Announcer:

Bulletproof radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof radio with Dave Asprey. Today is going to be a very cool episode, a guy I've wanted to have on for a long time, and because of some things that you might know if you're a longtime listener, but you might not know. I had serious problems with toxic mold as a kid growing up, and I had asthma and behavioral issues and ODD and ADHD and all sorts of stuff like that. And one of the major causes, actually two of those major causes are things that were in the environment around me. You know the definition of biohacking, the art and science of changing the environment around you and inside of you so that you have full control of your own biology. Well, there are some things that really mess with a huge number of people in the environment, and one of them is toxic mold. That toxic mold is something that's the subject of a documentary that I funded and filmed myself, moldymovie.com. It's free for you to watch it.

Dave:

And the other one though, is Lyme disease coinfection. I did get diagnosed very accurately with Lyme disease later in life. In fact, my wife and I started a lab testing company that could diagnose in very much detailed what Lyme disease was, which one I had and all that. As well as something that I haven't talked about on the show at all called Bartonella. Today's expert has been practicing for almost 50 years. And he has written a book about these types of things. And you may say, "Oh. Great. I don't have any of these. It's not a problem." Here's the deal. If you are alive, you are constantly exposed to toxic mold. If your kids are in a public school, they're getting toxic mold. If you go into many buildings, you're getting exposed and the symptoms that happen are all over the place.

Dave:

So I want you to know about this because it's a major variable. And if it's not you, it can be someone in your family and you have different responses. And that's why I'm really happy to have Dr. Neil Nathan on the show. He's a guy who's written some of the most impactful books out there about how this all comes together and this Lyme versus mold versus all these other things. And his book that came out in 2018 called Toxic: Heal Your Body from Mold Toxicity, Lyme Disease, Multiple Chemical Sensitivities, and Chronic Environmental Illness, well, it's a bible for people who are thinking about this. And you might not be thinking about it, but you don't know why you suddenly get inflamed for no reason, why you have love handles day that you didn't have before, and other things like that. Or why perfume really messes with you.

Dave:

I lived all this for so much time and being able to understand why and how, and for me to piece together those pieces, I did biohack myself and I am so incredibly resilient and impactful, but there are more things that even I can do, and there's probably things you can do to not let this stuff happen to you, and to not let it happen to your family as well, because different people, different genes, different effects. So Dr. Nathan, welcome to the show.

Dr. Neil Nathan:

Thanks for having me on.

Dave:

You're known for taking patients that no one else will take. And you practice in Northern California where it's hard to practice because the medical board there is on one hand very open to functional medicine, on the other hand, there's lots of rules and regulations in California, so you're able to follow all of those. And you're taking care of the hard cases, you've done it for so much time that I'm very excited about that. So thank you.

Neil:

Okay. You're welcome. Thanks for having me.

Dave:

Now, let's go straight to... For people who don't know about toxic mold or these other chronic illnesses, you're talking about, walk me through the typical way people present when something in their environment is messing with them. Walk me through the typical way people present when something in their environment is messing with them.

Neil:

Sure. And I want to echo something you started saying, it's currently thought that there are 10 million people in this country who have some degree of mold toxicity. So we're not talking about a rare condition that no one would have any connection to whatsoever. It's common. And it comes from moldy buildings, which are ubiquitous in this country. All you need is a little bit of water damage, and we're off and running. Some of the things that scare us the most is that some of these water-damaged buildings are schools. Schools typically have very little budget. Roof leaks, can't quite fix it in a timely fashion and your kids are being exposed to this stuff. Office buildings. So it's common, and I want to echo that. Mold symptoms are all over the place, as you indicated, because mold toxicity affects inflammation in the body. And every area of the body can be inflamed by mold toxicity.

Neil:

And it can take different forms in different patients based on their genetics and based on their biochemistry. So we could see commonly, we would see fatigue. Fatigue to the point of this odd thing we call post-exertional malaise, where you do something and you get wasted afterwards for a couple of days.

Dave:

I used to have that. Yeah.

Neil:

Right? Well, it has a medical name. There's also post-exertional myalgia in which you do something and your muscles are sore way longer than they ever ought to be. We have cognitive difficulties. Difficulty with brain fog, memory, focus, concentration. Dale Bredesen, who's done a lot of breakthrough work in Alzheimer's disease has found that a large percentage of his patients who can get well from what is misdiagnosed as Alzheimer's, they've got mold toxicity.

Dave:

Dale has been on this show and he's coming back on this show and we've become friends. And I was like, "Thank God you're talking about toxic mold is one of the four big causes of Alzheimer's." It's a thing.

Neil:

It is. All types of psychological diagnoses, anxiety, depression, OCD ADHD, derealization, depersonalization where you don't feel like you're yourself, all of those can be from mold toxicity. Then we have different organ systems that can get involved. All types of neurological conditions, numbness and tingling in different parts of the body. We have respiratory conditions, asthma or difficulty breathing, shortness of breath, or what people call air hunger, which is where you feel like you can't take a deep breath, even though you're definitely breathing seemingly adequately. We have cardiac issues. Heart irregularities, palpitations.

Neil:

The autonomic nervous system is messed with, so people get what we call POTS, where they have difficulty with sitting up or standing down, all types of gastrointestinal issues, diarrhea, constipation, gas, bloating, distension, heartburn. And there's more. But the smorgasbord of symptoms is so overwhelming that if a physician doesn't know anything about mold toxicity, and many don't, they are prone to saying, if you come in and say, "Look Doc, I've got all of this stuff going on," they're prone to saying, "There's no condition I know of that can cause that. This is in your head." But they're not doing you a favor. They just don't know what's causing this.

Neil:

And that's really key here because mold toxicity is something we can diagnose and we can treat. So if you have yourself, a loved one, a friend, a neighbor, and they're suffering with a host of conditions and their doctors are scratching their heads and they don't know what they can do about it, the implication being it's in your head, but it's not, tell them about mold toxicity, because it is common and it's curable. And I hope that your listeners can really take in that this is something that we need to be aware of because it's really common.

Dave:

And it's possible for someone to have one of those symptoms or only two, and to have it turned on and off by environmental exposures. So it's one of those things where if there's something that's unexplained, you don't have to have all of this. I was lucky enough to have pretty much everything that happens there at one time or another. So I had an urgent need to biohack myself. And part of this too, I weighed 300 pounds. And gaining weight unexplainably and unexpectedly no matter what you eat, according to Daniel Amen in the documentary and just my own experience and that of many others, well, if you can't lose weight, sometimes that's part of it. And one thing you didn't mention, Neil, that I think bears note is a feeling you've probably heard from your patients. It's very hard to make decisions. Everything feels like so much work. Like you're walking through mud.

