Dr. Drew Sinatra: Detoxification is as old as time. Many spiritual practices were all about cleansing the body.

Dr. Steve Sinatra: Now, more than ever, it's absolutely necessary. We live in a toxic world — it's almost impossible to avoid taking chemicals into your body.

Dr. Drew Sinatra: Today, we welcome back Dr. Deanna Minich, who has recently been named as the President of the American Nutrition Association's College of Nutrition.

Dr. Steve Sinatra: We'll be talking about the power of metabolic detoxification, how plastics are the next pandemic, and what you can actively do to lower the amount of toxins in the environment and in our bodies.

Narrator: Welcome to **Be HEALTHistic**, the podcast that's more than just health and wellness information — it's here to help you explore your options across traditional and natural medicine, so that you can make informed decisions for you and your family. This podcast illuminates the whole story about holistic health by providing access to the expertise of Drs. Steve and Drew Sinatra, who together have decades of integrative health experience. **Be HEALTHistic** is powered by our friends at Healthy Directions. Now, let's join our hosts.

Dr. Drew Sinatra: Hi, folks…if you like what you hear today, and you want to listen to future conversations on all things integrative and holistic health, subscribe to our podcast at **BeHealthisticPodcast.com**. Also, check out and subscribe to the Healthy Directions YouTube channel, which features video versions of our episodes, plus extra videos you won't want to miss. And finally, there's more with me, Dr. Drew Sinatra, my dad, Dr. Steve Sinatra, and other health experts at HealthyDirections.com.

Dr. Drew Sinatra: Welcome, everyone, to another episode of **Be HEALTHistic**. Today in the show, we're welcoming back a guest from Season Two, Dr. Deanna Minich — an internationally-recognized teacher, author, scientist, speaker, and artist who has more than 20 years of experience in the fields of nutrition and functional medicine. Her FACN and CNS credentials are associated with the ANA, the American Nutrition Association, who just announced that Dr. Minich has been named to the ANA Board of Directors and President. Yay!

Dr. Drew Sinatra: Now, last time we had Deanna, we talked about the importance of "eating the rainbow," and the healthy benefits of consuming phytonutrients, and the healing power of food. We also touched upon the concept of metabolic detoxification, which we really want to explore in greater detail with her today, so we've welcomed her back. Well, Deanna, welcome back to the show.

Dr. Deanna Minich: Hey, thanks for having me. You've got me on all the topics I love to speak on. So I'm glad that we covered off on the rainbow, and we're probably going to talk about that a little bit as it relates to detox — and I'm just completing teaching for The Institute for Functional Medicine module on environmental health. So all of this is still really fresh, a lot of the questions that people have are on my mind. So I'm excited to talk with both of you.

Dr. Drew Sinatra: Oh, that's fantastic, all right. Well, congratulations are in order for your new position now at the ANA. Yay.

Dr. Deanna Minich: Thank you.

Dr. Drew Sinatra: So can you tell our audience what that is, and why you chose to be a part of the board?

Dr. Deanna Minich: Yeah. I have to be very selective with my time because I'm doing many different things, and one of the things that I really do get behind and believe in as a mission is the American Nutrition Association, as Dr. Sinatra knows. I mean, you both know how important it is to really raise the bar on what people know about nutrition, and I feel that we need to come together as a united front and that's what the ANA is about — is bringing out the entire cornerstone of personalized nutrition, what does that mean? We're not so much just about dietary guidelines anymore, in terms of just public health. We need to start looking at this more critically and with a scientific eye.

Dr. Deanna Minich: So that's one of the things that the ANA is really good at. We came out with a position paper at the end of 2019 defining what personalized nutrition is, so I have great advocacy. Again, I have to be very selective about my time because I teach in various places, but I wanted to commit to this mission. So it's an honor for me to be of service in this way.

Dr. Drew Sinatra: Wonderful. So you're president of the American College of Nutrition, as well?

Dr. Deanna Minich: I am…and so the American College of Nutrition is actually part of the ANA. So it's kind of a family of organizations. And that's how I know Dr. Stephen Sinatra, is because he and I have been on the board of the ACN for some years now. So it's really great to be in good company.

Dr. Drew Sinatra: Well, today we're going to talking about metabolic detoxification, Deanna, and some other things, as well. But why don't we lead off with, what is metabolic detoxification, and why are you talking about it? Why are you bringing this up?

Dr. Deanna Minich: So if we just think about this very simply, what metabolic detoxification is, is how the body gets toxicants out. How do we eliminate things that do not need to be in the body? We don't want them in the body. So these are things like heavy metals and plastics, parabens, a whole gamut of different things that are out there. So for some people, they do that a little bit better than others. Some people will say to me, because I've written a book on detoxification, they'll say, "Well, but everybody detoxifies. We poop. We pee. We sweat."

