Exposome In Chronic Complex Illnesses

Nafysa Parpia, N.D. interviewing
Mark Su, MD, FAAFP

Nafysa Parpia, N.D.
Welcome to this episode of the "Mycotoxin and Chronic Illness Summit". I'm so happy to have with me today, Dr. Mark Su, he's a board certified family medicine physician. He's been in full-time clinical practice for 18 years, he's at Boston. Mark, I'll let you introduce yourself to our audience.

Mark Su, MD, FAAFP
All right. Well, yeah, happy to be here. Kind of fun to have this chat with you.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
Yeah. So what should I comment? I'm board certified in family medicine, I guess part of my, thinking background, maybe important to say that my parents both immigrated from Asia. So while I'm conventionally trained and my dad was actually a researcher for a pharmaceutical company. My origins are pretty holistic as my dad is. I always think about my dad doing research in the den of our house at night, doing

research on pharmaceutical work, but with an acupuncture needle in his hand because he's used to get headaches.

Nafysa Parpia, N.D.
Wow.

Mark Su, MD, FAAFP
And they talked about nutrition a lot. I was a kid, so I didn't really believe them, but they talked about nutrition a lot and I was always like, well, how do you know that? Oh, that's what we always learn. I was like, well, okay, that's not good enough for me, but. Pretty interesting, kind of a broad spectrum background.

Nafysa Parpia, N.D.
Yeah, so your interest in what's biochemical and also what's holistic started from when you were a young age just at home. I love it.

Mark Su, MD, FAAFP
Yeah, I think I'm just generally an inquisitive person. I ask way too many questions for, my monkey brain's always going asking questions. But I think it was just cool looking back that I had those influences, that I think my parents, my dad especially just very reflective and inquisitive in general, but from the health medicine science background, it wasn't a one shot deal, a one-angled, blinders-on kind of approach, even though he was in pharmaceutical research and even though I was in conventional medical school training and such, so it's kind of a cool background. I appreciate it.

Nafysa Parpia, N.D.
Yeah, definitely. It shows in the way you think, when I hear you speak at our ISEAI board meetings, I can tell you, you've got both angles so grounded in both and I love it.

Mark Su, MD, FAAFP
Yeah, if you can fix that for me, anytime in my life I'd really appreciate that.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
Just turn this off a little bit, turn it down at least a little bit.

Nafysa Parpia, N.D.
I know. So let's talk about the exposome in complex chronic illness.

Mark Su, MD, FAAFP
Sure.

Nafysa Parpia, N.D.
If you can define for our audience the difference between the exosome and what's inside of the system.

Mark Su, MD, FAAFP
Yeah, most people probably in the late public, haven't heard the term exposome. A lot of people in clinical practice don't use that word much at all either, but certainly in research it's used. And I think in deeper functional medicine levels, a lot of people are familiar with it. So, the way I talk about with patients is believe it or not I sometimes do bring up that term, it depends on who it is.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
But I say, hey, look, everyone's heard the word genome, right? That's like the study or discussion of all things, genetic, everyone's heard the term microbiome. So these are all 'omes, right? Microbiome, the study in discussion of all things to do with the microbial environment in our gut. So exposome, as you can kind of then translate it's the study or discussion of all things to do with exposures. Right, so in essence is

another word for environmental exposures. And so I'm selective about when I might use that term, but it's a really encompassing term and I think it's gonna be used more and more. I know, for example, I was at a conference in October with Jeff Bland, godfather of functional medicine at his Personalized Medicine Life Institute. I think it's called PMLI, had a conference about it in October, mostly to do with gut health matters. But yeah, he talked about exposome an awful lot and we have pointed to a lot of research articles talking about it. So ultimately it's about environmental exposures and the trick there is, if you'd asked me 10 years ago, 12 years ago, what are we talking about? I might have been thinking about things that, you've dealt with a lot more there in California than certainly we deal within the east coast, fires, right? Forest fires and obviously people think about pollution and cigarette smoking and stuff like that, but there's so much more in the exposome it's impossible to even start to get your arms wrapped around as to what we're talking about, when we talk about the dearth and breadth of the exposome. And then when we start thinking that even the exposome we carry around in our gut is part of the exposome 'cause we think it's easy, for me at least. And I think a lot of people to think about stuff outside of our body, but what's inside our body and the gut is also not really part of our body, really. So that's actually part of the exposome too. It's a pretty broad term.

