Dr. Jill Carnahan - **00:01**

Hey guys, it's Dr. Jill. What if one of the most overlooked contributors to chronic disease isn't an infection, a hormone imbalance or even genetics, but metal accumulating in your tissues today? You're going to love our guest. He's a return guest from episode number 183 on gadolinium toxicity and we're going to talk about gadolinium but also talk about other heavy metals. So you are going to want to stay tuned if you have any curiosity about this issue. If you're a physician or provider, many of which of you listen to my podcast, stay tuned because you're going to get the chemistry and the issues as far as how we actually look at the metals in the tissue and how we help our patients to heal. So stay tuned. Hi, it's Dr. Jill.

Dr. Jill Carnahan - **00:40**

Welcome to Resiliency Radio, your go to podcast for the most cutting edge insights integrative and functional medicine. I'm your host and with each episode we dive into the heart of healing and personal transformation. Join me with medical experts like today's guest on Gadolinium Deposition Disease where we dive deep and help you on your way to optimal performance and healing today. I'll introduce our guest in just a moment but I always want to remind you about other services and products you can count on from me. The first is Flat Iron Functional Medicine, my clinic in Boulder, Colorado. Actually Louisville, but right near Boulder. People have heard of that city before. We are accepting new patients. Many people don't know that and ask me if I can see them. And I have trained several mid level providers that work directly with me on all patient cases.

Dr. Jill Carnahan - **01:27**

And so if you want to be seen in our clinic and have consulting with me through the providers there, here Hannah and Fawn, give us a call 303-993-7910 to schedule a free 10 minute consult or to get scheduled. I highly recommend it if you're looking for a functional detective to help you with your complex chronic illness. Also you've probably if you've been here at all, know that I have a resource page drjill health.com full of products and services that are specially curated by me. Today's topic is heavy metal toxicity and if you don't know where to start, you can check out drjillhealth.com the detox bundle is a great way to get started. Easy and very accessible products to help you with detox of all types. So check that out.

Dr. Jill Carnahan - **02:13**

Drjill health.com and lastly, if you haven't got a copy of my book yet unexpected right behind me here. You can go to readunexpected.com go to Amazon, wherever books are sold and get your copy. And if you want a signed copy from me, go to drjillhealth.com my retail store. Just put in the memo there who you want it to transcribe to and I will sign that copy and send it off in the mail with a lot virtual love. Okay, let's get to our guest. I want to introduce Dr. Simelka, an internationally recognized radiologist and leading expert in MRI and radiology safety. With more than 350 peer reviewed publications and 17 textbooks, he's in the process of writing the ultimate heavy metal guide for physicians too.

Dr. Jill Carnahan - **02:56**

During his three decades as feel in the field, he served as director of Mr. Services and Vice chair of Quality and Safety at the University of North Carolina. He's been a leading researcher and author on medical imaging safety,

including gadolinium deposition and gadolinium deposition diseases. GDD for short. Today he focuses on the evaluation and treatment of patients with GDD at his medical clinic in North Carolina. You're going to love this episode. Let's jump right in. Dr. Simelka, I am so happy to have you back. For those of you watching, if you want to know more about Dr. Smelka, we have a previous episode, number 183, and it is a really great deep dive on gadolinium. Today we're going to broaden the topic to heavy.

Dr. Jill Carnahan - **03:40**

Dr. Simelka, you have such an interesting story and I remember last time you telling us, but let's hear it again. As far as your background, you're a radiologist and how did you get into this work on disseminating the information about not only gadolinium, sorry, gadolinium, but the other metals and things that can be toxic in our bodies?

Dr. Richard Semelka - **04:03**

First of all, It's a pleasure, Dr. Jill, to be on your program again. So thank you for having me back to talk about the broader topic of heavy metals. So to give you a quick review of my career and how I've got to where I am today. So to begin with, both of my parents were physicians. My father was anesthesiologist, my mother was a radiologist. And I followed the pathway of my mother and went into radiology. And it was exciting at the time because CT was a new imaging modality in radiology. And that, you know, really changed everything. And really fairly shortly, about the time I guess I went into radiology, MRI came on the horizon, which was really exciting because it was the same kind of maybe more information than ct, but without medical radiation. So the concept being fundamentally much safer.

Dr. Richard Semelka - **05:01**

So I did my radiology training in back in Canada in Winnipeg, Manitoba at the University of Manitoba. And from there I went to the University of California at San Francisco to study specifically mri, did that for two years. I went to Erlang, Germany to work with the Siemens research team, which is really quite an interesting and good experience on MRI physics and so on. So that was. And that was really, at the time when I was there, was when MRI became something that could be used in abdominal imaging. Well, because they were working on breath hold imaging for the first time. So I was one of the first physicians to work on breath hold imaging. And I took that knowledge and worked back to. Went back to Winnipeg, Canada, to St. Boniface.

Dr. Richard Semelka - **06:02**

And I hate to say this, but after spending two years in San Francisco and realizing that winter doesn't have to be minus 30 degrees Celsius, that, you know, you can actually be warm in the months of January, or at least relatively warm in the months of January and February, it kind of, you know, San Francisco kind of ruined me for returning to Canada. So I took a position in Chapel Hill, North Carolina, as the director of Mr. Services. I was in that capacity for 24 years. And then I went into a specific private practice combining teleradiology, but with my interest became toxicity with gadolinium. And I'll tell you how I got there is that in the, you know, the late years of me being the director of Mr. Services, I encountered three patients, I guess in about the year, we'll say 2010, 29, 2010.

Dr. Richard Semelka - **07:07**

And these were three people, one of whom was actually a dean at the, at my medical school. But two others were patients who said, you know, we had an MRI with gadolinium at your center. And one of them said, I had a burning like I felt I was on fire. In fact, you know, I initially got emails that were like a ransom note was like all cap letters being on fire.

Dr. Jill Carnahan - **07:37**

So, you.

Dr. Richard Semelka - **07:37**

Know, I paid attention. But still I thought,.

Dr. Jill Carnahan - **07:39**

You.