Dr. Deanna Minich: But the thing is that we're not all doing it in equal measure, and some of us actually have genetic variance that make us not release these toxins very well. So then we start to get symptoms, and we wonder how we got those symptoms. So when I think of detoxification, as you had asked about, I think of five organ systems. I think of the gut, the liver, the skin, the lungs, and the kidneys. Those are the main ones. I know that I didn't mention the heart, but the heart is part of the circulation. I mean, really, we could talk about every organ of the body is geared towards properly eliminating what doesn't need to be there. But I see that those five organs are really the hub — and really starting with the gut. It's so important to be defecating on a daily basis, right, and to be doing that well, because otherwise, we can't release a lot of these things that we're taking in.

Dr. Steve Sinatra: Drew, I want to make a point here because detoxification is not really in the realm of the traditional, conventional MD. So I think our viewers have a really special program today. We have a PhD, an ND, and an MD — and I think between the three of us, we can really wrap our arms around detoxification. So, I mean, I'm delighted, Deanna, to have you here because again, detoxification should be talked about more and more. Unfortunately, it's not. Remember, the body needs to detoxify a lot of pharmaceutical drugs, which really can cause some harm, but we have to be careful. So let's get to it — phase one, phase two, and I'm sure you're the expert, so I'm anxious to hear what you have to say.

Dr. Deanna Minich: Well, I'd like to comment on what you just said. First of all, detoxification is as old as humankind. If we look at medical and spiritual practices over time, one of the first things that they were doing was cleansing and clearing and purging and fasting, right? That was just a part of a spiritual practice, it was part of medicine — whether you apply leaches, or you've got bilious humor in the body, there's something toxic in the body. We soon came to know those as pathogens.

Dr. Deanna Minich: Then we got into pharmacokinetics — what you just said about drugs, that's a really important point. Much of what we know about nutritional metabolic detoxification actually comes from the science of looking at pharmacokinetics, and looking at drug metabolism. In so doing, understanding all of these different enzymes in the body that are active when we take in things like a drug, and how

it's excreted so that it's not toxic. So now we've applied those principles to food. Like, we hear about it with grapefruit juice, changing the activity of certain drugs. Don't take your drugs with grapefruit juice, or green tea has... I mean, basically everything that we take in is going to change how we eliminate and detoxify.

Dr. Drew Sinatra: Well, Deanna, I should mention here, too — I'm wondering if this name, metabolic detoxification, is a great way to sort of move ahead now with talking about detoxification in the sense of what you are mentioning. Because a lot of doctors, a lot of MDs, would probably think of detoxification as, "Oh well, that's drug and alcohol detox." Right? That's sort of like their framework from where they're coming. But I know for us, as more functional medicine docs, we're thinking of detoxification in completely different terms. So I'm really starting to like this metabolic detoxification title a little bit more.

Dr. Deanna Minich: Here we are with an ND, an MD, and a PhD talking about detoxification, and the perception of detox is quite different out there. It means a lot of different things to different people. For some people, it's alcohol and drug detoxification. For other people, it's lemon juice and water. But the way that I came to know about metabolic detoxification is through my research with Dr. Jeffrey Bland. Dr. Bland is the father of functional medicine, as we endearingly referred to him. When I worked with him at The Functional Medicine Research Center, I got to understand a little bit more about the different nutrients that were impacting certain pathways, and how you can see symptoms in people — whether it's brain fog, or joint pain, or skin issues, gut issues — from not properly detoxifying.

Dr. Deanna Minich: So one of the clinical trials we did in that clinic was on people with fibromyalgia — who we know that that's a very complicated case, it's a very difficult condition because there can be many different root causes. So what we did is we had them on a food program. We put them on a powdered medical food, which we knew had agents to facilitate detoxification. And then we looked at their symptoms and their symptoms improved, and we published that work.

Dr. Deanna Minich: I mean, me as a scientist, I know about metabolic detoxification because it's in the science. It's just that, typically, it takes 30 to 50 years to translate that science over into standard of care in medicine. We don't see that. So I've published articles…in fact, one of the articles that we published was on nutrients for glutathione support. So that was one just came out not too long ago. We did another one in 2015, looking at all of the steps in detoxification, which we can talk about, and how nutrients change the activity of those individual enzyme systems.

Dr. Deanna Minich: So I've been writing on this, I teach at the university on this topic. So this is…I think it's coming out now, is not just detox, but it's the environment. We have a responsibility…we all do, as clinicians, as people on this planet, to be learning more about what these toxicants are doing. I mean, even the microplastics. You put a teabag in water, one of those fine plastic mesh teabags — there was a press release and a study showing that you're releasing something on the order of 11.6 million microplastics in a cup of tea.