Dave:

I remember one time... I'm pretty non-reactive now. There's a few places if it's just so exceptionally moldy I just won't go there, I can feel it right when I walk in the door. But I was in San Diego, and I walked into my hotel room, I didn't pick up right off something was off. San Diego has a lot of mold. And I went to a Whole Foods and a contractor who was working on building, actually where I'm sitting right now, he's working on restoring this barn and turn into my labs, and he called me with some trivial thing.

And the mold had gotten to my brain and it did something bad and something you're going to explain, I think right after this. And I literally was like, "Look, I can't deal with this right now. How is it so freaking hard that... Why don't you just throw a match in there and burn the whole place down."

Dave:

Okay. I am generally a nice guy. That's way out of character for me. I don't yell at people who work with me or work for me. I practice kindness and all things. And then I just caught myself like, "Wait a minute. Hey. Sorry Harry." And then I went back to the hotel. I got exposed. And I stood on the dresser and I looked... I have the picture somewhere. All around the air register coming in, and it's right on the water, so moist air coming in, cold air conditioning, black slimy mold all around it. And I said, "I want..." I got a different room, and then I took a bunch of stuff to chill out. But that is how dramatic it turned me into an asshole. So I think it's really important people understand that that's a symptom as well. Can you walk through the biology of why I turned into an asshole right then?

Neil:

Well, the basic biology of that is the basic biology of all mold dysfunction.

Dave:

Can you walk through the biology of why I turned into an asshole right then?

Neil:

Well, the basic biology of that is the basic biology of all mold dysfunction, which is mold toxin enters the cells and begins to interfere with certain types of metabolism. That type of interference affects all parts of the body. It affects the brain, and brain chemistry, and brain effects. So what you're describing is common with mold toxicity. Some of those effects affect the pituitary system, which is a part of the brain. And that means most hormones are affected. So, in the same way that a woman might have a mood swing when her estrogen level is low, that kind of thing can happen to us as well, so that the adrenal, thyroid, sex hormones and other hormones of the body get disrupted. And a fluctuating pattern, which is very difficult for people to understand the mold toxic level, doesn't stay stable in the body. It fluctuates. Moves up and down.

Neil:

And so you could be better some days and worse others. And just to echo what you said, you don't have to have all of these symptoms. A few of them will suffice and a few of them can actually make you quite miserable. So again, it's just something to look for. So you want me to go into more detail or am I answering your question Dave?

Dave:

Well talk about the limbic system. What happened to turn me on that way?

Neil:

Okay. There are two parts of the brain that are specifically affected by mold toxicity, the limbic system, and what we call the vagus nerve system. The limbic system is the part of your brain that controls emotion, sensitivity, cognition, energy, and pain. The two that are unique to the limbic system are

sensitivity and emotion. So when the limbic system is messed up, mood swings, anxiety, depression, all of the psychological issues we talked about, if I get that symptom, think limbic system.

Neil:

Sensitivity is another one and it's very, very characteristic and specific. And by that, I mean sensitivity to light, sound, touch, chemicals, food, and EMF. So all of those things. If a patient tells me, "I have to wear sunglasses indoors. Loud noises startle me. I'm exposed to chemicals and I'll walk down the street and pass someone wearing a scent and my legs go weak. I may even start having a seizure. I can't think straight. I'm exhausted." Those are unique to the limbic system. And especially in the sensitive patients, which are sort of my specialty, if the limbic system is dysfunctional, it will actually prevent the body from allowing you to take what you need to get well. Because I'm going to tie it in now to the vagus nerve system. The vagus nerve is a different part of the nervous system than the limbic system, but they intimately talk to each other a lot.

Neil:

And what they control is your perception of safety. So if you don't feel safe in your body, and for example, if you don't know what person you're going to pass who's wearing a scent that's going to make you really sick for no reason, if you don't know what light you're going to be exposed to or sound, or if you don't know what building you can walk into without it making you sick within minutes of walking into the building, what you described, if you've got that going, the nervous system, this is not psychological, the nervous system tries to protect you by becoming more vigilant. It looks around into your environment and it goes, "I wonder if that's safe. Maybe it's not safe.

Neil:

And in fact, I'm not sure that's safe. And so I'm not going to let you take it." So our sensitive patients find that when they try to take the materials that would otherwise get them well, even minute doses don't work. And so one of the biggest stumbling blocks in treating people who have mold toxicity is that it's not often recognized that we've got to quiet down the limbic system and vagus nerve first, before we even address other forms of treatment.

Dave:

It's interesting because Stephen Porges has been on the show I think twice, who's the founder and the father of polyvagal theory, and one of the masters of the nervous system who focuses a lot on how to turn that down. And you are to my experience, or to my knowledge, the first practitioner to really step up and say you've got to deal with those two things. And if someone's listening to the show and you're saying, "Okay. Dave, this sounds a little out there," that idea that you can develop hypervigilance to the environment, it's real. In fact, it's really been informative for me in terms of figuring out the environments that humans thrive in, even people without mold. Removing the things that feel big to me. So I think there was a time in my life where I was running at 5% to 10% of where I am now.

Dave:

And so if you're running at 5% or 10% of your capability and something comes in and takes you down 1% or something, that could be 20% of how you feel that day. So what that means, I can say, you know what? I can tell you breathing fragrances is bad for you. And I can tell you all the science about how it disrupts your endocrine system, even if you're perfectly healthy. And it's not a good practice, but it shouldn't take you out because your resilience is through the floor. So my practice as a human being has

been maximizing my resilience. So I can go past people who wear perfume and go, "It doesn't smell very good." And I know it's not good for me, but I don't feel like I'm going to die and want to run away. And there's been times in my life where I literally would be disabled, I have to put on the dark glasses and I get a migraine or just really, really be knocked out.

Dave:

And there's times I'd walk into a room and I would feel terror, abject terror. Why? I couldn't tell you. I just know I felt it. And what it was is my body knew there was mold in the room before I even had tied the two together. I just knew I have to get out of here. And people are like, "What the heck's going on? There's nothing wrong with this." It turns out there is something wrong, and I hadn't made the connection. So that's my body serving me to keep me out of things that are actually causing me harm, but doing it in a way that is harmful in and of itself, if that makes sense.