Dr. Richard Semelka - **07:39**

Know, so we contacted the manufacturer. They didn't know anything about it. But the third patient was then a dean at the medical school. And on top of that, you know, she said to me, you know, I came into the reading room and spoke to you, and you told me that everything would be fine and everything would go well. I had the Mr. With gadolinium. And two weeks later, when I was on, in an airplane going with my husband to, I Think to a meeting in Europe. And I felt like somebody had taken a knife and was cutting through the skin in my forearms right through to the muscle. So at that point I realized this is something real. I cannot ignore this. Even though there's nothing in the literature about this, I took it upon myself.

Dr. Richard Semelka - **08:31**

You know, I had to find out what it is. But also, you know, the issue with radiologists, and it's part of the issue today that I find with the radiology community, is that they really just diagnose stuff on pictures. They don't actually talk

to patients.

Dr. Jill Carnahan - **08:47**

Yes, yes. So.

Dr. Richard Semelka - **08:48**

They don't interact with patients and hence, you know, they don't really see the outcomes of their studies because they don't really get follow up. So I realized, hey, you know, I could do it like a radiologist and say, this is a diagnosis. You, you got this terrible reaction to gadolidium and there you go. But I realized, well, people don't want to know that they have a disease. What they actually want is to get better. So at the time, somehow or another, I got in contact with the chair of molecular pharmacy, Michael J. At University of North Carolina, and he was working on an oral variant of dtpa. And he then introduced me to the whole concept of what I'll get into a little bit because it's really the, the topic that covers everything and that is coordination chemistry of how metals are bound.

Dr. Richard Semelka - **09:46**

So this was his area of expertise. So he gave me the initial instructions. Talking about chelation, how it works.

Dr. Jill Carnahan - **09:55**

Yes,.

Dr. Richard Semelka - **09:55**

Talking about the concept I'll get coordination chemistry is. And from there, you know, I found out about DTPA being manufactured by two companies out of Germany, one of which was produced or marketed in the US By Hamilton. And from there I just set up a private practice and treated patients now for 10 years, over 400 patients. And you know, what was particularly, you know, what was particularly, I think, rewarding in addition to doing something that really, you know, was unique at the time in helping people, but was for the first time of having patients tell me, you saved my life. You know, thank you, Dr. Sonalga. You saved my life. Like before that. As a radiologist, when you actually don't interact with patients, they don't realize.

Dr. Jill Carnahan - **10:50**

You don't get that feedback.

Dr. Richard Semelka - **10:52**

You.

Dr. Jill Carnahan - **10:53**

Got.

Dr. Richard Semelka - **10:53**

The diagnosis that really made their story complete and them the diagnosis, but they don't know that. So you never really.

Dr. Jill Carnahan - **11:01**

Get.

Dr. Richard Semelka - **11:01**

Any direct acknowledgment that you've done anything to really help somebody directly from them. So that to this Day is what I find very rewarding for people who come to see me from all over the world.

Dr. Jill Carnahan - **11:14**

And.

Dr. Richard Semelka - **11:14**

Say, you know, Dr. Samaelka, you saved my life.

Dr. Jill Carnahan - **11:17**

Hey guys. Just interrupting this episode for a quick moment to remind you that you can find all kinds of detox products and services for metals and otherwise on my website. Dr. Jill health.com you can get 15% off your first order. If you don't know where to start and you suffered from mold toxicity or other environmental illness, check out my detox bundle. I put together the core foundational nutrients you need to detoxify with instructions. It's got glutathione, liver essentials, and our zeobine plus, which is also great for heavy metals. Take a look at that@doctorjill health.com and let's get back to our show with Dr. Simelka. I couldn't agree more. Right, And I couldn't agree more. I think that is why we go into medicine is to truly help and heal people.

Dr. Jill Carnahan - **11:59**

Most of us, right, but sometimes the system gets us so distant from that patient and their story. And the unique thing about you, compared to every other radiologist that was doing the same thing and might have heard a glimmer of something happening, was that you, number one, took the patient seriously and said, huh, I don't know what to make of this. It doesn't make sense. But I'm going to actually ask some more questions to find if there's a root cause, if there's any validity to their complaint. I think so many docs, unfortunately, if they haven't understood it in their medical training, they dismiss it and they don't ask the question, well, could this be possible? I know I have heard in my career of over 20 years some bizarre complaints of patients.

Dr. Jill Carnahan - **12:39**

And I think one of the most important things that you and I do is say, well, that doesn't make sense, but let's dive in, let's ask more questions, and that's how we get to these unique things. So I want to talk specifically about the key leading agents in your protocol and the topic that you just introduced. But before we do, let's start with a mystery. I think many people care about most, and that's that two people can receive exactly the same treatment or gadolinium dose or heavy metal exposure, and one remains completely well and the other one becomes profoundly ill. Like the three first cases that you encountered. Can you explain to us and to the people listening just a little bit about why do some people have trouble and other people don't.

Dr. Richard Semelka - **13:23**

Well, now it's interesting now what I'm going to tell you now regarding this is my theories, but theories based on 10 years of experience.

Dr. Jill Carnahan - **13:34**

Yeah.

Dr. Richard Semelka - **13:35**

So initially my thinking was like, with many toxins and Jill, what, what. What will be interesting is the interplay between studying gadolinium and heavy metals, which we'll get into in a minute.

Dr. Jill Carnahan - **13:49**

Yes,.

Dr. Richard Semelka - **13:50**

But the difference basically is immunology is that is the core thing. And what was remarkable that, you know, I think a number of radiologists and physicians may accept that, you know, there is a immunological explanation and it really is a reflection. And again, I think that, you know, many things in medicine I like to think of are like the stacking Russian dolls and the Troiska dolls.

Dr. Jill Carnahan - **14:19**

That.

Dr. Richard Semelka - **14:19**

You open up on and there's another. And then you open it and there's another one in there and you realize, and I think you're same position as me, that you know, you've maybe opened up four or five stacking dolls. But wise practitioner realizes, hey, there's still maybe five more inside. And I think some of those inside are actually in my mind something that deserves the person who figures it out a Nobel prize. But I think many physicians can accept, you know, you give, you know, that the Paracelsus quotation that the dose makes the poison. The more the dose, the more the poison. And that is true. But there's also two things at play. There's the dose, but also separately and related is the immunology.