Dr. Deanna Minich: So I think plastics are the next pandemic. Plastics are everywhere, and they're endocrine disruptors, they're changing our hormones. Which means that we're changing everything, when you start changing the endocrine system.

Dr. Steve Sinatra: Deanna, you're absolutely right. I remember Drew and I went to a conference a year and a half ago in Arizona, and we're talking about BPA, bisphenol A, being a major endocrine disruptor — causing premature births, and I mean, it was horrendous. So now, you can pick up foods that have "BPA-free" right on the label, because I think that's a major endocrine disruptor. And people need to be privy to this information because they have no idea how many toxins are in the food supply — whether it's heavy metals, or insecticides, or pesticides, and now BPA. I mean, the list goes on and on.

Dr. Deanna Minich: Yes, and I'm glad that you bring that up because I want your audience to be informed that BPA-free does not mean BP free, bisphenol.

Dr. Steve Sinatra: Right, right, yeah.

Dr. Deanna Minich: In many cases, the BPA is being replaced with even more toxic offenders. I know it's really hard to avoid these plastics, right? I mean, goodness. I mean, I try my hardest when I'm at the grocery store to make selections. But I even see produce in plastic bins. I mean, we need to somehow create an awareness about plastic, because again, like you're saying, Dr. Sinatra, it's so true. We are seeing the effects of these plastics, and it's for the coming generations. For all the kids to come, starting to see endocrine disruption, seeing puberty happen earlier, seeing infertility issues, seeing menopause happening earlier — this is really affecting us. I don't think we realized the profundity of this.

Dr. Drew Sinatra: Well, the whole concept of detoxification is really abstract for people, because they can't see any of these toxins. They can't smell them, they can't feel them coming in. So we need to research these things, and learn about the microplastics, and the BPA, and the heavy metals, and the pesticides, and all the different air pollutants that we're exposed to. I think people…if it's not in front of them, they don't think that it's really there or it's necessarily a problem. And there's a level of trust that's there, too, of well, if I'm buying something, it's got

to be good for me. It must not have any chemicals in it that could affect my body. But that's certainly not the case at all, I mean, there's so many things on the shelves out there that are toxic in so many ways.

Dr. Deanna Minich: So let's go through some ideas. What I'd like to do is usually when I'm teaching with individuals and groups, I like to focus on food, water, and air because those are the points of entry for these toxicants. So maybe we can give the audience some ideas, and I'll talk about detoxification processes as we go. I think the biggest one is food. So we've already mentioned BPA. So when we think of food, this is something that's within our control, to some degree, right? So many times people won't change what they're eating, but they might change how they are cooking it.

Dr. Deanna Minich: So one of the biggest offenders in food is the cookware, how we're cooking it. And some people are overcooking, and then they get the production of a lot of these carcinogens. And many times the pans that we're cooking in, they have aluminum, they have Teflon. Teflon, especially, this is a perfluorinated compound that does not eliminate from the body very readily, it stays in the body over a long time. So I think even focusing on cookware — focusing on glass, stainless steel, having ceramic, titanium-plated type of cookware I think is really important. And not cooking too high on heat…slow, low, moist methods of cooking, rather than dry, hot heat is important.

Dr. Deanna Minich: Even oils. My PhD was in essential fatty acids, and one of the things that I see as a toxic offender in the kitchen is when I see people with plastic containers of oils. I was just in the grocery store, in a healthy store, the other day — and I saw a tub, a plastic tub, that was transparent of grape seed oil. Just to buy it in bulk, and it was just sitting there in the light…the light's going to degrade it. It's in plastic, that's not good. What about roaster chickens in bags under the heat lamps at the store? Anything with plastic and heat with our food is not a good mix.

Dr. Drew Sinatra: And also, people are sometimes microwaving food with a Saran Wrap over top, and I'm thinking to myself, "Oh my goodness, that Saran Wrap is almost melting into your food. Please stop."

Dr. Deanna Minich: Right, yes. So here's where people get the fear factor, and they think, "Oh my goodness, what does this mean, I have to toss all of my plastic?" Here's the tip. Just don't expose the plastic to heat, right? If we can just use it as a neutral container, because we don't want to add to landfill, we don't want everybody's Tupperware to now be dumped into the landfill, and then it's just going to recirculate through everything. But if we can wait until the food cools and if we want to store it in that way, that's good.

Dr. Deanna Minich: For plastics that have been sitting over time, they will start to degrade. So that's the only thing we have to think about. So if you have plastics that are kind of scuffed, they're old. Regardless, with acid…like, if you put tomato sauce in a container like that, it's going to start to leach into…the acid and heat allow that penetration and that migration of plastics. So I think we need to be thinking about…if it's not just what we eat, it's how we're preparing it, the containers that we put to store the food is something of note.