Neil:

Sure. It's a protective mechanism. The whole limbic system thing. The body's not trying to hurt you. It's trying to protect you. And many, not all, but many of our patients who get mold toxicity become exquisitely sensitive to the presence of mold and scents. Now that's protective on one hand, but limiting in others.

Dave:

That's a pain in the ass. Yeah.

Neil:

Yeah. But it's real. And again, human beings have a tendency to view the entire world through their own eyes, which is, "I'm not reacting to that, why are you? I mean, there must be something wrong with you, because I'm okay with this." And it doesn't take into account that we're all different. We're all biochemically and genetically different. And if you are suffering with mold toxicity, your sensitivity, as you have experienced, goes through the roof. And what I've learned is that my sensitive patients are excellent parameters, never making it up. They're never smelling something that's not there. They're just smelling it at a level that other people can't because their nervous system has been so sensitized.

Neil:

Now we know that dogs can do that, for example, we don't make a big deal about that. I've got two dogs, they can smell things that I can't. And well of course they can. They're dogs. However, here we have sensitized patients. A mold toxin has sensitized them. And I want to make a plea that if somebody tells you that they are experiencing a really horrible experience in a room that is not bothering you, believe them.

Dave:

Yeah. Thank you for saying that. It's exactly the right thing to do, because they're not crazy. And it's insulting, actually, to take someone who's having an experience and tell them your experience isn't real, "You're nuts." I ran into some real challenges early on here because I was dealing with this as a child even, and not really aware of it until re-exposure in my early 20s. And in fact, when I was re-exposed, I gained 30 pounds after I'd already lost 50 of the 100 pounds I had to lose. And I just remember thinking, "God. I must be nuts." And I go to the doctor and the doctor was basically useless. I even proposed, "Hey. It might be toxic mold or yeast or something." And it was like, "No. You don't have AIDS. It can't be

that." Because it turns out if you have AIDS that mold or yeast, Kaposi sarcoma and things like this can be a problem. But it was real.

Dave:

And the reason I did the documentary, which was a very substantial amount of work to do and flying all over the country and putting together editing team and all, this was about three years ago I think it, I did it because I wanted people who were being called crazy to be able to ask their spouse or their doctor, say, "Hey. Could you watch this and just hear from real doctors and hear from other people who have been exposed, including doctors have been exposed?" So if you feel like you're alone, you're not actually alone, because like you said, your numbers are 10 million people.

Dave:

I know there's 100 million structures in the U.S. from the experts that I've interviewed that have water damage. And genetically some of the early people doing research on this, when they look at the HLA-DR4 genes, it looks like about a third of us, maybe 25%, somewhere in there, have some genes that make us more susceptible, but anyone could get one of the symptoms or some of the symptoms. So I think it's a meaningful societal thing affecting kids, affecting adults, affecting relationships, and probably affecting susceptibility to... I don't know, viral infections that cause systemic inflammation.

Neil:

Yes. And if someone gets a viral infection and they have mold toxicity, it makes them much, much worse. Because the way the immune system deals with an infection, and I'll add or allergy, seasonal allergies will do the same thing, adds another whole layer of what we call inflammatory cytokine inflammation to an already inflamed system. So our patients get worse and it lasts longer.

Dave:

I live at the arena of cytokines. A lot of people haven't heard of cytokines, but we certainly have cytokines storms are something that everyone's heard about in the media now because of COVID. It turns out cytokine storms have been a regular part of my life for a couple decades because I get exposed, I get a cytokine storm. And I know exactly how to manage it, I know which herbs, I know exactly what to do, which toxins to bind.

Dave:

I've gone from... It could be a month if I'm exposed to mold going back 20 years where I would just feel like a zombie and I would just sludge through the day, to generally it's not more than 24 hours for a really severe exposure, and usually it's not more than 10 or 15, 20 minutes to the point where it's just not that big of a deal. Sort of like, "Oh. I've got a splinter, let me take it out." But I think I'm rare from a mold perspective. Do you get people turn it off all the way where they just don't have that response at all? They don't get any inflammatory cytokines, even though they've been exposed?

Neil:

Well, there's two things I think you're talking about here. One is people who don't have a propensity and have not had mold toxicity can be exposed and not react much at all. Maybe a little bit. Maybe their eyes will sting or burn, or they'll have a little bit of throat soreness. For people who have had mold toxicity and then recover, to some extent they will always be more vulnerable. It's almost like the body goes back into a memory of, "Oh yeah. I remember when I reacted to that." Not as bad. The better you

can care for it, the better you can be. So in your case, it's a good example. You've had severe mold toxicity, but you've learned that if I'm re-exposed I can just take my binders, I can just take materials that will quiet this reaction, and I can turn it off fairly quickly.

Dave:

I have a theory there that this comes from mitochondria. Your mitochondria are ancient bacteria, and what enemy did ancient bacteria have? Oh, it was mold. So mold makes antibiotics, kills bacteria, they're both fighting over the same piece of cheese or the same dead dinosaur. The fights been going on for over a billion years or something. Two billion probably. And from that perspective, I believe that the mitochondrial have their own bacteria-level algorithmic intelligence as a distributed system and it feels like it just gets whacked. And the reason I say that is because physical weakness happens. Like my grip strength drops through the floor.

Dave:

And when I say it, this is a dynamometer, this is my grip strength meter. I'm stronger in my grip strength than an 18-year-old when I'm normal. And when I get exposed to mold, my grip strength drops through the floor and I just can't squeeze. And okay. Some of that's neurological, but some of it is that lack of breathing. I think it's a metabolic thing. Am I nuts for that theory? Is there any validity to it?

Neil:

No. But alas, you're not the first to come up with it.

Dave:

Oh. I'm not? Oh. Who did that?

Neil:

Bob Naviaux.

Dave:

Oh. Really? Okay. I haven't seen Bob's work.

Neil:

Are you aware of the cell danger response?

Dave:

I am not aware of the cell danger response.

Neil:

Oh my goodness. You're in for a treat. Bob Naviaux is an MD, is a professor of genetics and pediatrics at UC San Diego. And he has a fabulous lab there that he's doing some of the best work in the world on this particular subject. He's been studying this for a long time. In 2013, he published a landmark paper, simply called The Cell Danger Response in the journal Mitochondrion. If you could simply google Naviaux, cell danger response, you'll get a host of papers that Bob has written, all published and peer-reviewed journals. What he realized and put together is when a cell is exposed to either an infectious

agent or a toxin, it goes through a biochemical dance, which is age old, millennial old, that was protective in nature to protect the cell. It is the mitochondria in the cell that's got the ball rolling.