Dr. Richard Semelka - **15:08**

So I have a number of patients who have gadolinium deposition disease from just a 1 ML injection of gadolinium in

their shoulder for an Mr. Arthrogram or if they have a subcutaneous extravasation and just three mls go into the soft tissues and they get a reaction. So, you know, I think a lot of physicians will say, okay, I can buy the dose thing that, you know, if they have 50mls over a course of some years of gadolinium, that with all that gadolinium in their system, some people could react to it. But 1 milliliter, that can't be possible. But this is the thing I tell people as the analogy. When you have a vaccine and you give a vaccine to someone, how much do you give them? It's typically small amount in the 1 ML range.

Dr. Richard Semelka - **15:57**

And you deliver it in a contained space like in the subcutaneous tissues so that enough immune antigen presenting cells can go there, pick it up, and then go to lymph nodes and show it to T cells to show, hey, what do you think of this? Now the difference between people like myself who've had 15 gadolidium injections and I'm fine, which good news, bad news. The good news is I can use myself as a normal, if you like, control and things like cytokine studies that I've done with Stanford. But there is a difference in the type of cytokines, but it's very complex. It's something that would require, you know, many more studies than we did. But people with disease, their immune system is thrown off and that sort of relates to many of the things that you deal with.

Dr. Richard Semelka - **16:54**

So other disease entities that can throw it off are like mold or Lyme or any other number of immune mediating diseases. That immune system has immune system dysregulation and you have an immune system dysregulation and you show it something it's never seen before, then what do you think it's going to do? It.

Dr. Jill Carnahan - **17:16**

Is.

Dr. Richard Semelka - **17:16**

Going to react adversely. So it will set off a cytokine response to suggest red alert.

Dr. Jill Carnahan - **17:23**

Yes, this.

Dr. Richard Semelka - **17:24**

Is a red alarm. This is a red alarm fire. And it fires off these cytokines, even if it's in much smaller amounts than someone like myself whose total cytokine response is enormous. But most of those cytokines are T regulatory or inflammation suppressing. And I think the other major category is that they are cell instructing cytokines, cell communicating. So it communicates to all the other cells and organs in the body. There is this abnormal material in your body, but try to ignore it as best you can. Now all that happens in normals has to be such an interesting and complex thing because it's probably more than cytokines because I think for instance it blocking cell surface receptors. And.

Dr. Jill Carnahan - **18:19**

These.

Dr. Richard Semelka - **18:19**

May be different chemicals because if you can figure out what and the, and the amazing thing is that, you know, the majority don't react to gadolinium. So, so we're in a group that there's no trouble finding us and even there's no trouble finding patients with gadolinium deposition disease to identify the differences. But I think you would really need to do numbers in the neighborhood that asthma studies have done where they've done, you know, thousands of patients to define the different patterns of asthma based on the different cytokine profile. So far what we've identified it is immunocom immunological reaction and everyone reacts to it. And the other thing I just want to point out too at this point still on the gadolin topic is all of us who get a gadolinium injection have retained gadolinium in the body.

Dr. Jill Carnahan - **19:14**

Yes.

Dr. Richard Semelka - **19:16**

And it's just the way it.

Dr. Jill Carnahan - **19:18**

Is. So yeah, correct. Like the reaction is different. Right. That makes so much sense. Because when I think about even my own history with cancer and Crohn's disease at 25, 26, and the Crohn's reaction, when I look back and I've looked at my own cytokines and understood a lot of weird things that have happened with me. My TH1, which is one arm of the T cell immune system, of the innate immune system was very aggress. So for example, when I first got Covid, it was before anyone knew Covid was around. And I got such a bad cellulitis, I ran a fever of 105 and I

had this very aggressive cytokine response, which cytokines cause fever. Right. So you can imagine, I mean, I was in my 40s and to have a 40 year old have a 104.8 fever, that's a pretty big deal.

Dr. Jill Carnahan - **20:00**

And I was almost septic. And so that's a perfect example of a whole different thing. But the immune system reacting to a virus and to me in my body, compared to my neighbor who had Covid, I, I had a very aggressive cytokine response that created a fever. And it almost went back to the kind of thing that happened with Crohn's. And in my field, like you with mold and other vector borne illnesses, we often. I'm actually looking at those cytokines and looking at the innate immune system. And in mold related illness, those people who react, they have a very aggressive response with the cytokines and so they're already like revved up. I always say it's like this angry bear waiting to pounce. So you throw one more thing on the. In that milieu and the immune system's already revved up.

Dr. Jill Carnahan - **20:42**

So it makes sense that those of us with tick borne illnesses or mold related illness or old triggered th1 responses are going to be more aggressively responding to something that's like metals in our body. So you've obviously talked about gadolinium. And guys, if you want to hear more, go to episode 183. We went in depth, but I want to take it broader, like you said, to realizing heavy metals of all types are an issue because you have started to really look at cadmium and lead and mercury and other metals. What did gadolinium teach you about them? And how did you make the switch to thinking about that as a bigger topic was your patients questions or was it testing or was it stories? How did that become about?

Dr. Richard Semelka - **21:26**

Well, I guess how it evolved is doing urine panels which include 20 metals in all. Patients, you know, very early on realized, oh my God, you know, everyone has let in them, everyone has let in.

Dr. Jill Carnahan - **21:42**

Them.

Dr. Richard Semelka - **21:42**

But then, you know, many people have cadmium. And then there are metals that people get very worried about when they see it, like arsenic and uranium.

Dr. Jill Carnahan - **21:51**

Yeah,.

Dr. Richard Semelka - **21:52**

But this is what is so fascinating in this whole story. And that's why, if I could just detract a little bit back to that. I use the term gallium deposition disease and people say, well, why do you call it gadolin deposition disease? Why don't you just call it gadolin toxicity? Because all the other metals call themselves toxicity. I tell them, well, this is the difference. And it's actually, you're looking at it the opposite way is that there's three forms of toxicity. There's acute hypersensitivity reaction that gadolinium has, there's gadolinium deposition disease, and there's nephrogenic systemic fibrosis. So, you know, what is the difference between gadolinium and these other heavy metals? Well, gadolinium is the only one. And we'll talk about this.