Dr. Steve Sinatra: You know, Deanna, I'm really glad you mentioned the Teflon. About five years ago, I had breakfast at a colleague's house, and his wife was making buckwheat pancakes with some real maple syrup. And I was really excited until I saw her, she was cooking on a Teflon pan, and there was scratches all over the surface. And I froze with fear, I said, "Whoa, wait a minute." Not only is the Teflon bad, like you mentioned, but when there's scratches in it, it's a focus for bacteria.

Dr. Steve Sinatra: So now you're adding a lot of bacteria into the food. And some of these microorganisms have a high heat point where they can survive, even cooking. So I was shocked…

Dr. Deanna Minich: What did you do?

Dr. Steve Sinatra: ...because she did throw it out.

Dr. Deanna Minich: Well, it is…

Dr. Steve Sinatra: One of the ravages of being a doctor, you know, sometimes you pass that information off. But she was very, very grateful. But anyway, I'm glad you mentioned the Teflon, I wanted to emphasize that.

Dr. Drew Sinatra: Deanna, I want to ask you, you mentioned the oils, right? So what should our audience be cooking with, for oils? What are your favorite oils for higher heat, medium heat, low heat cooking?

Dr. Deanna Minich: Okay, so wait until the cardiologist hears this. I actually recommend don't cook in any oil.

Dr. Drew Sinatra: I love it, great answer.

Dr. Deanna Minich: None, none. I don't like it, and here's why. What I learned from doing my doctoral research is that fatty acids, they're going to break down in heat, light, and oxygen. Even if you have a high smoke point oil, like grape seed, avocado…people think, "Oh, I'll just get an oil that can withstand that heat. It's been modified in some way." It's just not good, you're still going to get

breakdown because every oil is comprised of different fatty acids. So even though the majority might be okay and stable under high heat, there can be others that break down. And once you break down fatty acids, these become inflammatory compounds in the body.

Dr. Deanna Minich: So here's what I say to do with oil — I use water. There's nothing better, I think, to conduct heat than water. I mean, that's even how we heat our home. We have radiant heat, we have water that goes through the system, the water gets heated, it generates that convection. Water works, and it's not toxic. We cook in water, we poach in water. Not a lot, because then you'll lose nutrients, but just enough.

Dr. Deanna Minich: Then at the end, you bring in your extra-virgin olive oil, you bring in the oils that you want, to seal it up and have the flavor. You may also want to have, separately, spices in oil that have been cooked, and then you add that into the dish. But I am not a fan of cooking with oil — not even coconut oil. I just don't think it's a good idea.

Dr. Steve Sinatra: No, I agree. I agree 100% and…

Dr. Drew Sinatra: Coming from an Italian family, though, I sometimes have to sauté some garlic and some onions in olive oil. That's what I do. But hey, sometimes it's okay.

Dr. Steve Sinatra: Very low heat, less than a hundred…

Dr. Drew Sinatra: Low heat, very low heat.

Dr. Steve Sinatra: Very, very low heat.

Dr. Deanna Minich: Low heat.

Dr. Steve Sinatra: You'll get away with it, no doubt about it. Deanna. I wanted to ask you a question, because a lot of our audience is privy to phase one and phase two detoxification. I know in my newsletters, I talked about this a lot. So basically, if we explained phase one being the body able to get the compounds to a lesser degree of toxicity — is that sort of a layman's term to discuss phase one? And things like…what helps phase one? We can talk about milk thistle, we can talk about broccoli, we can talk about certain foods. Then the more complex is phase two, where we bring in conjugation.

Dr. Steve Sinatra: So for our audience, I would like to just bring them up to speed a little bit about phase one, mention phase two, and about what nutraceuticals they can do to

intercept this. Or as you say, the liver and the GI tract, make them more conducive to the toxins we live in on a daily basis.

Dr. Deanna Minich: Excellent. Well, first and foremost, it's most important to prevent them from getting in the body, because your body has to go through a lot of these hoops to get toxins out of the body, right? So that is first and foremost. So making sure that you have enough fiber in the diet. When you have fiber, fiber is incredible for binding these toxins so that they don't get absorbed by the body. Because once they're absorbed, now your liver has to be engaged.

Dr. Deanna Minich: Your body's systems have to give a little in order...and this takes a lot of energy from the body. Detoxification, it's an energy requiring process. So why do people get so fatigued, and they can't understand why they're so fatigued? They get fibromyalgia, chronic fatigue syndrome. These are syndromes of the 21st century. It's like, how did this happen? Well, one of the ways is because we've got these toxic offenders. So first and foremost, prevent them from getting in, binders, binders. So what does that mean? More fiber, more psyllium, more flaxseed meal. It doesn't have to be a sophisticated supplement, it can just be food. More leafy greens…greens are great for binding, the chlorophyll in greens, there are studies showing that they combined the different carcinogens in food and take them out of the body. So whether it's kale, leafy greens, and it's fine to cook them, cilantro, matcha tea, green tea — think of greens to bind.