Neil:

Mitochondria are exquisitely sensitive to electrical changes inside the cell, and when exposed to a toxin or an infectious agent, there is a drop in voltage in the cell millivoltage, the mitochondria react, and they set the cell danger response in motion, which includes shutting down the cell so that the infecting organism can't do anything with it. It's an intentional shutting down that things that seem different... So for example, all patients with mold toxicity have mitochondrial dysfunction. They have to, because it comes from them. All patients with mold toxicity don't methylate very well because intentionally the mitochondria signal, the cells to stop methylating. For example, a virus can't replicate unless it hijacks your methylation chemistry. So what do we do? We shut it down so that the virus can't do that. There's a series of biochemical events Dr. Naviaux has laid out and subsequently he's published an even a larger model of what really amounts to most chronic illness is triggered by this cell danger response.

Neil:

And so if we're talking about healing that, we need to understand the cell danger response, to understand where you are in the cell danger response cycle. So another important realization here is, many physicians have realized that if you have this issue, your mitochondria aren't functioning. So what do they do? They give you supplements that help mitochondria function better. Things like CoQ10, L-Taurine, L-Carnitine, D-ribose, whatever your favorites are. Here's the problem. When the cell is shut down in the first phase of the cell danger response, it's on survival mode. It can't use it. It can't do anything with it. In fact, it may hurt the cell. It's got to figure out what to do with it, because it's just trying to save its own life. And that translates to the whole level of the organism.

Neil:

So you can't give supplements that the body needs at that point until you get rid of the toxin or the infection or both, or you're not going anywhere. And that's a landmark finding because so many physicians don't understand that and they start giving things that should help you early on without realizing that body's not ready for it.

Dave:

Have toxic mold. There's a study, a very, very old study that shows something like a 15% increase in life, or either a reduction in mortality or an extension of life even, just from charcoal, because it's binding toxins over time in your life. And I noticed quite often, and people they take it and suddenly they feel better and it's removing some of the toxins. Talk to me about charcoal and other binders that would remove toxins to lower the cell danger response so you could turn your mitochondria back on.

Neil:

Sure. Well, we've got to back up.

Dave:

Okay.

Neil:

The first thing you want to do, if we're talking about mold toxicity is make the diagnosis and know what molds we're talking about.

Dave:

Oh. Well of course. Please go there first. That's important.

Neil:

All binders don't work alike and all binders don't work on all toxins. So one of the issues is you need to know what toxins are in the body in order to put together a treatment program that will be comprehensive. And this just makes sense. If I'm only removing two of the four major toxin groups that are in your body, you won't get 50% better. You're going to still be toxic. So you've got to get everything out of the body. So if we look at the major toxin groups, ochratoxin, for example, being the most common that we see in mold toxicity.

Dave:

And that's the one by the way, in coffee, chocolate, red wine and beer. And that's why I filter it out of my coffee because I'm having an increased exposure if you're getting environmentally, at least for me, that's subscript and I think for a lot of other people. So OTA is my favorite mold toxin, just for commentary.

Neil:

And we can talk about it. But there are specific binders for that. There are specific binders for trichothecenes, aflatoxin and gliotoxin which are the main ones that we will see. So the first thing you need to do is get a urine test, which will allow you to know what's in your body.

Dave:

When you say which toxins, this is not which mold is in your body, this is which toxin is produced by mold that's in your body, which may mean the molds in your body or may mean you're getting it from your environment, just getting the toxin itself. So people are new to mold, I think that distinction is important.

Neil:

No, no. That's absolutely correct. It's the toxin that's doing all of it. But as you're also pointing out, some people colonize, meaning the mold has been exposed to them for so long and their immune system has gotten weakened so that mold actually starts growing usually in the gut and sinus areas. So even if they leave a moldy environment, they could have left it 15 years ago, they're still carrying it in their body, making it until they actually get rid of it. So there's three main steps in diagnosing and treating mold toxicity. One, getting the urine test and knowing it's there. There are other tests, but there's nothing as far as I know, that is more specific or useful.

Neil:

Second, you need to evaluate your environment. You've got to know where it is. You can't get well if you're living in a moldy environment, whether it be your home or work, car, relative's house, wherever it's coming from, you need to know that so that you cannot be there. As you pointed out earlier, within

minutes of exposure to a moldy environment, a mold sensitive patients can get much, much worse, and that can last for days if it's not dealt with immediately. So-

Dave:

That deserves underlining. At least once a week, I have a conversation with someone who reaches out and says, "Dave, I just found out I have mold, which I do." And the answer is always the same, "Get the hell out of your house." And they're saying, "What? It's a pandemic." It doesn't matter, but you need to go somewhere else. And I've told this to people with 25-bedroom mansions they just build. I mean, "Yeah. Sorry. They built it wrong. Look at your air tests and look at your urine tests and look at the quality of your life and look at how your kid's behavior is. This isn't one of the things to do next week. Tonight, get a hotel and get out and leave most of your stuff behind." So just to underline the importance of that, if you know you're in a moldy environment, your brain's going to be like, "Oh. But it's so overwhelming to leave." It'll be less overwhelming after you leave. You just have to do it. Keep going, but that just deserves an underline.

Neil:

I'll echo that. I got an email today from a physician friend of mine who has been struggling with mold and Lyme. And she keeps telling me how sick she gets every time she goes into her home. And I went, "Duh. Get out of your home." Now I've told her that several times and I got an email today going, "Thank you for pushing me." She said, "My brain wasn't working well enough to take in that I actually had to get out of my home," which is affecting her child as well. And she gave me just a nice thank you note. "Thank you for pushing me. I just didn't have the judgment to act at the level that I needed to." Because that's how mold affects people. But we can go on from there. So you've got to evaluate your environment and your environment's got to be safe.

Neil:

Second, you've got to use the binders that are correct for the toxins that are in your body. And third, if you've colonized, you've got to take antifungals for the sinus and gut areas to get it out of there. And here's the good news. It's treatable. You can cure it, you can fix it. But you can't just ignore it. It will not go away.