Dr. Richard Semelka - **22:39**

This part is actually a good thing about gadolinium, but it's administered as a chelate and it's administered intravenously at a very fast rate. No other metal is incorporated in that fashion. So you can explain then acute hypersensitivity reaction. I think if you took lead phosphate and injected it at 2mL per second in your vein, you would also get an acute hypersensitivity reaction because that's the mast cells reacting to suddenly an insult. And the other thing learning from acute hypersensitivity reaction with gadolin contrast agents is all of them cause it. So if they're linear or macrocyclic,.

Dr. Jill Carnahan - **23:21**

They.

Dr. Richard Semelka - **23:21**

All cause an acute hypersensitivity reaction. So in many respects, I see gadolinium deposition disease as a persistence of a reaction to gadolinium. And a number of patients start with an acute hypersensitivity reaction and goes into gadolinium deposition disease. In fact, the thing that I find somewhat ironic is that the only disease entity that is not observed in any other heavy metal is nephrogenic systemic fibrosis. So it's ironic that people accept nsf,.

Dr. Jill Carnahan - **23:58**

Which.

Dr. Richard Semelka - **23:58**

Doesn't occur with any other metal, but have difficulty with gadolinium. Deposition disease, which is the toxicity of every other metal. And I think, you know, part of it is that they lack the training and understanding. And I'll get into that in a minute. So to talk briefly about nsf. So how does that arise? Well, I think again, the intravenous injection and the sudden huge load, but we don't fully understand all the factors that are happening in patients with chronic renal failure. There's uremia, there's hyperphosphatemia, there's hyperparathyroidism. They also many patients who are on dialysis, they get lanthanum as a buffer against acidosis. So there is maybe five things we know about, but that probably underlies maybe 10 or so properties that occur with NSF.

Dr. Richard Semelka - **24:52**

So what happens is they get the end of the line immune reaction right up front because that sort of fibrosis generally occurs when everything else in the immune system fails. So we see that in tuberculosis where.

Dr. Jill Carnahan - **25:07**

You.

Dr. Richard Semelka - **25:07**

Get that calcification over masses and lymph nodes in the lungs because everything else failed. So the last thing they can do is wall it in, like an Edgar Allan Poe novel of walling in the. Because the immune system doesn't know how to handle it.

Dr. Jill Carnahan - **25:23**

Right.

Dr. Richard Semelka - **25:24**

And so I find it ironic that the one type of toxicity of gadolinium, which is not observed in any other heavy metal, people assume, you know, that's the only thing it can be with gadolinium. But in fact, gadlin deposition disease is just lead toxicity. And I would actually word it this way. All these other toxicities actually should be called like lead deposition disease, mercury deposition disease, because.

Dr. Jill Carnahan - **25:50**

Correct.

Dr. Richard Semelka - **25:51**

It's a heavy metal, they're deposited and they have disease. Because the reason why that's important is that the majority of people, and also with these other metals, the majority of people, I think are asymptomatic for the same immunological reason that most people are asymptomatic from gadolinium. So what do you call people? I mean, if you just have lead toxicity, then what about up the majority who have lead in them and are not sick? I mean, you call them, you know, folks with lead in them, but no toxicity. No, you would call them lead storage condition, which is what I use with gadolinium. So people like myself have gadolinium storage condition. So it's, you know, it's quite interesting then when you look at the other heavy metals and you then realize that they're all the same family and many of them share the same properties.

Dr. Jill Carnahan - **26:39**

Properties,.

Dr. Richard Semelka - **26:39**

Basically all of them cause mitochondrial Damage. All of them cause cell, well, cell wall damage. Now, they may show different pathways, but this is the same type of damage and some are more damaging than others. So arsenic is particularly toxic to mitochondrial membranes, but they all share this. So it sort of gets back to how in God's name could anybody think that you can't be sick from gadolinium when it's a heavy metal like all the others. And in fact, of all the heavy metals, it's the only one you're injecting IV rapidly.

Dr. Jill Carnahan - **27:15**

Right.

Dr. Richard Semelka - **27:15**

So any you think this is the only one that should believable and the other ones.

Dr. Jill Carnahan - **27:20**

Yes,.

Dr. Richard Semelka - **27:20**

Because the other ones. And this is what's interesting, Jill, and I want to tell you a number of things that I think people generally don't know, even if they are very knowledgeable about these various things. But, you know, you think, well, gadolinium, it's given as a chelate, it's safe. But lead, I mean, lead is like a metal and mercury is a blobby metal. No, all of these things, it's all coordination chemistry. How the, what they look like when they're taken into the body, incorporated. They're incorporated as salts, which is part of coordination chemistry. It's the heavy metal bound to a lattice structure of salts. Amongst the most common is phosphate. What happens in the body is a body will transform many of these incorporated salts into salts that are not soluble.

Dr. Richard Semelka - **28:19**

So insoluble salts, and the reason the body does it is to limit the toxicity. So it's not traveling, circulating continuously through the body. But the problem with creating it into a salt, and the most common being phosphate, so it'll be lead, phosphate, mercury, phosphate and so on is a very is this most typical form that the body translates in the heavy metals that have been incorporated. So the downside is that it means that you retain it because they are deposited, because they're insoluble. So.

Dr. Jill Carnahan - **28:56**

And let's get really practical for those listening. Where are they stored? Are they stored.

Dr. Richard Semelka - **28:59**

In.

Dr. Jill Carnahan - **29:00**

The tissue, the muscle, the.

Dr. Richard Semelka - **29:01**

It's great stuff.

Dr. Jill Carnahan - **29:02**

Yeah,.

Dr. Richard Semelka - **29:03**

It is really great stuff. So just to continue on that because you don't want to get excited and start on it. So it's all coordination chemistry. So the creation of chelates. Mr. Agents are chelates. They're just. Yeah, it's no magical safe thing. It's a chelate. And you could say, well, what's the difference between the chelate and a salt? And I guess, you know, I'd say that, you know, almost nobody knows that difference. Certainly no radiologist.

