-olds] and young people, there's often these little SNPs or things that relate to the transport of a nutrient into the brain or a detox pathway, right?

Dr. Sharon Hausman-Cohen 45:36

Yes. Almost 20% of the population, like 18–19%, can have plenty of B12 circulating in their blood, but they can't get it into their brain. So something as simple as B12 can make a difference. And for clinicians who are watching and are worried about, "Gosh, I don't know if I want to learn this because it's going to be difficult," we've actually added what I call the key points. But it's really the cliff notes of genomics that kind of give you the easy answer as to how the gene works and the potential interventions. We also walk our new clinicians through their first three reports because it is eventually like riding a bike. But it's a lot to just change your paradigm of how you practice medicine. And like you said, a lot of physicians have said that it's been game-changing because they can get so much farther in one consult. So just know that if you are a clinician, we help you. In fact, we have a support group of fellow clinicians as well and you can also ask of people who are using it.

Dr. Jill 46:36
Yes, I felt very supported. Again, I was like, "Uh, I don't know if I want to get into a test." But it's been great, Sharon—just nothing but good. I am so grateful for your journey and the fact that it led you here. I can't say enough good about what you're doing in the world—your brilliance. I love when we get to talk about tests. And thank you for being you. Thank you for bringing this. And it's just been a delight to talk to you. I think we're going to have part two, though.

Dr. Sharon Hausman-Cohen 47:00
I would love to do part two, Jill. It's always a pleasure to talk with you. And the conversations we've had about patients have been so exciting; that's why I love doing physician walkthroughs. I'm like, "Wow, I now have hundreds of extra cases that I've heard," and I often get to hear the successes in follow-up. It's just so much fun. Both of us are women who've been around for a couple of decades. We don't have to say how many. But I think that most of us in functional medicine do what we do because we want to make a difference. And I know that for both my co-founder and me, that was why we did this. We were like, "We can do this."

Dr. Sharon Hausman-Cohen 47:35
And we're actually doing work with autism. So if any of your listeners want to hear about that work, right now we only have seven users in the United States because the pilot was done in Australia with the Australian Center for Genomic Analysis. But we're going to be training a lot more doctors in that in September so they can reach

out to us if they're interested in doing that work as well. The work is great. It's going quite well.

Dr. Jill 47:59
Fantastic. Well, thank you again, Sharon. It was so nice to have you today.

Dr. Sharon Hausman-Cohen 48:02
Thanks. Great to see you, Jill!