Dr. Deanna Minich: So that's first and foremost. Make sure that you're pooping regularly and not rabbit pellets, but I'm talking, like, bulk. You want bulk…we need to be talking about that, right? If you don't have bulk in your stool, that's telling you, you need more fiber. So that's first. Secondly, these toxins are very fat-loving. They hang out in fat, which is why I talked a little bit about fats and oils, it's important. So because they love fat, what they tend to do in the body is they just kind of sink into the fat tissue, and they stay there. They stay there until they're disrupted in some way — or you lose weight, which is why some people who start to lose weight, initially, they might feel good. Then after a certain point, they start to plateau, or they might start having symptoms that may or may not be due to the liberation of these fat-soluble toxins.

Dr. Deanna Minich: So your liver is the hub of engagement, not your sole organ of detox, but the liver does a lot of the work. I call the liver the general, it's the general of the army, right? So it's like, "You do this, you that." It's kind of like, it's corralling the whole body into action. So the first process is called phase one, and there are hundreds of these different cytochrome enzymes that take something fat-soluble and make it more water-soluble, because in order for your body to get it out, it's got to make it more water-soluble. So it can come through your sweat, it can go into the urine, it can get into the bile. But if it's very fatty and it stays

there in the body, it's not going to move. What is one of the most fat-rich organs? It's your brain.

Dr. Deanna Minich: About 60% to 70% of your brain is lipid, it's fat. So again, that's why sometimes chelators are used or special substances to attract these toxins. So phase one, how do you propel that? B vitamins. Many of these enzymes, there are so many of them, and they're inducible, which means that if you start to change your diet, you're going to start to change the activity of these enzymes. So this is where I say I do think it's important to have a good multivitamin, multimineral. Minerals are really key for competing with heavy metals.

Dr. Deanna Minich: So mercury competes with selenium, we kind of see that direction. So if we make sure that we have enough nutrients — and even if you're eating a really healthy diet, sometimes we don't have enough nutrients. It's just because the stresses of every day, the soils are depleted. So the phase one process, where we add in a hydroxyl group or something to make that compound more water-soluble, requires nutrients. So if somebody is nutrient-depleted, they're not going to be able to get to that phase one. Now, after the phase one process, and we see B vitamins, flavonoids are important. Gosh, a whole number of different things are important, even iron. If you're iron-deficient, you will have an issue with the cytochrome system of enzymes, they won't work well.

Dr. Deanna Minich: So somebody who has iron deficiency anemia, and many times in autoimmune cases, you see anemia that's secondary to that autoimmune condition. You don't even know, you're just tired. Is it because you don't have iron or because you need detox? It's probably both. Right? So the phase one is key for minerals, vitamins, broad-brush. Then once that phase has been completed, now you need protein. So oftentimes what I say to people for proper detox is protein plus plants, because the plants will give you a lot of the initial things that you need for phase one, and then when you move into phase two, you need sulfur. Stinky sulfur veggies are the best. I mean, even this morning, I mean, I try to make sure I have broccoli, Brussels sprouts, cabbage. If I'm not taking those things regularly, I make sure I take a supplement with sulforaphane. I'm in love with broccoli. If I was stranded on a desert island, I'd want broccoli — it's a powerhouse!

Dr. Steve Sinatra: I would choose onions and garlic, but that's my choice. But onions and garlic are really essential for phase one, as well.

Dr. Deanna Minich: They are essential…and also making soups of this, for people who don't like. Some people get stomach upset from onions and garlic. I have some family members like this, where they avoid those foods. They have intolerance in some way, maybe it's the fructans, I don't know. But anyway, cook them. You also get

the benefit when you make soup. There was a great published case study in which they took cilantro, and they cooked it with onion — and over time, seeing heavy metal levels going down.

Dr. Deanna Minich: So cook them, you know…onions, garlic, if that's what you like. And with garlic, as you probably both know, you cut the garlic, you dice it, and you let it sit for about five minutes to optimize the production of a lot of these detoxification components. With broccoli, here's a little hint. If you add powdered mustard seed to steamed broccoli, you potentiate its detoxification potential. I won't into the biochemistry, but you're preserving the myrosinase that converts the glucoraphanin to the sulforaphane. So powdered mustard seed, have that in your spice cabinet and add it to the broccoli when you steam it. So that's phase two, getting the sulfur, getting the amino acids, that will help to shuttle these things out of the body.

Dr. Drew Sinatra: Deanna, can you rewind a little bit and go back to the importance of protein there, in the phase two? Can you talk about that a little bit more?