Nafysa Parpia, N.D.
Yeah, it's an interesting concept, a difficult one for people to grasp, even to think that these bugs that are in inside our body are actually not inside our body because they're yeah not in our cellular matter.

Mark Su, MD, FAAFP
Yeah, they're not made of ourselves, right? Anything basically for me, it's like anything that is not made from us. And I think you alluded to, when you said bugs, it reminded me that a lot of us, you and I and a lot of our colleagues, we'll use the phrase like bugs and toxins. Bugs and toxins.

Nafysa Parpia, N.D.
Let's elaborate more about that. So I'll just stop and tell our audience a little bit about bugs and toxins. So when we're talking about bugs, we're talking about all kinds of

infections, parasites, mold, bacteria, viruses, we're talking about toxicants, we're talking about a whole plethora of them. They could range from heavy metals like mercury, lead, arsenic, aluminum, cadmium and more and different chemical compounds. Percolate, PCBs, different chemicals, solvents, insecticides, fungicides. So those are all part of what we're considering as the exposome. Mark, tell us more about what else you would consider the exposome.

Mark Su, MD, FAAFP
Well, for me, I try to think in categories so I can keep mental sanity around the plethora of information, on multiple levels in life, especially work. But a lot of things you brought up are great. Those are very common and great examples. For me, I think one of the important things to think about first of all, so in the context of this summit, in the context of this topic, whatnot, there's an important piece to talk about. There's an important delineation to make between acute and chronic either conditions or inflammation, right? Acute and chronic inflammation, acute and chronic conditions. So, you'll find if I get a sunburn as an acute exposome, trigger, all right, that's fine. But I don't really need to get into the depths of what we're starting to get into, what the Summit's about. So when we're talking about chronic inflammation leading to chronic conditions, then we can knock out a lot of acute exposome triggers, right? Like a sunburn, it may trigger some people who have chronic conditions, but that's not so much what we're absolutely talking about, right? We're talking about things that people either have chronic persistent recurrent exposures to, which might be external to our physical body, or they might be harbored inside our body in whether it's gut or elsewhere, but it's not belonging to us, that's the bottom line.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So for me, I think about several subcategories of exposome. So one that you already talked about there is microbes, right? So bugs. So this could be as you said, I think of bacteria, parasite, not in rank order, but bacteria, parasites, fungi, which covers mold

and yeast. Why am I blinking? Well, actually, if you think about the bacteria, fungi, parasites, actually, I guess the reason I think about as more than those three is they're largely the big three families in I think about microbial types. But I think of things like tick-borne disease as a separate topic, because number one, it can encompass various pathogens or bugs from those three categories, as well as the fact there's certain subtopics in this exposome that sort of warrant thinking about independently because they really play a big role in people who have chronic conditions, right? So you got the microbial stuff. Sorry, go ahead.

Nafysa Parpia, N.D.
Oh, I would absolutely agree with you.

Mark Su, MD, FAAFP
Oh, yeah.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
Good, glad we're on the same page there.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
Yes, so we got the microbes, right? You alluded to what I'd call non-biologic toxins, non-biotoxins like the heavy metals. And then I think of biotoxins. So mold toxins, the mycotoxins, which is a huge piece of what the Summit's about. And then we've got sort of like, in my mind, I sometimes think of it as a miscellaneous category but we've got EMFs. There's such a variety of other pieces, but for me there's five big topics, five big subtopics I think about that go within the exposome. And then within all those five subtopics, there's so many further divisions and delineations and the bottom line is most people in conventional medicine experience are not aware of all the tools

that we have in our toolbox to be able to assess those problems. That's the real problem, right? And that's the real point for me in having sort of a chart or a checklist of thinking about what are all the things that we could look at and what are those things, has this patient already been looked at or looked at accurately, and if they haven't, then I don't wanna miss opportunity on some of those, especially the bigger dog topics, that can play a bigger role than others.

Nafysa Parpia, N.D.
Right, so it sounds like you're casting a wide net when you're testing, I know I am.

Mark Su, MD, FAAFP
Yeah.

Nafysa Parpia, N.D.
In medical school we're taught, don't overtest. And when it's patients who have an acute issue sitting in front of us, of course, we're not gonna do that 'cause it's just gonna lead to results which could often be meaningless or not the right time to go into that. But when we talk about a patient with complex chronic illness, there's so many different factors like you just talked about, Mark, and they all play off of each other. And so we have at our disposal, all kinds of labs. So when I say play off each other, I'm thinking about how molds, fungi sequester metals a lot, parasites sequester metals. Maybe they sequester other toxicants as well, I haven't seen any research on that, but maybe that's going on, I don't know. But I know that there's so much connection in all of these different pieces of the exposome within our body. And so we have this testing in our disposal. And so I do cast a wide net because in most of my patients, I'm finding that they have a plethora of infections, intoxicants, and I know that's the same for you. Tell me, Mark, how you decide where you're gonna go first, when you find all these layers of issues with the patient, how do you decide, what am I gonna treat first?

