Iodine Uncovered: The Answers Your Thyroid Need Transcript

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Introduction and Guest Background

So I am here with Doctor Alan Christiansen today, who is a board certified naturopathic endocrinologist who specializes in thyroid health. He is a New York Times bestselling author, and his works include The Hormone Healing Cookbook and The Thyroid Reset Diet.

Doctor Christiansen was the founding president behind the Endocrine Association of Naturopathy Physicians, and has trained thousands of doctors worldwide in natural thyroid care.

He frequently appears on major national TV shows such as Doctor Oz and The Doctor's The Today Show. And his expertise has been featured in publications like Women's World and Natural Health.

He also happens to be a friend and longtime mentor of mine and the person I go to with great questions. So excited to dig into this interview! Today we are going to learn a lot.

So, Doctor Alan Christiansen, I am so excited to dig in to this conversation with you. Selfishly for me, but also for everyone else tuning in. So thank you so much for taking the time.

Well, thanks for doing this whole event and thanks for having me. I'm glad to be with you. Yeah. So I feel like in the world of thyroid, there's a lot of misconceptions and things that need clarity, which you happen to be one of the people I go to for clarity on quite a few of these misconceptions.

So one that I want to tackle today is the topic of iodine, right? Which you are a wealth of information on. So I want to dig in a little bit and I've obviously I've read your book.

I've, we've had so many conversations about this, but I kind of want to start with the generalities, kind of introduce people to this concept of iodine and the different viewpoints of it.

Sure, sure. You know, it's a curious thing. A lot of a lot of things we talk about in the thyroid world are different than they are elsewhere, because a lot of it comes down to micrograms, like microscopic amounts of things.

Iodine Basics and Thyroid Paradox

Most nutrients that do a job, they we often get too little of them, and we're rarely in danger of getting too much. That's a safe rule for a lot of nutrients.

You know, a vitamin C, you know how much we need versus how much is harmful. There's this massive window. You know what you're getting a there's not a common risk of getting too much.

But here's where things come in with a paradox. So yeah, we require iodine. We need it. It's essential. It's necessary for all life. You know, it's pretty much how life got started was by transferring iodine.

Actually, this is a primordial story, but as life left the ocean, we developed the capacity of storing iodine in these particular molecules. And that's how thyroid hormones formed.

So the earliest versions of life relied upon these kinds of reactions. Now the wrinkle is that humans adapted to two different ecosystems. So one one group.

So one group of human ecosystems was primarily coastal. You know, they were mostly near oceans. And they had a lot of access to iodine rich foods. That's where I don't come from.

And another big ecosystem was quite away from the oceans. So they adapted to lower iodine environments. And these are genetic adaptations. So yeah, humans were good at tolerating a lot or getting by on a speck, but we can't really do both very well.

And so the genetics that correlate with thyroid disease today are pretty much the genetics that correlate with humans being adapted to being away from the ocean.

So those are humans that do really well on lower amounts. If they are exposed to higher amounts, they've got a risk of developing thyroid disease from that.

Fascinating. Because obviously in the stratosphere of even like integrative medicine, so many people propagate this idea that, you know, access kind of more high amounts of iodine can help thyroid function, and we need it.

But the reality is, is we don't need a lot of excess iodine. Correct. Well, and the weird part is that there's a lot of cases where a short term, a really high dose, acts like a low dose in the body, and then you think they're on to something that's helpful.

And here's why. So there's a certain amount that we need. And because that range is narrow for all people, there's many things that regulate how iodine is used.

We don't have these same things for other nutrients. The main mechanism is one called the sodium iodide simple water. It pulls it in. If we require it, it blocks it when we have enough.

And the paradox here is that once you get above your personal tolerance, you block it. So there are people to where they're above their needs, and if they get a whopping dose, they actually stop taking it in.

And for a little while. That's helpful. And yeah, that's that's why I mean, is used for things like to stop an overactive thyroid because you can give a bunch and shut it down, or that's why dying prevents against damage from radioactive iodine, because you shut it all down and none comes in.

So yeah, really high dose can act like none for a while. Then that's created situations where a lot of folks don't understand that and they think, oh, I really need more because it seemed to help for a little bit.

Right. And give us an idea, I mean, I get this question all the time. Give us an idea of how much iodine people with thyroid conditions actually need. And, you know, a perspective about in micrograms, how much actually is that?

Right? You know, and this is a question too, where we have more data points to draw from than we do for any other known nutrient by far. We started tracking this back in about 1924, when we fortified salt with iodine in the United States, a little before then in Sweden.

But as we started tracking the numbers. So the sweet spot for adult onset thyroid disease is somewhere between about 50 and 200 micrograms. You know, people's daily intake is in that range.

We see the lowest rates of adult thyroid disease. The more you get on either end, especially on the higher end, the more the rates of the disease go up.

And tell me about this concept of the Goldilocks mineral. Is that what bleeds into that label. It is it's, you know not too hot, not too cold. There's a, there's a dumb joke about a statistician who had his head in an oven and his feet in an ice bucket, and he was comfortably at 72 degrees on average.

Some people would say, well, Americans are getting a good amount.

How Much Iodine Is Too Much?