Dave:

The fact that there's hope like this, it was not like that in 2005 or even 2010, where we could be programmatic. You couldn't get a good urinary mycotoxin thing. The U.S. military had some things and we had kind of a broad spectrum. Take everything that can bind to everything. And that was certainly something that I started with. What happens if you take broad spectrum binders for long periods of time?

Neil:

Well, if you have mold toxicity they can help. You do want to be specific. So I'm going to answer that question in two different ways. So first of all, it can help you. The problem is you don't know how long to take it for, because you can't know when the mold is out of your body. The only way I know of to do that is to get a repeat mold test, that shows that you've cleared it. If you feel better and not completely well, and you stop treatment and you stop taking your binders, mold will grow back. And I've seen this way too often. So it's important not to try to do this on your own or without knowing what you're doing. It's

difficult enough and tricky enough that you kind of... You need to be working with someone who knows what they're doing and you can't just do it.

Neil:

The other aspect of your question is I think, how safe is it to take binders for a long time? And that's a very interesting question. Many people in the naturopathic community are putting out warnings of, "Oh no. You can't take charcoal regularly for a long period of time," or "You can't take clay for a long period of time," or "Chlorella for a long period of time. It will deplete your body of nutrients." I've been doing this for 20 years and I've given large amounts of binders to people for years on end, I have not seen that. So perhaps in a medical study, a minute amount of nutrients might be lost due to binders. I've not seen it. The flip side of that is more important.

Neil:

If there's toxins in your body... And I assure every listener you've got, your body is loaded with toxins. There are 80,000 chemicals in this world, and we don't even know how to measure most of them, and we don't even know what most of them do. So I too have had mold toxicity by the way. And my view is, and I tell this to my patients, as far as I'm concerned, my toxin exposure is so enormous and so constant, even leaving clean and eating organic and doing all the right things that I take binders on a daily basis and I plan on doing so for the rest of my earthly life.

Dave:

Hallelujah brother. That is one of the ways to live longer. It's in Superhuman and my How to Live to 180 book. If you're not doing that or better yet, there are people, "Oh. I'm going to get all my vitamins from Mother Nature." And it's a great thing. Get all of your toxins from Mother Nature too. Because we are living under a load that's bigger than it was. What binders do you take on a regular basis? What are the ones that you've like?

Neil:

Okay. I personally take bentonite clay, charcoal and chlorella every day.

Dave:

I am of the same mindset. I don't do chlorella daily, I do it whenever I eat fish and I am not opposed to doing every day, I just don't have the habit. But I take charcoal on a daily basis, I even make one for Bulletproof, and there are other brands that work, mine is an extra fine particle for a specific reason. And I maybe once every couple of weeks I do one dose of cholestyramine which is a prescription binder that sticks to your bile and makes you excrete it. What do you think about cholestyramine?

Neil:

It's okay. It's a fairly benign medication. It tends to be constipating for many people. If you need it, if you have ochratoxin in you, it's the best binder for ochratoxin.

Dave:

I tend to find that I never want it in me again, so I just do it for prophylactically.

Neil:

I personally don't take that one on a regular basis. I have taken Welchol for the same purpose. It's a little bit easier and way better tasting, meaning it has no taste. So it's okay. I don't know how necessary it is. I think we can all intuitively follow our own guides and guidelines as to what we think would be the best thing for us.

Dave:

Some people worry about the aluminum content of bentonite clay. What's your take on that?

Neil:

To a certain extent, a teeny bit of aluminum is in it. I do a lot of heavy metal toxicity measurements, I have not seen anybody get aluminum-toxic from prolonged use of bentonite clay. Again, I know it's out there, but I don't see it.

Dave:

I love that answer. And if you're new to this listening and saying, "You mean I should be binding toxins?" I would consider binding toxins to be at least as important as taking vitamins. And in that way you can stop doing the bad stuff before you start amplifying the good stuff. Is that a good order of operations from your perspective as well?

Neil:

Sure. I'm not a big fan of multivitamins actually, because there's too little of everything in there. I know that-

Dave:

Yeah. Not multis. I mean targeted supplements.

Neil:

Okay. That's okay.

Dave:

Yeah. I'm also opposed to multis. They're mostly a waste of money.

Neil:

Okay. So we're in agreement. To me it's about measuring, learning what a body needs and giving the body what they need. And so, yes, I'm a big fan of that.

Dave:

And a lot of times it's kind of flipped on its head because people say, "I got to take more of the good stuff." It's like, "Now do less of the bad stuff."

Neil:

Well, to amplify that, it isn't just about taking the good stuff it's about being aware of and including detoxification in your daily regimen as well, improving your body's ability to get rid of the toxins that are in us, that there's no question about that. So again, if you want my own part of my daily regimen is I'm a

huge hot tub fan, and I probably take a hot tub four or five days a week. Sweating is a superb way to remove toxins. If one is inclined to do a sauna on a regular basis, great. Epsom salt bath, great. Whatever you're drawn to doing, that would be very helpful to help the body get rid of this stuff.

Dave:

A beautiful recommendation. I like an infrared sauna and hot tubs, as long as they're not in a moldy building. I've been a little outspoken, having been diagnosed, having run a lab company for a little while that did testing for Lyme actually, and some molds, but more for Lyme and other environmental exposures. I think that 80% or 90% of people who think they have Lyme disease actually have toxic mold.

Neil:

No. I don't know if that it's that high, but it is high. I'll give you some other numbers. I do some teaching with Rich Horowitz, who is considered by many to be one of the top Lyme docs in the country. And after Rich learned about mold in his patients who are treating Lyme and not improving, he has found that 70% of them have mold and that's the stumbling block. So I won't go as high as 90. But the problem is mold toxin and Lyme, and the coinfection Bartonella give such similar symptoms that you can't tease it apart symptomatically. And if you're not thinking mold and you are dealing with a Lyme patient, you really need to check mold early on because that may need to be addressed before the patient can even take antibiotics.

Neil:

If you've got a sensitive patient and they can barely take the things you want to give them for mold, there's no way they're going to handle the antibiotics for Lyme until you get the mold out of there. And if you have both, the vast majority of people need to treat the mold first, or they're not going to make any headway against the Lyme. So very important. It's one of the things that Andy and I might agree on.

Dave:

You mentioned something else that I've never covered on the show. And I'm going to talk about this for just a minute to set the stage for you. When I was somewhere around 10 years old, I woke up in a cabin. It was in Colorado. And I felt something on my neck. And I thought it was a mouse that I'd heard earlier, because it was a little family camping trip. So I reached up to grab the mouse and I was going to just squeeze it to kill it or something, I don't know, I was asleep and I was a kid and it bit me on the thumb. So I threw it as hard as I could at the ground and it never hit the ground. And I said, "What the heck?" And so I scrambled around trying to find a flashlight, I finally turned on the flashlight, and there's nothing there.