Dr. Deanna Minich: Yeah, so once the compound has gone through phase one, and it's a little bit more hydrophilic or water-loving, now it can attach to an amino acid. Amino acids come from protein. Cystine, here's where you think of glutathione, many people have heard of glutathione. Glutathione is a sequence of three different amino acids, so this can really help to corral and move those toxins out of the body. So different amino acids can be helpful here, I would say the whole array. We do need protein…many people are eating protein, but you know what I think is that they're not digesting it. They're not digesting the protein, it's just going through them, it's maybe partially being broken down. And it could be creating an immune-like effect, because with most people having leaky gut, they're not digesting protein, now this gets in systemically. So these individual amino acids are part of attaching to the toxin, and now it can be even more water-soluble to be taken out of the body.

Dr. Deanna Minich: Now, one of the most popular ones out there that probably your viewers have heard about is the methyl group. I mean, we've all heard of methylation, right? Methylation is simply…now, this is different, this is not an amino acid, but it's part of phase two. It's where we take a carbon with three hydrogens, in some cases four, if it's a standalone compound. But we complex it with that biotransformed metabolite, and we take it out. What gets methylated? Hormones, neurotransmitters, heavy metals, and many people are, they're starting to know about their methylation enzymes. There's one out there, MTHFR, COMT. For people who are doing genetic testing, they're finding out, "Oh my goodness, my methylation is not so good." Well, what do you need to have those methyl groups? You need folate, you need vitamin B12, you need

vitamin B6. So a lot of those green leafy vegetables, again, are coming into play through detox just through the methylation factors that they provide.

Dr. Steve Sinatra: Yeah, and Deanna, I think a very, very important precursor would be N-acetylcysteine, NAC, where it's broken down to glutathione, and then you combine it with selenium, and you get glutathione peroxidase, with vitamin C on board in the body, as well. And now you have one of the best antioxidant systems around, not only for detoxification, but immune system function, as well.

Dr. Deanna Minich: Correct. Well, N-acetylcysteine contains cystine. Cystine is a self hydro-rich amino acid. So again, you're getting that amino acid to complex to that compound. And what keeps glutathione regenerating in the body? Vitamin C, like you said. In fact, there was one study in which they gave healthy women...it was a small study. They give healthy women one gram of vitamin C every day, and I think it was for two months, and they had significant reductions in organochlorine residues — just from vitamin C. Even if we just made sure that we had vitamin C, we would be good. Vitamin E, selenium, these are all important for glutathione regeneration. And this is another one where some people don't genetically have the enzymatic activity to create enough glutathione, so they need support. They need N-acetylcysteine, they need vitamin C. And that can be properly gauged with a practitioner who can coach them through that.

Dr. Steve Sinatra: So Deanna, just to summarize, we talked about the liver, and we talked about the GI tract. We haven't talked about the lungs or the skin. But on the skin for detoxification, I've always been in favor of far infrared saunas. And I don't know if you know this about Drew — I don't know if you ever brought this up before, Drew. But when Drew was going to naturopathic school at Bastyr, he ended up doing a sweat lodge with the great-grandson of Sitting Bull. It was Walking Bull, right, Drew?

Dr. Drew Sinatra: That's right.

Dr. Steve Sinatra: Yeah…and so Drew did some sweat lodges at a very early age as a naturopath. So I think sweating, and again, I think we should just emphasize that…whether it was the far infrared sauna, or what Drew did, you know, the sweat lodge. I think it's really important that sweating is just an incredible way to detox. So if we can just say a word about that, as well.

Dr. Deanna Minich: Oh, I wish I could say more than just one word. In fact, I was just reviewing some literature yesterday, and there was a study that just came out, and it was a

prospective cohort study, which is one of the stronger types. It was with close to 14,000 Finnish men and women. They tracked…

Dr. Steve Sinatra: Ooh, I like that. Ohh, I got a chill on that one.

Dr. Deanna Minich: Well, you should be warm because we're going to talk saunas. They tracked them over decades, and what they found was that those who had done sauna, I think it was nine to 12 times per month, had a significantly lowered rate of dementia over time. Now, if they did it more than 12 — like 13 to 30 — they didn't quite see an upscaled effect. There's that crucial time. And how did the Fins do it? They even looked at temperature, and they looked at the amount of time. It was no longer than 15 minutes in the sauna —one, five — and no more than 100 degrees centigrade.

Dr. Steve Sinatra: That's all?

Dr. Deanna Minich: Centigrade.

Dr. Steve Sinatra: Oh, centigrade. So that's like 150 Fahrenheit or something…

Dr. Deanna Minich: Centigrade, yeah. That's pretty hot!

Dr. Steve Sinatra: That's hot, yeah.