Dr. Jill Carnahan - **29:32**

Yeah.

Dr. Richard Semelka - **29:32**

So what a chelate is in the family of coordination chemistry. It is when the ligand forms a near complete ring around the metal.

Dr. Jill Carnahan - **29:43**

Okay.

Dr. Richard Semelka - **29:44**

So salts generally, or they don't form complete rings, they just attach. And, and what they have is they have a bonding structure which is a hybrid between a ionic and a covalent bond. These are hybrid bonds, which again, I mean, it's also fascinating. And when you think of like the chelators DTPA and edta. And DTPA is better for how I'll explain it, but they all have five contact points or five denditic spots. So they bind the gadolinium, or if it's a chelate made of lead, they bind it in five spots. But what coordination chemistry does is keeps the metal in its preferred oxidative state. And that preferred oxidative state for many of them is in a three plus state. So it's gadolinium three plus.

Dr. Richard Semelka - **30:42**

So the whole thing about coordination chemistry is it's molecules combining with the metal to keep it still in a three plus state. So the advantage of chelates is it's a stable binding system. And it's like, I was thinking that I could illustrate it. It's like putting on a shirt or a, you know, some sort of a, a gown where you're wrapping it around. What they do like DTPA and EDTA is they wrap around the middle and they bind with five contact spots. And you could say, okay, well then why is DTPA so much better with gadolinium than lead? So much better with gadolinium, a lot better with cadmium, but only a little bit better than lead. What is the difference between the two? If they're same, both have five binding sites? Well, this is what it's called.

Dr. Richard Semelka - **31:35**

The orientation is in a preferred state with DTPA for the binding sites of the metal. It's just that simple. So,.

Dr. Jill Carnahan - **31:46**

So let me just restate for people listening. Hold on real quick. I want to make sure this is clear. DTBA is preferred over EDTA, over DMSA and dmps. Is that correct? In that order,.

Dr. Richard Semelka - **31:56**

Yes. And we can go over. It's not true for all heavy metals. Okay, so for, for GM and lead, and those are all three heavy metals that a major repository site or retention site is bone.

Dr. Jill Carnahan - **32:17**

So.

Dr. Richard Semelka - **32:18**

Those are distinctive. Bone is a major site. So because of that, a few things are essential. You have to realize that in the agents or metals that bind into bone, they are very resistant to removal. So.

Dr. Jill Carnahan - **32:37**

You.

Dr. Richard Semelka - **32:37**

Have to use a Property that works in all forms with all these heavy metals, which is Le Chatelier's principle, that everything strives to be in equilibrium. So for instance, if you're chelating for gadolinium lead or cadmium, you remove most of it from the soft tissues, including the brain, but very little is removed from bone. To get the removal from bone, you require the natural tendency to return to equilibrium. So these metals will go from bone back to soft tissues to re equilibrate. And that's why we routinely for all those metals for. So the lead patients that I do, cadmium, it hasn't been clear. The ones that we've done have been symptomatic, but gadolinium certainly was the foundation. We've transferred that to lead because we want to allow time for these metals to go from bone back to soft tissue.

Dr. Richard Semelka - **33:35**

Because when we're treating patients, we want to think of total heavy metal content. We're not just thinking, you know, one and done. We're thinking of how do we remove the entire burden of heavy metal? And you have to do it by applying Le Chatelier's principle, which is probably subtly different for other metals which bind in different locations. Like mercury has a tendency to go to fatty structures like brain. So that cycle of. Of re. Equilibration is different. So there's so many. I don't know, I'm very excited about this.

Dr. Jill Carnahan - **34:11**

No, there's a lot of biochemistry. But you. That's per. That's really helpful though, just because I think people can get that this. And I've often talked about even like plasma exchange, which we're using for plastics and parabens. The same exact principle is in the serum. If you can clear that out, it equilibrizes over the next three weeks and

then you can do another treatment and bring another load down. And it's very different from classical detox. So one principle I have talked a lot about, that I heard you saying there is this mobilization from bone or tissue to a place where you can actually get excretion. I think many clinicians make a mistake who are not as expert as you in trying to do this, where they mobilize a metal faster than the patient's body can eliminate that.

Dr. Jill Carnahan - **34:53**

Have you run into that, like, what's the rate limiting step? How do you determine that in a patient as far as dosing? And can you make them worse if you're not careful?

Dr. Richard Semelka - **35:02**

Yeah, it's funny because, you know, it's. It's like in preparation for this presentation, I must Admit I was trying to open up a couple more dolls inside.

Dr. Jill Carnahan - **35:13**

And.

Dr. Richard Semelka - **35:13**

One of which, you know, and many of them to convey things more clearly. There's a great difference between optimization and maximization.

Dr. Jill Carnahan - **35:24**

Yes. And.

Dr. Richard Semelka - **35:25**

Most structures, and maybe especially the body, they don't like maximization, they like optimization. And you have to understand optimization is critical because if you try to do too much, you can run into huge trouble. So.

Dr. Jill Carnahan - **35:41**

Yeah,.

Dr. Richard Semelka - **35:41**

What I'd like to describe for instance with gadolinium, is that you, you cannot remove too much at once because you can create a flare reaction and to removal that can be completely out of control. And to briefly explain why, you know, if the first time the body encounters gadolinium, there's maybe 10 million T cells that will be sensitized to gadium, but over the course of a few months that 10 million replicates into then 100 million. So if you do a couple of things, if you chelate without using something to dampen the immune reaction, we use steroids and antihistamines routinely, which is a standard thing for reactions. You can get a re equilibration flare that's out of control.

Dr. Richard Semelka - **36:29**

And if you don't warn patients anyways in front about the re equilibration or sorry, better to say the removal flare, then they will think, you know, they lied to me when I got the Mr. With gadolinium because they said everything would be fine, it'll be out of my body and I'll be perfectly fine. And I got really sick. Sick. Now you're telling me that you can cure me and you've given me something and now I feel as bad or even worse than I did to begin with. And you know, what's the explanation? Well, now you have a hundred million cells reacting to get to the movement of gadolinium rather than 10 million to start with. So that's why we always do steroids, to control it.