Dave:

And I knew that I wasn't dreaming and I'd felt these two little tingly spots right under my ear on the right side of my neck. So I woke up my parents and they thought I was crazy. And eventually they believed me and we looked around and we found a bat in the corner of the room. And it actually was a vampire bat. And one of my claims to fame before Bulletproof is that I'm the only person ever to have been bitten by a vampire bat in the U.S. So I did get the rabies shots. The bat did not have rabies. We captured it, we brought it to the hospital. This is a proven thing from a long time ago. And strangely enough, about, oh three, four months later, I started getting more joint pain than I'd already had, I started getting stretch

marks, I started gaining weight, behavioral issues, massive pain throughout the body, really bad stretch marks, puffiness everywhere, weight gain, really amazing knee pain, pain in my feet.

Dave:

And I just kind of figured that was how it was supposed to be. Just got used to feeling that pain. And years later, after having actually stopped all those symptoms with what I do, a friend of mine said Dave, "You have all the signs of having had Bartonella as a kid." It turns out 70% of vampire bats have Bartonella. So the odds are exceptionally high that that's where I got it. So most people listening, don't even know what Bartonella is. Can you talk about what it is versus Lyme disease and all these other things, how people get it, and how common it is.

Neil:

Sure. So Bartonella is another bacteria that you can get, not just from ticks, but from other sources as well. So [inaudible 00:45:47] cats are probably number one. 40% of cats carry Bartonella. Some dogs do as well. You can get it from flea bites, you can get it from some mosquito bites or from black flies or horse flies. But the one that has the most PR attached to it is getting it from ticks. So when a tick bites you, it first takes some of your blood and puts it into its stomach and it kind of sits there for a while. And then it regurgitates that blood after a while back into your body.

Neil:

Dr. Joe Burrascano who's one of the Lyme experts in this world calls it, "Nature's dirty needle," because when it injects back into you it injects not only the Lyme bacteria, if it has it, but also Bartonella, Babesia, a couple of bacteria, chlamydia, mycoplasma, Ehrlichia. There's a host of other bacterial species that can be injected into you from that. In these ticks studies that have been done, in most communities, about 40% of the ticks carry Lyme. The bacteria of Lyme is called Borrelia.

Dave:

These are deer ticks you're talking about not all tick species?

Neil:

Deer ticks.

Dave:

Okay.

Neil:

Deer ticks. And 40% also carry Bartonella, and another 10% or 15% carry Babesia, about 8% Ehrlichia. So for a long time, it was not recognized that many people who had Lyme also had Bartonella. And as in your case, you can get Bartonella from other sources. So you don't have to get it from the tick bite. That may not have been the source. So Bartonella is a bacteria that is also like Lyme called a stealth infection. And what we mean by stealth infection is it doesn't float around in the bloodstream, but it burrows into cells making them intracellular. And in there, they both mess with your immune system so that your immune system will ignore it and not attack it as it normally would. And it's got a number of mechanisms for doing that. So it releases the way Lyme does these toxins into your body also, in

addition to the inflammatory nature of what it does to the body, which is remarkably similar to what mold does.

Neil:

So one's an infection, one's a toxin, but they both stimulate the immune system to have an inflammatory reaction in an extremely similar way and many of the symptoms are quite similar. So it can be tricky for a physician who understands this, most don't, to tease them apart and figure out, "Okay. Does my patient have mold or Lyme or Bartonella or and Lyme or and Bartonella?" Or, "Which of these does my patient have? What do I need to treat in what order?" So that's a quick Cliff Notes version of Bartonella.

Dave:

Well, it's a wonderful one. And that's also something that can be treated, but it's tricky to treat. And it's one of the things you specialize in. And in this episode, I don't think we'll get into treatments. But in your book, which is really well-constructed, you talk about rebooting the immune system, rebooting the nervous system, rebooting the endocrine system, rebooting the gastrointestinal system, and then sort of stepping through in an orderly process on how to fix these different things and get the body going back again, and along the way, obviously figuring out which of these is going on. There's two other things that people might not know about. And certainly I hear from people in the Bulletproof community on Instagram and in chats and Facebook and conferences and all this stuff that I do, there's mast cell activation syndrome, and there's carbon monoxide poisoning in porphyria. Can you talk about those for a little while?

Neil:

I could. Let's talk about mast cell activation first because it's much more common and much more relevant to people. In the same way that mold toxin interferes with the limbic system and the vagus nerve, it can also trigger in the majority of patients, this thing called mast cell activation. So let's talk about mast cells. What are they? Mast cells are a type of immune cells that bridges or connects the nervous system and the immune system. So it is a direct bridge of communication between them. And so they're out there monitoring your environment, a little bit the way the mitochondria do, but on a cellular level, monitoring it for infectious agents, monitoring it for toxins. And if they're there, they react by releasing their contents. And mast cells have within them over 200 different biochemical mediators, most of which are inflammatory. Main one is histamine. Mast cell activation refers to the fact that in quite a few patients...

Neil:

It used to be thought that it was extremely rare, actually turns out it's present in at least 10% of the population, and in a much higher percentage of our patients with mold and Lyme, meaning probably in the 60% to 70% category. And that means that adds another dimension of inflammation to an already inflamed system. It too needs to be treated early on or patients won't quiet down enough to improve. The symptoms of mast cell activation can be the same complicated symptoms that Lyme and mold have, the same multi-system issues, neurological symptoms, psychological symptoms, breathing, GI symptoms, gut, itching, hives, rashes. It's so across the board and so different for all people.

Neil:

That again, it's just one of those things that you need to include in thinking about when you've got patients who are across the board complicated. And the beauty is once again, it's treatable. That if you identify it, there are a number of both supplements that are natural and medications that can quiet these mast cells down and allow people to improve, sometimes pretty dramatically and quickly.

Dave:

What are the top natural supplements that turn down hives and things like that?

Neil:

The top ones that we tend to use quercetin is number one, there's a supplement called Perimine which is an extract of perilla seed. There's a supplement called AllQlear which is a tryptase inhibitor. There's the enzyme DAO that stands for diamine oxide. It is an enzyme that breaks histamine down and often the body doesn't make enough of it so that the histamine release keeps prolonging itself in the body. There's a number of others but those are the main ones that I use.