Dr. Deanna Minich: Now, what is that? 212 Fahrenheit. Right?

Dr. Drew Sinatra: Yeah, it's 212.

Dr. Deanna Minich: So…

Dr. Steve Sinatra: That's hot!

Dr. Deanna Minich: So there's a temperatures part, and then there's a duration. You don't want to be in the sauna forever. I remember at the clinic, I had one woman with rheumatoid arthritis. I definitely coached her into getting a sauna, but she stayed in it way too long. She was in it for like 40 minutes plus, and she actually had inflammatory events from sitting in such heat. What you want is the pulse; you want to get to the point that you sweat, and then you get out and you quickly shower, get those toxins off of you. It can be more than 15 minutes.

Dr. Deanna Minich: And if you don't sweat in the sauna, you take a skin brush. We have a Japanese friend, an elder, and he came to stay with us. We invited him to use our sauna, and he took a shower before he went in the sauna, and after the sauna. And

that's how you do it, right? You open up your pores, you go in the sauna so you're ready to sweat…you don't want to be in there forever. No longer than that 15 minutes is what the study showed, and I can send you the study if you'd like to share that with your…

Dr. Steve Sinatra: Oh, I'd love it, yeah, send me the study. And I'll tell you, Drew's a big proponent of the hot-cold. I mean, Drew, you told me that when you wrote that chapter in the textbook, remember — about doing the hot-cold and stimulating the lymphatics, the cold shower?

Dr. Drew Sinatra: Dad, as we've learned about at all these conferences, it doesn't really matter how you're sweating. Infrared sauna is fantastic. If you don't have an infrared sauna, a regular sauna is great. And if you don't have a sauna at all, do what I did last night. I took a very hot Epsom salt bath, where it was just incredibly hot, and beads of sweat were forming on my head and my arms, and I was sweating. And then you always want to end your sweat session with a rinse. You always want to hop in the shower after and get some of those chemicals and toxins that you've sweated out off your skin.

Dr. Steve Sinatra: But then using the hot-cold sequence, you're stimulating more of the lymphatics. Is that correct?

Dr. Drew Sinatra: Yeah, exactly. So let's say if you've got a sprained ankle or something, and you want to help heal it faster. You want to do, let's say, three minutes, submersion hot, and then 30 seconds cold, and repeat that three times. And that's really, kind of, a great segment there to help just bring in blood flow and help remove things that shouldn't be there.

Dr. Deanna Minich: Plus, from the circulatory system, that makes sense, right? Because you're causing vasoconstriction, vasodilation. This is like exercising the vasculature.

Dr. Drew Sinatra: Exactly. That's it, yep.

Dr. Steve Sinatra: So we did skin, GI tract, and we did liver.

Dr. Deanna Minich: Lung.

Dr. Steve Sinatra: Lungs. What do you have to say about lungs?

Dr. Deanna Minich: Breathe!

Dr. Steve Sinatra: Breathe.

Dr. Deanna Minich: Breathing. We are terrible breathers. You know what else? We're in the season now, if we think of…people are indoors, they don't have very good home circulation, they're breathing in mold and mycotoxins. They're lighting their fragrant candles, this is not good. I'm a yoga person, and I remember going to yoga class and…incense is not healthy. If we want anything that's scented, essential oils and non-plastic diffusers. Or maybe sage, just burning a little bit of that, which can be antiviral, antimicrobial. Air is the toughest one. It's hard to control, right? So we have air filters.

Dr. Deanna Minich: So I live in the Pacific Northwest, and we had wildfire smoke just about a month ago, and it was pretty serious. And thank goodness we had two filters going on in the house constantly. So we have to be looking. I mean, mold is a real issue. Those things that we breathe in, we have to be thinking of the mucosal membranes and making sure that they have integrity. Vitamin A. You mentioned NAC, which is a mucolytic agent. It helps to protect the airway tract, right?

Dr. Steve Sinatra: Right.

Dr. Deanna Minich: So in short…even saline rinse in the nose, right? Deep breathing, pranayama breathing. I mean, we really need to be taking care of our lungs, especially now during the pandemic.

Dr. Drew Sinatra: Yeah. Well, Deanna, this has been great, talking about metabolic detoxification. We should probably continue on at some other point with another podcast on detox. But before we wrap up today, we're going to share some **Wellness Wisdom** with our listeners. In keeping what we've been talking about, what is your big, one "pearl" of wisdom that you'd like to share with regard to detoxification? And what's one simple thing that people can do to reduce their toxic load?