Mark Su, MD, FAAFP
Yeah, you're thinking about or you're talking about, oh, okay, for treating. All right, so I think that's a key point you just mentioned is casting a net, so for me, and I think it

sounds like we're very similar in that regard. Look, we both know and let's just state it for the record. It's impossible to identify all the different exposome problems that we may harbor, right? I tell patients all the time, look, we are all reservoirs of bugs and toxins. That's just the nature of the beast, you can't get away from it, we can't live in a bubble and we're not designed to, it's not the intention of life to be segregated or separated from our environment.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So we are all reservoirs and of bugs and toxins and that's just gonna get greater, we're gonna become greater and greater reservoirs as we get older, just by the function of time, right? 'Cause we're gonna be constantly exposed and so we're gonna accumulate more and more toxins over time. And so it's impossible to test for all those things. And not all things are warranting testing as far as we know, right? So then when we cast that net, that's a big part of constantly learning and networking for us is what's on the horizon? What's evolving as a concern, what is being seen and rising as threats of awareness and or new threats, as exposome subtopics. So for me, once I have a wide enough, let's call it, a wide enough map on what the exposome profile consists of for that individual. Then we're moving to your question, okay, now that we have all these different pieces, then how do we decide where to start, right? How to sequence it out. And that's a huge dilemma and discussion for all kinds of practitioners. And I don't know that there is a right answer there, right? I don't know if there ever is a right answer.

Nafysa Parpia, N.D.
I agree

Mark Su, MD, FAAFP
Right, yeah, I mean, that's like the holy grail, right?

Nafysa Parpia, N.D.
It is.

Mark Su, MD, FAAFP
And I don't know if that'll ever be solved. To me, that's almost like solving the purpose of life or something.

Nafysa Parpia, N.D.
I agree, yeah.

Mark Su, MD, FAAFP
There's way too many configurations, way too many variables. We'd need a mega mega computer on steroids for exponential fold, it's just way to complicated.

Nafysa Parpia, N.D.
And for each individual person, right? Because what might be a variable in you could have a different effect in me.

Mark Su, MD, FAAFP
Yeah, absolutely.

Nafysa Parpia, N.D.
So different variables and different people and they play different notes, this is highly personalized.

Mark Su, MD, FAAFP
Right, so putting all that together is like extremely difficult. So for me, and I think we're all the same. There's no cookie cutter, right? For sure. There's no template, but the way I think about it is, and I know not everybody's a sports fan. So I don't mean to go off on that. But, I think about it for myself as Phil Jackson's Chicago Bulls during the Michael Jordan era, they had this system, an offensive system they called the triangle. And the thing about it was you couldn't run this with any team, because you

had to have people on the team who were basically smart enough to kind of figure it out.

Nafysa Parpia, N.D.
Okay.

Mark Su, MD, FAAFP
Because it's not a cookie cutter template. It's not just, here's the play and this is what you do, this is what you do, and this is exactly how it's gonna go. No, it's a flow chart. So the triangle's offense was, we're gonna have these three people set up in this area, in this space as a triangle, and then we're gonna start out this way. But depending on what the defense does to us, then we have to read and react and then we create a play off of it. So you gotta have smart enough players to know what the defense is doing, and then be able to communicate with each other to say, okay, this is how we're gonna do it. And then they get used to each other and create chemistry, et cetera, right?

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So as evidence by Phil Jackson trying to take that to other teams subsequently it didn't work out so well with subsequent teams.

Nafysa Parpia, N.D.
Interesting.

Mark Su, MD, FAAFP
I think of it like that, it's a flow chart. So there may not be a cookie cutter template, but there's a sort of baseline foundational approach as a starting. I don't love the word algorithm, but something along those lines. And then the first question for me, well, the first few decision making points are based on patient specifics that are kind of like non-medical if you will. So for me, these are big on decision making. Number

one, how severe is the person's symptoms and that usually correlates directly with how urgent do they feel they want to address their problems. Number two, is what's their philosophy or bent on pharma versus non-pharma. And then number three is their financial situation.