Dave:

Do you like black seed oil? Black cumin seed oil?

Neil:

For that purpose?

Dave:

Yeah.

Neil:

I'm not sure how well it works for that purpose. I've not used it that way.

Dave:

I've seen studies that looked pretty convincing. And if I'm going to eat something that has more histamine than I like, I will take DAO, I will take that and I'll take maybe 20% of Benadryl. I can eat foods that won't give me a headache and afterwards... I was for much of my life, I would eat something that had histamine in it and I would get a really intensely swollen forehead. I would look like a cling-on for a little while, and you can actually see it. And it was this big thing and it was of course, really uncomfortable. And then my brain would sort of turn off because histamine is a neurotransmitter as well. Right? So if you're listening to this and saying, "Oh. Sometimes chocolate does this, sometimes it doesn't." It's well, chocolate can have histamine because of the way it's fermented. And so you go through all these things and you realize it's not that you're crazy, it's that there's stuff in there, and you might be responding in a certain way and there's hacks for it. But ideally you train the body to not do that. And that's becoming more resilient.

Neil:

When it comes to that process, let me add that a tip off that you have mast cell activation is if you get symptoms immediately after eating. That means within 15 or 20 minutes. That other things will come on later. So if you get palpitations, itching, rash, swelling, abdominal pain, and diarrhea within 15 or 20 minutes of eating, that's virtually always mast cell activation. That's not an allergy. And the other tip-off

is that it fluctuates. It's not an allergy. So most people think what is it that I'm allergic to? Because I could eat that yesterday and I didn't have any reaction to it and today I can't do that. Because that is typical as well. It's not what you eat, it's how activated the mast cells are when you eat.

Neil:

So at an activated state, you can actually react to drinking water. And when people say that, they'll say, "That's crazy. You can't react to water." If your mast cells are activated enough, you can. So again, the take home point is if you're getting symptoms quickly after eating, think about mast cell activation because we can treat it.

Dave:

That is fantastic. I've definitely seen people where right afterwards you feel that or I got a food baby in 10 minutes. That's not SIBO if it takes 10 minutes to get swelling. Right?

Neil:

Exactly. Correct. And people attribute it to that, but it can't come on that fast. SIBO.

Dave:

Now, if you have something wrong in your gut like SIBO, is that more likely to mean that you have mast cell activation syndrome?

Neil:

Not necessarily. I mean, SIBO is mildly complicated and basically just means that your gut and your microbiome is messed up. Keep in mind that many people are treating SIBO without looking at what's causing the SIBO. And again, I want to emphasize if you have candida or mold toxicity and you try to treat SIBO in the ways we do, you won't get very far, you've got to get the more toxic elements out, or the body can't heal itself. A common mistake I see in my colleagues, which is in functional medicine, you're taught from the get-go, fix the gut, everything else comes afterwards. That's true if you're not very sick. But if you have mold toxicity, you won't be able to fix that gut until you get the mold and the candida out. So once again, you need to know what to treat in what order.

Dave:

Well, I love it that you've also put the order in your book. So you sort of tell people do this first, then do this, which is fantastic. You said, though, it's not what you eat, it's how activated your mast cells are when you eat it. Isn't part of it what you eat? I mean, I noticed that if you give me leftovers that are two days old, I'm much more likely to get activated than if I eat fresh cooked food. So isn't there some degree of bacterial breakdown and histamine and biogenic amine formation in the food that's a part of this whole equation?

Neil:

Sure. I was merely trying to emphasize that it had more to do with the reactivity of the mast cells than what you eat. You're right. And again, about 50% of people who have mast cell activation clearly benefit from a low histamine diet. But about 50% of people don't benefit from it at all. So I basically tell all of my mast cell patients from the start, we're going to go on a low histamine diet for a couple of weeks, and

let's see how you do. If you're better, stay on it, if not, don't. Because, well, it's a restrictive diet and you don't want to stay on a restrictive diet unless it's doing you a clear benefit.

Dave:

Part of the Bulletproof supplement stack, it is around supporting detox in the body. So I make a glutathione, there's many forms of glutathione out there that you can buy today. When I first got into glutathione, there was only one liposomal form on the market. I was looking at starting to market that around the year 2001, actually. And it's evolved so much. There's many different forms that can work and can be absorbed through the gut now. So that's evolved. But there's also calcium D-glucarate to support the secondary backup pathway for detox called glucuronidation, which is the hardest word to say. And then of course, Apple cider vinegar for acetylation. You did a conference just last year back when conferences still happened, at least in person, the first annual Environmental Toxins and Genomics Conference, the one I wish I would have gone to, but you had presentations in there about those pathways, other pathways, and what's called the CYP pathway in the liver. Can you walk listeners through how detox in the liver works and which one's the most important, which happens first. Kind of give us the overview.

Neil:

I sure can. And actually at that meeting where I actually talked about the cell danger response, some of the other practitioners had pieces of a puzzle we've been trying to put together for a while. Beth O'Hara, Emily Givler, Lari Young all presented pieces of that puzzle that you're referring to. Because I've been working for a long time to try to understand how exactly does each mycotoxin get detoxified by the body. Because if I could figure that out, we could assist detoxification and make that work. So Beth had a piece, Emily had a piece, Lari had a piece and we put it all together. So-

Dave:

Wow.

Neil:

... we have subsequently done that. And all of us have been lecturing about what we've found. We've basically put together a master table of the mycotoxins and how each one is detoxified by the medical literature. In other words, for everything that we talk about-

Dave:

Wow.

Neil:

... we can quote chapter and verse how that works. Ain't that cool?

Dave:

Oh my goodness. So-

Neil:

So to answer your question, glucuronidation, which does roll off the tongue, is probably the major mechanism used. So if we talk detoxification, we have what people call phase one detoxification and

phase two detoxification. Phase one detoxification basically involves the liver changing the molecular structure of toxins. In phase two, it changes them even further to make them water soluble so the body can excrete them. And what we've got in our table are both nutritionally, the foods and the supplements that can enhance each phase of detoxification that corresponds to each toxin. So for example, there are four main ways that the body detoxifies ochratoxin, which is... we've talked about a little bit, is the most common of the mold toxins that people have to deal with. Glucuronidation is the most common. So is amino acid conjugation. So is binding it to glutathione conjugation. Sorry. What-

Dave:

Oh. So it's basically calcium D-glucarate then glutathione and acetylation kind of in that order is the model that I've been using. But I don't know which toxins go where. I just say do all three, because you need all three if you're going to live in a toxic world anyway.