Dr. Richard Semelka - **37:10**

And the other thing that I've learned to do is I, I first of all inform patients about all of these things.

Dr. Jill Carnahan - **37:16**

And is that steroids before you. The chelator? Correct. I just want to clarify that. So you'd give a steroid just like we would with IVIG or some of these other immune modulating processes. We would, you would give that so that you modulate the immune system reaction as you're moving and mobilizing the metals. Right,.

Dr. Richard Semelka - **37:33**

Right.

Dr. Jill Carnahan - **37:34**

Okay.

Dr. Richard Semelka - **37:35**

So the other thing that is interesting. You know, you could say, well, if everybody has lead in them and if it can all be removed.

Dr. Jill Carnahan - **37:45**

Yeah,.

Dr. Richard Semelka - **37:45**

You know, what would that do to the healthcare system? What would bankrupt the healthcare system if the government had to pay for that? So the reality is though, and I think the numbers are similar to what I've deduced from gadolinium, that maybe 1 in 10,000 are actually sick from.

Dr. Jill Carnahan - **37:59**

Any.

Dr. Richard Semelka - **38:00**

Of these other heavy metals. But what I find interesting is that with gadolinium for instance, you know, the insult, you had it right away, it happened quickly and then within, usually within a couple of days, but it may be up to a month, you get the symptoms. So people who have toxicity from gadolinium maybe only.

Dr. Jill Carnahan - **38:22**

Said they're coming to you with knowledge, right? Yes, they're coming to you already.

Dr. Richard Semelka - **38:27**

Knowing.

Dr. Jill Carnahan - **38:29**

Sorry, go ahead.

Dr. Richard Semelka - **38:31**

Because maybe 70% kind of realize that mainly because, you know, they have other diseases, maybe major accidents or stuff like that. So they don't recognize it sometimes also legitimately, because the symptoms don't appear for a month. But quite often nowadays, while the number is lower, it's because the doctors talk them out of it. They talk them and their family out of it. No, you can't, because your kidneys are normal. But.

Dr. Jill Carnahan - **38:55**

The.

Dr. Richard Semelka - **38:55**

Point is that is an immediate insult that happened and the reaction is quite soon afterwards. So I think, well, you know, what about lead and these other metals? You're taking them in very small amounts constantly over a long period of time. How do you know that you're toxic from it? And the problem is that, and again, the symptoms are all very similar with these metals with basically all of them different severities and different things like bone pain is particularly aggressive with cadmium, but they all have sort of central cognitive impairment. They have peripheral small fiber neuropathy. So they have pins and needles. They have digestive issues and they have, you know, many of them to a greater less extent have kidney issues. But there are many of the symptoms they all share.

Dr. Richard Semelka - **39:49**

But the problem is that those are the same symptoms of all of the chronic inflammatory diseases that you work with. They're the same set of symptoms. So how do you know? Well, this is how you know. And it's interesting. It's the same type of response that happens in the body generally. Like if you have a laceration, which is one of the commonest injuries, there's a triphasic responses. First exuberant collagen production or sorry, there's. First there's destruction, then exuberant collagen production, then remodeling. That's a three phase process. Well, any heavy metal. It's interesting. This is what we over Years of really just selling gadolinium and then getting into others like lead and mercury, you realize you have the same three phase triphasic response. First is removal.

Dr. Richard Semelka - **40:39**

And it kind of makes sense if you're sick from a metal, if you suddenly bring it back into the circulation a large amount, if you're sick from it's going to make you sick again. So that's clear. And then what you hope and it does occur is in this, in the middle portion. So the second week people start getting improvement. Now.

Dr. Jill Carnahan - **41:00**

With.

Dr. Richard Semelka - **41:00**

Time, you know, that period of improvement gets better and the flares get less. But the other thing that's very distinctive with the metal depositing, the bone depositing metals of gadolinium, lead and cadmium is in week three, you get the symptoms returning. And why is that happening? It's from the. These metals moving from bone.

Dr. Jill Carnahan - **41:29**

Equilibrium, right? Yes.

Dr. Richard Semelka - **41:31**

Soft tissue. Yeah,.

Dr. Jill Carnahan - **41:32**

It's.

Dr. Richard Semelka - **41:32**

A re equilibration. So that's how you tell. And so the point is that, you know, in confusing cases that have all sorts of things going on, you know, it's easier if gadolinium is part of the story because almost certainly. And as you're saying Jill and yourself, I mean once you start adding in a number of different immune mediated inflammatory diseases, you are set up.

Dr. Jill Carnahan - **41:55**

For. Exactly.

Dr. Richard Semelka - **41:56**

Immune disease. And you also are the typical patient that we see. You're a white female and they're also generally lean. So I would say 70% of patients with GDD are kind of like you are.

Dr. Jill Carnahan - **42:10**

Yeah.

Dr. Richard Semelka - **42:10**

White females, relatively lean build and you know, from the age from 18 to 55, 60s usually. When it starts. And it starts, I think in an age where your immune system is strong, even though it's dysregulated, it's still strong,.

Dr. Jill Carnahan - **42:28**

It's still robust. Because if you actually get immunocompromised and you probably have less reaction because you're completely like a cancer patient or a chemo or a organ transplant. That makes so much sense. So a couple things come to mind and then I want to kind of wrap up, you know, what the big questions people have because already this has been so fascinating. I knew it would be. As you talk about the toxicity of metals and the re. Equilibrizing, whatever that word is, it makes so much sense because we deal with that with mold and as well I find patients, it's more lipophilic. So it's in the fatty tissues, fat soluble. But as I detox them, I know that If I go too fast

and they can't eliminate those toxins, they get way worse before they get better.