Nafysa Parpia, N.D.
Those are three really important ones. Absolutely, when you're sitting with the human in front of you, they're gonna have a variety of different answers for all those three, those three go through my mind too.

Mark Su, MD, FAAFP
Yeah, they're huge because if someone says, I am desperate and I'm in a corner and don't worry about the money part, with cost of testing or treatment or whatever, just give it to me all at once, I'll do it all yesterday.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
We're not gonna do all it all yesterday, but then I'm gonna start from that end on creating a regimen.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
And then if they can all the more, tell me, I'm all like, don't talk about pharma. Great, I don't have to think about those, right? Or if they they're saying I'm open to both or cost wise, if we're gonna be racking up a bunch of things, then I wanna use my copays, they're gonna be cheaper. So let's talk about pharma, whatever.

Nafysa Parpia, N.D.
Exactly,

Mark Su, MD, FAAFP
Because there's too many variables again. So creating the decision making, those three things are top three for me. And then I think the next topic is the clinical topics, right? So as we just said and I think everyone who participates in this summit, people we know as colleagues would agree, there are certain topics that are sort of like big dogs and others that I consider are sort of more peripheral. It's not always the case, but generally speaking, it's gonna be the case, it seems. I think it's largely based on clinical experience, right? With a lot of practitioners, as well as just scientific concept on how much these particular subtopics within the exposome can really impact mitochondria and impact the immune system and et cetera, et cetera, how much they can become systemic versus just focal to a certain part of the body once there's some exposure. And of course, another big part about that with the clinical topics is some pieces might seem like they're bigger dogs than I would've initially assumed with that with any given person. But it's based on that person's clinical experience to date having prior to me seeing them, if that's the case. The nature of the summit, mycotoxins, you guys picked that topic of course, because it is a major topic and practitioners who know about it are seemingly in universal agreement that it's a big dog topic, right?

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
And then lastly, for me, it's also very much about the patient's preferences, what resonates with them. So it's a massive amount of information to collect, to take in, to interpret and then create a sort of map and game plan. I like to use the word map and that term, that concept. But once I throw out some kind of option, game plan for the patient then more often than not, they have some kind of resonance about some topic or another, right? You and I have come across a lot of patients who we're talking about mold and mycotoxins with good reason based on lab testing and they just can't buy it. They're like, my house is only seven years old. I don't see anything, it feels clean, it smells clean, no one's ever talked about it. Everyone else in my family's

fine. How could that really to be. Hey, I might be totally convinced that's the number one topic and have all the data to suggest it, but if the patient's just not gonna agree to it, then, okay, well, you can only lead the horse to the water. And so let's move on to other topics and keep talking about it and maybe we'll come back around to dealing with it later.

Nafysa Parpia, N.D.
That's such a fascinating discussion for me because in this summit I haven't talked to a doctor yet where we've talked about what goes on in the room with the patient and what goes on in the room in our minds when we're talking with the patient. So thank you for going there, it's just awesome.

Mark Su, MD, FAAFP
That's fun stuff, for me, that's what I love about what we do, as clinicians is just the connection with the patients.

Nafysa Parpia, N.D.
Yeah, exactly.

Mark Su, MD, FAAFP
I like to believe I still have just as much fun, and fulfillment, I should say, connecting with patients just about regular conventional topics, 'cause here we do both primary care and consulting, but when it comes to more challenging stuff, it just takes a lot more brain activity and a lot more gymnastics up there to kind of sort out the decision making with patients, but they really appreciate that.

Nafysa Parpia, N.D.
They do, and then when they get involved in that decision making process is huge.

Mark Su, MD, FAAFP
Yeah.

Nafysa Parpia, N.D.
Instead of saying, okay, here, I'm gonna do this for you, but because there's so many variables, we have to go through each of them, each of the tests and you're so right the finances, the lab testing alone can be $3,000 to 5,000 or more, depending on what you're testing the first time you see a patient 'cause none of this is covered by insurance or the large majority isn't. So that really plays in and that also plays into diagnostics and then decision making. So there's a lot.

Mark Su, MD, FAAFP
Yeah, and as you and I both know it's essential, especially on these bigger stake topics where it's chronic and it can be expensive and such that there is buy-in, otherwise, just the practitioner patient synergy and energy, resonance is going to be a therapeutic factor for the patient itself.

Nafysa Parpia, N.D.
Yes.

Mark Su, MD, FAAFP
Yeah, I can't understate that topic so glad you pointed that out.