Neil:

And it's partly true. Right. So well now you've got your mold toxin report. You can look on this table and you can go, "Ochratoxin. These are the foods that I want to take." Mostly cruciferous vegetables, salmon, krill, krill oil, and then we could supplement with things like resveratrol, curcumin, quercetin, CBD, all of those are documented at enhancing the detoxification pathways, so we can assist that body in getting rid of the toxins better. So we're really excited about this little table. If your listeners want to access it, it's available in a newsletter that I wrote on my website. So if people simply go to my website, which is neilnathanmd.com. Very simple. If you go to the blog section of my newsletter, all of my old newsletters are there and this one is from two ago. And so this table is there for either patients or practitioners. And Emily and Beth and I are lecturing on this, literally all over the country to bring this information forward, to really help people do this whole thing better.

Dave:

Thank you for doing that work. I just looked it up as we're talking and you've got some amazing stuff in here, including things like genistein, which is something that comes from soy that generally I don't recommend because it gets in the way of your estrogen pathways. But if you're looking at ochratoxin A and something called DON... That's also vomitoxin. Right? Yeah. It does exactly what you think it does. Causes nausea, because that's why it's called vomitoxin. It turns out that's actually good for you. I didn't know that I'm just pulling this up in here. So having that roadmap. I like to say, especially if you eat processed food or stuff at restaurants, you generally are getting some of all these toxins on a regular basis, why let them hang around? I like to take this general stack of things. But if you know what's going on, because you've done a lab test... And I'm sure you recommend the lab tests on your website as well. I think there's only one company that does urine mycotoxins [inaudible 01:04:32]. Right?

Neil:

No. There are four now. And the market is increasing. The two that have been around the longest and do the best job are the RealTime Laboratory and Great Plains Laboratory. Right. And they both do completely different technologies, and you get very different information from them. So sometimes patients get confused and they say, "Why does one lab show that I have it and one doesn't?" Because they're not measuring the same thing in the same way. So I often find getting both labs really helpful because it gives me the bigger picture of what's going on.

Dave:

Wow. You are a true expert. And this chart is actually really impactful. I will write a blog post about it and reference people to this as well, because it's important news. There's something in here in the chart as I'm looking at it that I think listeners would also appreciate. So calcium D-glucarate is one of my favorite supplements because not only does it help with just the general detox here, it helps men convert estrogen... or it helps us not convert, it helps us remove estrogen from the body. So if you convert your testosterone to estrogen and you take this stuff, you can reduce extra estrogen that you don't need. But that also means it binds to the xenoestrogens which are made by toxic mold. So zearalenone, which is something that... Oh. By the way, if you eat industrial meat from feedlots, which you should never do if you want to live a long time and you value animals and you value soil and the planet and all that kind of stuff.

Dave:

By the way, you can eat grass-fed meat, that stuff's good for you. But if you eat that stuff, you're getting zearalenone. This is a mold toxin that gets purified into zeranol, which is something they sell a waxy pellet that goes in the ear of the cow, it absorbs in, and it's thousands of times stronger than estrogen, which causes that nice marbling of fat. So you can deal with that kind of a toxin and the mold side of zearalenone or the industrial side of concentrated zearalenone and your own natural estrogen production. It seems like it's a good supplement to take. I've been taking this stuff for years. And I would just say that there's multiple reasons you could consider that.

Neil:

Correct. Zearalenone is measured by the Great Plains test and it does mess with estrogen metabolism. And often when our patients are having what looks like a premature menopause we also... Michael Gray has observed that it's extremely common in women who have endometriosis, and it may be one of those things that contribute to that condition that hasn't really been recognized so far.

Dave:

I feel like we could go on for hours and hours more because you have just a wealth of knowledge about this. And we're both in an upcoming Toxic Mold Summit, I'll put links to that in the show notes, which is really cool. And I would just encourage people, if you're dealing with any of the things we just talked about, I've had... Nick Foles came on, his wife Tori Foles has POTS, and he was very open about that. And we've had so many people on, including doctors like Dr. Hyman, who's been on the show, who had toxic mold in his house. I talked to him, "I think there's mold. I think there's mold," and there was. And so we've talked about that in one of the recent episodes as well. So it hits people. I've Wall Street bankers, teachers, it's people from all walks of life who can get mold from their house, from their environment, and then it gets worse and worse.

Dave:

Then there's the Lyme disease crowd. Some of them have Lyme, some of them have mold. So I think if you look around right now and you say, "Okay. Do I have any of this stuff?" Maybe some people come to Bulletproof because they want to get better. And there's other people who come to Bulletproof because they're already awesome and they want to get even better. And depending on which one of those you are, if you're that, "I'm on top of the world," look around and find that person who's struggling in your life. And the odds of some of this stuff going on in there that's a biological cause of struggle rather than other just a weak person, the odds are high. And that's when a book like this is worth paying attention to.

Neil:

Thank you. So let me encourage all your listeners. If this is of any interest to you at all, read my book, it's called Toxic: Heal Your Body from Mold Toxicity, Lyme Disease, Multiple Chemical Sensitivities, and other Chronic Environmental Exposures. I wrote it so that it would be helpful. It has helped already thousands of people to understand what they have and to understand how to get the medical care, and that's the spirit in which I would encourage you to look into it further, because I hope I'm told that it is a pretty clear way of understanding this bigger picture, so you can begin to understand how to approach this.

Dave:

Thanks again for your work Dr. Nathan.

Neil:

You're very welcome.

Dave:

If you liked today's episode, seriously read the book. If not, you might want to go check out moldymovie.com. It is free. You can do that and read the book at the same time. I recommend both. Because if this sounds like a heap of crap to you, okay, you just heard from an expert who really knows what he's talking about, I've been talking about this for years, and there's a massive community of people who have figured this out, but there's many, many millions of more people who don't know which if any of these are affecting them. And even if you don't have these strong symptoms, trust me, you don't want aflatoxin floating around in your house. Why? Because it's the number one cause of cancer. Actually it may not be the number one cause of cancer, it's the most cancer-causing substance we know of. It doesn't mean it's the number one cause. Different math. So this just matters to all of us. And if you want healthy kids and you want reasonable healthcare costs, we got to solve this problem as a world.