Dr. Jill Carnahan - **43:10**

And then over time, that, you know, moves. It's, it's different from metals, but it has a lot of the same hints of what's happening. And then I remember back, you know, as a breast cancer survivor, I've had multiple breast MRIs, and one particular year they wanted me to have two or three. And I remember being like, you know what? I know this is the only way you can image breasts. So for women listening out there, I think it's relevant because we know breast MRI for younger women with dense breasts is so powerful of a tool, but it requires gadolinium. And so for that year, I said, no, I can't do it. I don't care what's happening with the breast. I don't want to take, you know, more than two doses of gadolinium in a certain amount of time.

Dr. Jill Carnahan - **43:47**

Is there a recommendation, say someone like me who has a very high risk with history of breast cancer and breast. Mr. In a younger woman is actually very effective over some of the other modalities like ultrasound or a mammogram for this, you know, tissue. What would you recommend? Do you give any advice specifically about how many misses you could get in a certain time frame?

Dr. Richard Semelka - **44:08**

Well, you know, as a whole, the fewer you can get that. So it's sort of like a cost benefit analysis. And I think, you know, I'm in a situ. The situation or the way I see this issue, it's different than, for instance, physicians, and I have a number of physicians who had Mr. Mammography that got gadolinium deposition disease from it. I am of the opinion that it still is a useful.

Dr. Jill Carnahan - **44:39**

Yes,.

Dr. Richard Semelka - **44:39**

Study. Galileo enhanced mri. But. And this is the thing that I find that I've been saying from the start, and I'm sort of, if you like upset and getting more upset, that it's not routinely done. But what you have to do is when a patient comes back or, you know, anytime you have them getting an Mr. With Gadolin, because you don't know what they've had before, you ask them, have you had a gadolinium enhanced Mr. Before? And do you think that you had some symptoms that arose from it? Because it's not unusual, for instance, that the first time that you get gdd, it may be mild and it may. Your immune system will recover from it, you know, within a few months.

Dr. Richard Semelka - **45:23**

So you may not sort of think that this is like an immune reaction that you've had to the gadolinium, you maybe think it's anything else, you had a virus or something. Right. But you have to ask them, have you had an Mr. With gadolin before and have you been sick from it? And you know, the classic symptoms, but basically there's a hundred different symptoms, but the classic ones are brain fog, our pins and needles, skin pain, bone pain and muscle fasciculation. But then it disturbs everything else, the heart, the GI tracts. But ask them, were there anything that came up like that? And if they say yes, then guess what? You use the classic treatment for all metals and all toxins. You don't get another one. You know, and I'm sorry, it's not like we'll try a different gadolinium agent.

Dr. Richard Semelka - **46:18**

No, you just never get another. So then, you know, there are always alternatives. I also tell people, and when they ask me for it, for instance, as you're suggesting now about, you know, alternatives, and I tell you, well, I'm a radiologist and accomplished in what I've done, but I don't pay attention to the breast imaging literature. So if you want me to figure out what you should get, I can do it, but I'd have to research it and I would, you know, do it probably better than most, because this is what I know.

Dr. Jill Carnahan - **46:54**

But.

Dr. Richard Semelka - **46:55**

The point is, and this is one of the issues I have with a lot of physicians is they spitball out something like, no, you can't have gadolinium toxicity because your kidneys are normal without actually knowing the literature. So for instance, yes, there are alternatives, including you could argue in the Moder era that do you need, you know, if you've had gadolinium before, then you have a mask that you can use for the current study and using AI, you should be able then to put the prior study on top to see what, how it compares.

Dr. Jill Carnahan - **47:27**

So potentially you could do a non contrast, is that what you're saying? So potentially you could do a repeat non contrast breast Mr. Beautiful. That's a really good option. That, that maybe.

Dr. Richard Semelka - **47:42**

That's the other thing. There's always options.

Dr. Jill Carnahan - **47:44**

Yeah.

Dr. Richard Semelka - **47:45**

So there's a few things that do frustrate me when I see that's happened to patients. And I think it's just worth mentioning. And then let's get back more globally to heavy metals. But I just, you know, almost invariably still to this day, even though it's clear literature, even stuff that I haven't written, that gadolinium stays in the body for A long time. In fact, it stays there for as long as you live if it's not removed. But it's certainly in large amounts. It stays measurable amounts till 3 months in measurable amounts. Beyond that, it's embedded in tissues, but it's measurable in the circulation and in urine without any chelation. So the critical thing is you tell patients that gaddling, you don't tell them it's gone in 24 hours.

Dr. Richard Semelka - **48:32**

You can say the majority of it is gone 24 hours, but a little bit does stay in there. And you can't say that you can't get sick from it. You can say, well, people can get toxicity, but it's extremely rare. But, you know, and if they pursue that line, you know, you can say, well, these are the classic symptoms that you can watch for afterwards. And if you get them, you know, you shouldn't get another gadolin enhancement, but instead they say, no, it's out of the body in 24 hours and nobody gets sick from it. You know, and that is just inexcusable misinformation. Because the first step is if a patient stops after getting, you know, an. Mr. That shows they have gadolinium deposition disease. If they don't get another one, a number of them recover on their own.

Dr. Jill Carnahan - **49:20**

And.

Dr. Richard Semelka - **49:20**

The tragedy is that many people keep getting gadolin hair stem, they to investigate what turns out to be gallium deposition,.

Dr. Jill Carnahan - **49:27**

Right? And then.

Dr. Richard Semelka - **49:28**

You're. And then it gets worse and worse every time. So to stop that. But what's interesting now, expanding it to other heavy metals, I think that there are other relationships. All of these things are related, just like we're talking about the relationship between various immune mediated inflammatory diseases, all contributing to a sort of immune system dysregulation. All of these things interact. So I find that some people who've maybe had gadolinium, maybe it was a long time ago and it's no longer present, but I think that it triggered a lead deposition disease and a cadmium deposition disease. Because I have now a couple of patients that their Gadolonema is basically 0 pre and post chelation. But they have all the symptoms of the other patients with gadolin deposition disease, which happen to be the same symptoms of lead.

Dr. Jill Carnahan - **50:28**

And.