Nafysa Parpia, N.D.
Yeah, thank you. I'm really loving this discussion Mark.

Mark Su, MD, FAAFP
Yeah, it's fun stuff.

Nafysa Parpia, N.D.
Yeah, okay, if you're trying to account for so many different parts of the puzzle with any given patient, how do you know what treatment direction to take then?

Mark Su, MD, FAAFP
Again, there might be an upfront flow chart, starting point for me. And I think most people are, like you said, most of us would agree that the mold, toxin topic is gonna be near the front. You brought up the parasite topic earlier, right? That's a fast growing topic for me. So speaking on that, just you were asked, you were talking about parasites being reservoirs of heavy metals. And I was just educated last fall at a conference about parasites being in data shown to be reservoirs of at least Barilla lime, as well as yeast, I'm on the hunt to see if there is data about parasites being reservoirs of mold, organisms or mycotoxins, I don't know that it's out there. I think there's been some discussion or there's been comment to me that Dr. Klinghardt, has purported that, but I don't think it's published information, so I don't have details about it, but back to exposure exposomes, I could be re-currently exposed to mycotoxins outside my physical body, or I could also be re currently exposed to aurelia through a parasite in my body.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So that's a whole nother game changer for me when I'm talking to patients and they're saying I haven't gotten any new tick bites, not any that I know of, and I'm super vigilant about checking myself 'cause I know that I may not feel it, et cetera, et cetera. And then now I'm suddenly going, oh wait, maybe you don't even need a tick bite and maybe that's why this is out of factor and why there's a recurring exposure? That's a game changer.

Nafysa Parpia, N.D.
And not only that, when you're killing a parasite, when you have a patient in anti-parasitic protocol, you have to consider that that parasite can be dumping lime. It can then be exposing the lime as you kill the parasite or exposing the metals or the funguses that it's sequestered as you're killing it. So every time we're killing any infection we have to think about, oh, why is it that another infection comes bubbling

up to the surface? I think I'd take care of one and I do, but, oh, here comes another infection or here your metal loads are higher now, so we've gotta mop that up so there's so much going on simultaneously.

Mark Su, MD, FAAFP
So beyond what we talked about just a few minutes ago with bigger targets, big dogs versus peripheral topics and patient preferences and resonance and making a little pit stop talk point on the parasite matter.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
I think most everyone in the ISEAI organization that we're on board with together, are very aware of the mass cell topic. So that becomes a huge sequence topic.

Nafysa Parpia, N.D.
Mark, will you tell our audience what ISEAI is?

Mark Su, MD, FAAFP
Oh, sorry. So, International Society for Environmentally Acquired Illness.

Nafysa Parpia, N.D.
And so Mark is the vice president and I'm on the board of directors there.

Mark Su, MD, FAAFP
Yeah, so it's an organization geared towards helping educate practitioners as well as create awareness and helping lead patients, or point patients in the right direction at least, with education awareness information. But as the term there, Environmentally Acquired Illness sorta describes for itself, it's about the exposome. It's about all these potential environmental exposures that lead to a secondary or acquired illness.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
And so mass cell topics, thanks to the founders, including current board member, Mary Ackerley, have made mass cell activation syndrome or mass cell disorders, a major topic because a lot of people who have these chronic complex conditions have a mass cell disorder of some sort. And so it becomes very difficult to treat whatever those root cause issues are within the exposome until they at least have some manageable control over the mass cell disorder in order to tolerate treatments for those root 'cause problems. So there becomes a big sequential topic.

Nafysa Parpia, N.D.
Right, so it's like we've got these secondary issues, and how many patients? There's your secondary issues here. They say, well, I have a mass cell. So if you just treat my infections, won't it go away. Yes and no. And this is where it gets a little sticky, right? We would wanna calm down the secondary infection 'cause over here is the driver. and if I start to treat the driver first, and I can, and sometimes I do, I pull out the inciting event, but your immune system has already set itself up to be stuck in a loop. So sometimes remove the inciting event, but the inflammation continues, the immune dysregulation continues. So what we've learned in more recent years is that we do wanna work on the secondary issues, keep at bay as much as we can while we're treating the infections, because as we treat the infections or the toxins, they're gonna be insults again to the mass cells, like we talked about earlier or where we're dumping metals or we're dumping fungi as we treat, it's gonna insult the mass cells to flare again. So calming it down-.

Mark Su, MD, FAAFP
Right, exactly, it could be a back and forth. And so there can be that dance that can be kind of difficult.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
And I think the other really common sequential topic that we all come across, who deal with the mycotoxin illnesses is a lot of the mold toxin binders 'cause a lot of constipation.