Dr. Deanna Minich: Well, I'm going to go with more of an intuition here. I'm going to go with something that's more or less free, and that's to ensure that you have enough water. Because hydration is really key. We didn't talk about the kidneys, so this is my way to get the kidneys in there. Water, moving it through…I was just reviewing some of the literature on water and hydration. It's amazing how many people are dehydrated, right? And this changes cognition, it changes mood, we don't get toxins out, it confuses hunger signals. Drink more water. And what do the guidelines suggest? Between two and four liters per day…two and four liters per day, intermittent, between meals, primarily.

Dr. Deanna Minich: And if you don't like water, drink tea…drink herbal tea. Tea is so medicinal, so if you're having a hard time with that, just track your water through warm beverages. That can also be helpful.

Dr. Drew Sinatra: And tea without the plastic bags.

Dr. Deanna Minich: That's right, that's right.

Dr. Drew Sinatra: Loose tea.

Dr. Deanna Minich: Loose leaf tea, when at all possible.

Dr. Steve Sinatra: Deanna, I'm really glad you mentioned water. I mean, this is something that sparked my interest a little, actually the last five years. I mean, the waters right now…there's a water out of Idaho I'm looking at, as well. And I'm on the phone with some pretty interesting researchers about this. I think what you said about water…the secret is we're drinking a lot of water, but we're still dehydrated. Because the water, for some reason, it's not penetrating the cellular membrane. So the secret is you have to make the water wetter, where it gets inside the cellular membrane. So we're giving water to the cell, but more importantly, we're taking out toxins out of the cell at the same time.

Dr. Steve Sinatra: So for a future podcast, I think we have to bring in water. And I'd love to have you on with another expert on water, maybe we can do a four-way, because I agree with you. Water is going to be the secret sauce of optimum health in the future. I'm a hundred percent on board. Like I said, I've been studying it for decades, and the last five years, it's been awesome, as far as the time-consumer for me. It's been getting a lot of my time.

Dr. Deanna Minich: That's interesting.

Dr. Steve Sinatra: Even hydrating vegetables. I think the most significant vegetable you can possibly eat is a cucumber, because cucumbers literally penetrate the intracellular matrix, where now it's a hydrating vegetable. I think that's a "pearl" from my heart to yours about cucumber, because I think that's really one of the best vegetables you can possibly eat, because of hydration.

Dr. Deanna Minich: What do you think about sole then, where you take a Himalayan salt and you create a super-saturated solution, and then you put a tablespoon into an eight ounce glass?

Dr. Steve Sinatra: I like it, I like it.

Dr. Deanna Minich: I think what's missing is the minerals, quite honestly.

Dr. Steve Sinatra: Yeah, yeah, if you sprinkle it. In fact, even at Vervana, I had a Himalayan sea salt, a French Gris, and a sea salt from Australia. I combined the three salts from the

different continents because of the mineral content. People don't realize it, but ordinary table salt, you don't have the minerals. And you need the minerals, to drive enzymatic reactions.

Dr. Deanna Minich: And the polarity to get across the cell membrane, you have to drive it through.

Dr. Steve Sinatra: Exactly. You have to get it across the cellular membrane, yeah.

Dr. Deanna Minich: Yeah.

Dr. Steve Sinatra: So probably one of the best things you can do is sprinkle some Himalayan sea salt on sliced cucumber, and you get a natural ionic influx into the cellular membrane.

Dr. Deanna Minich: Or even slice some cucumbers in some water, yeah.

Dr. Steve Sinatra: That's the pearl for today, folks.

Dr. Drew Sinatra: So many pearls today. Well, Deanna, thanks so much for coming on the show, we had a blast today.

Dr. Steve Sinatra: Yeah, this was a lot of fun, Deanna, it's always a pleasure working with you. I really enjoyed it.

Dr. Drew Sinatra: Congratulations on all the different…board of directors, and the President of the American College of Nutrition. That's wonderful.

Dr. Deanna Minich: We're part of a big team, a big effort here to, again, get the mission of nutrition out there. Thank you.

Dr. Drew Sinatra: Exactly.

Dr. Steve Sinatra: All right. Bye-bye, Deanna.

Dr. Drew Sinatra: That's our show for today, folks. If you have a question or an idea for a show topic, please send us an email or share a post with us on Facebook. And remember, if you like what you heard today and you want to be an active member of the **Be HEALTHistic** community, subscribe to our podcast at **BeHealthisticPodcast.com**, or on Apple Podcasts, or wherever you download your favorites. You can also find more great content and information from us and the Healthy Directions team at HealthyDirections.com.

Dr. Drew Sinatra: I'm Dr. Drew Sinatra.

Dr. Steve Sinatra: And I'm Dr. Steve Sinatra.

Dr. Drew Sinatra: And this is **Be HEALTHistic**.

Narrator: Thanks for listening to **Be HEALTHistic**, powered by our friends at Healthy Directions, with Drs. Drew and Steve Sinatra. See you next time.