Dr. Richard Semelka - **50:28**

Their lead and cadmium are high. So the point is that I think that all these other heavy metals, the diagnosis of them is very poor. And it's understandable because it's very insidious. And it's not like you get, you know, one blast of intravenous lead. And then you have, you know that it's lead. So one has to be alert to the possibility is could this be even if they haven't had gadolinium, could this be another heavy metal?

Dr. Jill Carnahan - **51:01**

Could.

Dr. Richard Semelka - **51:01**

It be mercury? Could it be lead? Which is everybody has could it be cadmium? So the way to see is, you know, you give them calcium DTPA IV and see if they have a triphasic response. Starting with you give it to them. They suddenly say their symptoms are now within 24 hours worse than they were.

Dr. Jill Carnahan - **51:22**

Before.

Dr. Richard Semelka - **51:23**

You know that they are reacting to whatever heavy metal that you pulled out. So we always get then a 24 hour urine pre and starting one hour post, another 24 hour urine. So the hour in between if they have to or want them to urinate so they eliminate urine. That would not happen. Have been exposed to the key later.

Dr. Jill Carnahan - **51:46**

Okay.

Dr. Richard Semelka - **51:46**

So but.

Dr. Jill Carnahan - **51:47**

That's super helpful too because I was going to ask you about diagnosis. Well, we have to wrap up this. We could talk for hours on this topic. And I know the listeners. I know. Right. I just want to review. You said something really important. So for those of you listening and then you can correct me, Richard and I want to let you end us with the last 30 seconds of a question I have for you. But you said if someone is facing this, they're concerned about. I think a lot of women or men or people listening are like, well, what do If I need an MRI and it's requiring gadolinium? And I think you said you can ask the radiologist, your doctor, does this actually require contrast which is being used? Is gadolinium actually being used?

Dr. Jill Carnahan - **52:26**

Have I reacted previously asking those questions about your own history, the neurological symptoms and the brain symptoms. Is a repeat contrast study needed? That was me with the Mr. Breast line. Do we really need this? Can I go without it and is there any other non contrast or imaging options available? So just kind of really questioning because nowadays again with AI intervention with radiology, there should be more and more options for us without gadolinium. For those who may be concerned. Now here's the last question for you and we can wrap in just a minute or so.

Dr. Jill Carnahan - **52:59**

If someone has unexplained neurological symptoms, burning bone pain, brain fog, or systemic symptoms after an MRI or suspects that they have a total body burden of mercury or lead or cadmium, what is the one thing that you would want them to know that their physician may have never told them? What's like the one cap that they might want to know, to find out more about this.

Dr. Richard Semelka - **53:22**

Well, I think one, the one thing that I think is important to tell people is hope, is to give people hope. And at this point in time, of all the toxins, the one that most clearly is treatable is heavy metals because they can be removed from the body quite specifically. So not like with a more non specific plasma pheresis approach, but specifically removing that heavy metal. So to give them hope, you know, if you have a heavy metal and we can test it and look if you have the flares and if you have it, the good news is that these can achieve near cure. You can get your life back.

Dr. Richard Semelka - **54:01**

But the other thing that I just related to this that's important I think for practitioners to know, and I don't think they know it, that the target, you know, when you're thinking of what is an ideal chelator, it should have a high binding strength.

Dr. Jill Carnahan - **54:15**

Yes.

Dr. Richard Semelka - **54:15**

So the binding strength, you know, it's just like calories. It's a number I'm going to give the audience the binding strength you're looking for, which is the intrinsic thermodynamic stability. And this works for all heavy metals is 20. So if you have a binding strength of 20, you're dealing with a good chelator which will work well. So then you can and these, this data exists for many of the different metals with different chelators and you can see where the chelator fits on it. But DTPA for many, but not all. For instance, you know the thio groups in arsenic, DMSA is a much better agent because it has better binding for that. But for many of them, you know, DTPA is really a very effective based on for many of them it's about 20.

Dr. Richard Semelka - **55:09**

So you look for and you know to test if your practitioners are paying attention to the literature and knowing coordination chemistry. So you know,.

Dr. Jill Carnahan - **55:19**

Amazing.

Dr. Richard Semelka - **55:19**

I would like to use something that is high binding strength and I understand that 20 is sort of a good target number. Does this have a binding strength of around 20? You know,.

Dr. Jill Carnahan - **55:28**

Excellent. Oh, this has been so chock full of really good information. If people want to find out more about you and your clinic and your work, where can they go to find out more about you?

Dr. Richard Semelka - **55:42**

Well they can go to my website, Richard Simelkamd Consulting PLLC and I think it's if you go www just richardsonelka.com you find.

Dr. Jill Carnahan - **55:56**

You.

Dr. Richard Semelka - **55:57**

So yes, it would be a pleasure to help other people.

Dr. Jill Carnahan - **56:02**

Yes, it's amazing the work you've done. It is so fun to have you back. And we're gonna have to have a third because we didn't even get close to as deep as we could have gone with the other medals and all that. But I feel like we gave a really good overview and I hope that if you're listening out there, you have some hope. If you have experienced symptoms after an Mr. And if you haven't, but you still suspect you have other body burden of metals, it's a worthy topic to dive into. So thank you again, Dr. Simelka, for coming on the show. Hey guys, hope you enjoyed another great episode with Dr. Simelka. He is coming out with a book for physicians, if you're a physician out there, the Definitive Guide to Heavy Metal Detox.

Dr. Jill Carnahan - **56:43**

The publication information will be in our show notes and it is not yet out, but stay tuned because I know I'll be one of the first ones to get that book and take a look. And I know if you're a practitioner out there, you want to know more about how you can optimally treat your patients. Please, like, subscribe. We've now over a million subscribers on YouTube, which is amazing and I'm so grateful. If you are on Apple or Spotify or any other audio platform, would you please do me a favor? Would you stop by and leave us a review? We've really focused on the YouTube platform. I love the video I output there, but we'd love to have more reviews on those other outlets.

Dr. Jill Carnahan - **57:18**

So if you like and enjoy this podcast, it would be a great help for me for the podcast to leave a review. And as you know, we have new episodes coming out every week. So I will see you again next week for another episode of Resiliency Radio. Until then, be.