Nafysa Parpia, N.D.
Yes.

Mark Su, MD, FAAFP
And so if a person's got, SIBO, small intentional bacteria overgrowth, which I also personally think of as a secondary problem. It's usually a root problem in conventional terms, but it's caused by other root problems. So I think of it as a secondary root problem.

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
But so just as you said, you could hope and expect the SIBO condition to improve as dealing with the root causes, but you may not be or oftentimes we can't get the root problem addressed in this case, mycotoxins, because the treatment for it, the mold binders are worsening constipation resulting from the SIBO itself. So you kinda have to take a step back, and do a sort of preview or sort of like the forward to chapter one before we can start chapter one.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So there's a few little nuanced situations like that and yeah, there might be others, but those are two really common ones, of course.

Nafysa Parpia, N.D.
Yeah, and we encounter them every day with every complex patient I'd say. Yeah. So how do you keep track of your information? Is it in your chart notes? Are you literally making a flow chart?

Mark Su, MD, FAAFP
Yeah, so for me, because this monkey brain up here likes to try to be comprehensive about all this stuff. For my own sanity, that's why I use the word map because I think of it and literally to me is a map. So I've created a map system for myself, for my patients initially just for my own sanity. And then I've since shared it with people and practitioners in my office. And actually, I shared as a poster at the IFM conference in the spring and was unexpectedly and humbly, what's that?

Nafysa Parpia, N.D.
Would you be willing to share that poster with our audience?

Mark Su, MD, FAAFP
Yeah, sure. It was the first time I've submitted anything to a conference for a poster. Maybe anything, I don't remember since I my residency days and I don't say this so much for bragging rights, but more so that apparently it's well received and resonates with practitioners because I received the attendee choice poster session award three weeks later after the conference. I was like, wow, I didn't know it was coming, I just see a box come in. I'm like, wow, I'm kind of flattered. But the point is, for me, I was just kind of curious as to how it resonates with people in general as a poster, but there's so many stinking posters, but apparently there's enough resonance with other practitioners, it makes sense. When I talk about with patients for their sake, for their data and just conceptually, understanding self, non-self, or exposome, environmental exposures and that regulation of the two, right? Largely

gut health, it just makes a lot of sense for patients. And at that high level, it's easy to start then delving into specific subtopics. But for me to be able to keep to track of, as you and I know, we could pick any one topic, let's stay on the mycotoxin topic, that's the point of the summit, the large focus point. As you and I know, the whole, even just taking the traditional service protocol, or if we wanna talk about the more brutal protocol, whatever, a lot of these protocols have so many steps to them, right? Or patients take a decent amount of time to work through and see how they respond, et cetera, et cetera, right? Well, what happens over two months, much less six months, much less nine months if they're also working through their environment and all that stuff, right?

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
And you come back to trying to touch base with what you were talking about nine months ago. Help me, excuse me, I don't need to go back to my chart, rewind the whole note and all that. So for me, creating this map has helped me click off. Okay, what have I already checked off on? What were the results on those topics? How does that, okay, so when I go back to it, wait, did we look at Lyme, really? Did we treat that aggressively? How long did we treat that for? Was it only two or three months? Did they have like a side effect to that? And that's why we didn't really do it or was it, oh, no, we treated it presumptively based on blah, blah, blah. They were treated with a previous practitioner, but no, it's only for three months. Maybe it really wasn't long enough. I mean, it's nuts, right? But this map really, really helps me zoom in to the given topic we're working on now or the last three months or whatever, and then be able to zoom back out, right? And say, oh, okay, now I can remember these other pieces of the puzzle.

Nafysa Parpia, N.D.
I've gotta see this map, Mark.

Mark Su, MD, FAAFP
Yeah, I think that poster with the video talk I put with it, I will forewarn you that as a reflection of my monkey brain, it's much longer than I expected it, I wanted it to be initially. But yeah, I can give you the link for that.

Nafysa Parpia, N.D.
Thank you.

Mark Su, MD, FAAFP
Yeah, so now we're converting it into an app. So for patients or mostly for me, some of the practitioners are in an office and stuff, so we're converting that to an app forthcoming. So it'll be great.

Nafysa Parpia, N.D.
We need that app, Mark. We all need that app.

Mark Su, MD, FAAFP
Yeah, I'm looking forward to it. 'Cause right now it's like a lot of it it's just on paper for me right now. We have our EMR, but because the EMR can't handle all that stuff, it's for us is we have our own paper map for each individual patient.

Nafysa Parpia, N.D.
Yeah, so when is this app supposed to come out.

Mark Su, MD, FAAFP
There's already a beta version. And so we're actually testing it out and how it's working out with people as we speak. So could be, I don't know, could be really, really soon.

Nafysa Parpia, N.D.
That's really, really exciting.

Mark Su, MD, FAAFP
Yeah, again, a lot of it is just organization, right? And a lot of it is helping us maintain the whole picture and being able to, again, zoom in at times and zoom back out without having to rewind the whole story and fumble through our notes for the last year or whatever.

Nafysa Parpia, N.D.
Right, that's fantastic.

Mark Su, MD, FAAFP
Yeah.

Nafysa Parpia, N.D.
And so one thing I really don't know much about you at all is that you derive a lot of your thinking from your wife's work as a researcher.

Mark Su, MD, FAAFP
Yeah, so how so.

Nafysa Parpia, N.D.
Tell me about your wife's work as a researcher and how that influences your thought process.

Mark Su, MD, FAAFP
Yeah, it's really actually pretty fascinating stuff, it's kind of humorous too. We were actually talking about this with some friends socially, yesterday, and it sounds geeky and whatnot, but she was like, yeah, during early COVID, date night at the Su's, Mark and Jessica are sitting on the couch watching this 30 minute lecture on the immune system from Sam Yunuk. She didn't know who Dr. Yanuk was but for me, I was like, you gotta see this, 'cause she was asking me as a researcher, can you explain blah, blah, blah, blah, clinically? And I was like, well, I knew this from this lecture, let's just watch it again together again so I can refresh it. So she's a metabolomics, right? So back to the metabolome. So we talked about the exposome, the genome, the

microbiome, the exposome now the metabolome. So what's that, that's the study and discussion of all things that are basically metabolic markers. It's kind of a generic term to me, it means a lot of stuff. But the way I describe it to patients is they have these super computers that are sometimes higher functioning. A lot of times, higher functioning, and even government computers, they basically take mounds of data and just throw it up on the wall and through these crazy computer calculations and algorithms make connections and connect dots to make sense of what is a common pattern for given patients to either diagnose or assess their status of treatment, et cetera, for some condition. So the example I often give patients is this, they've got one study and I don't have this exactly right.

So forgive me for that. But this is the way I present it. They even have printed published a study where I think it's 18 to 23 or 24 year old boys from Mexico, not just Mexico, but a specific province of Mexico. If they have a specific gene and they are vitamin D deficient as defined as below a certain level and they have an environmental trigger of I don't remember what type. At that age range, it turns on and upregulates that gene such that because of the vitamin D deficiencies role in it, they become massively obese fast. I mean really fast. And there's basically no way to turn that off, unless you address first, the vitamin D topic and then you take other steps. How many times do we think about where we hear patients say, well, does it really matter if I quit smoking, or anybody, my brother won't stop smoking. My brother keeps saying, well, uncle Charlie smoked forever, two packs a day for 30 years. and they never got lung cancer, right?

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
And how come other people who don't smoke get lung cancer or people who only smoke like two cigarettes a day get lung cancer. It's so much more complex.

Nafysa Parpia, N.D.
So much more.

Mark Su, MD, FAAFP
So she's at Harvard Medical School with Brigham and Women's Hospital and she is, I will dare say, I really don't like bragging self-promoting, but I will brag about her. She's, I would think like top five, top three in the world, she's currently the president of the International and Metabolimics Society. She's doing research with people who are literally top of the world, top of their industry with metabolomics. And the cool thing is they find stuff that is very functional medicine oriented, right? The more she learns about functional medicine, the more she gets excited because she's like, wow, that's like what we're doing. I go to a conference. It was the 2018 Institute of Functional Medicine Conference on the auto-immunity, the connection between guts, genetics and the environment, something like that. And she's gone, and let me look at the speaker list. She goes, oh the guy, the top speaker Alessio Fasano , I've got grants with him. He's the guy who basically founded the whole topic of gluten and zonulin and test of probability.

She's like, oh, we were doing this research grant with these people at John's Hopkins about the microbiome we're studying, how does a microbiome from affected by the mother lead to issues, with the babies, both in utero and then in the first year, two and three years of life, and what is a risk for developing allergies, asthma, blah, blah, blah, blah, blah, right? So when we talk about the GI effects stool test, right? The GI-MAP or whatever test and she looks at the GI function, she's like, oh, that's just like the kind of test that we are studying. But then the frustrating part is, as you know, I bantered about just prior to recording this call, that research is going on here in the heart of Boston with this high and mighty ivory tower thing. And then you've got those of us doing this functional medicine on the clinical side that side of the spectrum, but that band between those two entities is so huge and so vast and so seemingly impossible to bridge. It's a really hilariously frustrating, but entertaining to observe phenomenon that she and I have because she could literally, her and her group and the people they do work with, they could literally translate what they do into a total functional medicine world and advance functional medicine, light years very quickly. It's just, who's got the money, right? Where's the money coming from and who's got the interest and blah, blah, blah. So a lot of what she does is not just

about the findings it's about the thinking, because their thinking is so much more objective about, look, we're not going into this with a presumption of this outcome or that outcome, we're going into it with, let's just connect the dots. And then when they connect the dots, it's so much like this map, the illustration we often use in this organization that we're doing, we're creating now for patient care, this functional medicine consulting group it's all about this map. And you're trying to crack the code for this chronic inflammation problem that people have, right?

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
The code is not one topic. We can't silo it into just mycotoxins. It's not just tick-borne disease, it's not just parasites, right? As you and I have already talked about, it's a combination of stuff and everyone's combination is different.

Nafysa Parpia, N.D.
Right.

Mark Su, MD, FAAFP
So how do you find what that code is for each person that padlock like for the bike? It's not two digits or one digit, it's like 6, 9, 12 digits. And you could have every single digit except one, and it doesn't open, right?

Nafysa Parpia, N.D.
Exactly.

Mark Su, MD, FAAFP
So, you gotta cast a wide enough net to figure out what are the potential players. And because you and I know, if we don't find enough of at least the big dogs, we could be circling for months to years around some topic, because each topic is taught difficult enough that we could get stuck in there for endless amounts of time, with rational explanation why that's not-

Nafysa Parpia, N.D.
Yeah.

Mark Su, MD, FAAFP
But then only to find two years later, oh, we missed on this topic, right? So my mind is if the person's willing and able back to preference, back to financial piece and back to severity and urgency, if the person's willing to cast that wide net, it's so much more efficient. We don't have to do it all one time but if we can at least get the data upfront and create your map and know where we're headed, at least we can then create the map, start somewhere. Even if it's just one action point, but at least we know where our work's cut out for us. And it's gotta be more efficient than going, let's do this one thing because that's what I know best, and that's what I'm most familiar with, and that's what a lot of people talk about, and then a year later let's change direction randomly. It's not the way I think. The thinking behind what they do in that research with the metabolomics is it just really resonates with me. It's like what we're doing or a lot of us doing with this kind multifaceted piece, sometimes I call like multidimensional medicine it's like metabolomics except it's so much more raw on the clinical level because we don't have data to go on so we're doing the best we can in networking with each other to try to figure it out along the way on a fly.

Nafysa Parpia, N.D.
Right, wow. Mark, this has been just an awesome discussion. I've had so much fun and honestly, just enlightening patients about what goes on in our minds as their practitioners, that's gold, that's valuable. People don't get that very often. So just thank you, thank you for bringing that up. Mmh, hmm.

Mark Su, MD, FAAFP
That's fun stuff, and of course you and I both know the real fun is when people get better.

Nafysa Parpia, N.D.
Exactly, that's the best moment. And that's the time to celebrate when they turn that corner and you see it happening. Like, all right, now you're ready.

Mark Su, MD, FAAFP
Yeah.

Nafysa Parpia, N.D.
You're almost done, yeah. Is there anything else you wanna share, Mark?

Mark Su, MD, FAAFP
Nothing off the top of my head. I'm here for you, so whatever's on your mind.

Nafysa Parpia, N.D.
We've gone pretty deep, so thank you.

Mark Su, MD, FAAFP
Yeah, sure thing.

Nafysa Parpia, N.D.
I just wanna spend time hanging out with you and your wife, I know Eric will too . we could all geek together.

Mark Su, MD, FAAFP
Our chats are not all about that, we have four kids. We've got plenty of other things to try to figure out and try to plan around, but, yeah. We have some pretty fun talks. It can be very professionally exciting to talk between us, but anytime just tell us when we're having our zoom dinner date and let us know.

Nafysa Parpia, N.D.
Thank you, Mark.

Mark Su, MD, FAAFP
All right, thank you, it's fun.

Nafysa Parpia, N.D.
Thank you.