Well, average is actually pretty decent. But one of the recent reports from the American Thyroid Association

showed that about 30 to 40% of people per age, gender and ethnicity are at that unsafe range.

They're at a level that's above 200 micrograms. And for many people, if they're not genetically prone to thyroid disease, they can probably safely consume even 1100 micrograms on occasion.

Okay. But those who are genetically prone to it, all these genes that correlate with thyroid disease are genes that regulate the Odin Ace enzymes. They're iodine regulating enzyme genes.

And if someone has those genes, the more time they spend above 200 micrograms, the more risk they have for developing disease and for for a demographic that's about a third of people that are in that range.

Wow. And I mean, that is fascinating. And I remember when the Thyroid Reset Diet came out, your book about, you know, this topic and the it kind of blew my mind, this concept of, hey, we're we're supplying all these people with extra iodine and salt, etc.

but it's fascinating how much access to iodine we actually get in foods that we eat every day. Right. Well, that's that's the thing is that even if you're not trying to get it or being deliberate about avoiding it, we always get at least like 50 or 100 or more micrograms.

And there's a lot of foods, you know, healthy foods. There's things like pink, Himalayan salt, salmon, you know, really good things that can have amalgams that push us over the edge or there's things like more processed foods.

You know, there's weird stuff like, some types of, of sherbet, you know, or desserts that have certain food colorings that have massive amounts or, you know, no, like, like over over 600 micrograms per serving, you know, you can find this hard candy, same thing.

Oh, a weird one is bread. So a lot of folks, you know, go gluten free. See, the third got better. That's awesome. The biggest relevant factor probably is the fact that they radically lower their iodine intake when they do that.

And it's not even about the grains or gluten per se. It's about processed commercial bread products. Even some of the gluten free ones. And some products will say in the label this contains an iodized dough conditioner, like, oh yeah, well, there it is.

But they've done studies where they've bought products at the store and say they're iodine content. And there's a lot of things in processed foods that don't even make it on the label.

And some of the hidden sources of protein are like that. So there are a lot of commercial breads that don't say iodized dough conditioners, but they can have like 1100 micrograms of iodine per slice.

Per slice. Per slice. Yeah. Oh my goodness. And yeah I mean that's like you wouldn't even think that that would need to be included on a nutritional label.

I mean it would be amazing, but I'm sure it's not required. Well, there's no there's no requirement. And sometimes the ingredients will be present. Sometimes the ingredients are not even listed.

But there's no labeling for iodine content on food products in the United States. Wow. Okay, so sherbet candy, processed foods, what are some other are like hidden sources.

You know, a big thing is personal care products. People have not think about that. It used to be the case that many of the the medical hand sanitizers use iodine among other sanitizers and, and here's the thing.

It's a really good sanitizer. So think about like bleach or hydrogen peroxide. And imagine pouring peroxide on your skin. And you see a bubble in your skin instead of white.

So that's a free radical reaction occurring. There's there's singlet oxygen coming out. You know, H2O is water, H2O

two is hydrogen peroxide. And there's really not a good place that second oxygen molecules stay.

So it breaks out and it oxidizes things. So yeah oxidizing compounds are sanitizing compounds. So peroxide bleach iodine they're powerful oxidizing compounds.

They generate free radicals. They're really useful to make lotions and creams not go bad and not separate out their ingredients. They work well that way.

But the drawback is we absorb that. So yeah back to four 2018. This was a big part of hand sanitizers. And then it was found that many health care workers were getting iodine toxic from that.

So. Well, because they're doing it all the time. So they were banned in but they're still in a good range of personal care products. And I you know, I read it, I read about this and I did a lot of math to see if this was even relevant or not.

Hidden Iodine Sources in Food and Products

So the main thing used is polyvinyl pyridine, also known as PvP. Now, if you buy natural personal care products, they won't say that. They'll say kelp extract.

It's the same thing. Well. Or they'll say sea vegetable extract, the same thing. So anyway, so PvP now there's not a lot of it in most formulations, but you buy it conditionally buy body lotion and there might be about 1% PvP in there.

Again, it does some useful things. It makes it have a longer shelf life, and then PvP is about 12.5% iodine by weight, and we don't absorb all of it. But intact skin absorbs around 4.5% iodine if it's left on for more than a minute or so.

Well, now here's the deal. This is a thing about micrograms. Again, I went and took, you know, with my wife Karen. So I, I took her conditioner and I did a few pumps and I weighed that.

And like, do you use two pumps, the other two bars. Okay. So I weighed that. It was about 20g. Now in our microgram thyroid world that's 20 million micrograms, right?

So 20 million times 1%, you know, chop down a lot times 14.5%. Chop down more for the percent of 18 times 4.5%. So you keep chopping it down. But when you're done, what you see is that you can get like 2000 micrograms into your bloodstream by taking a shower.

Wow. I can guarantee you there's not another person on the planet that realizes that except you and everyone you've shared that with. That's incredible. Okay.

And then how long would that circulate in your body before it's properly excreted? Well, that's the thing. So I mean, it doesn't circulate in the body.

There's many compartments. So blood serum, thyroid there's other tissues that take it up. So when there's an excess in the thyroid it can stay trapped for pretty much long term.

The amount that we ingest, we excrete a certain amount each day to try to stay in balance. And mostly we do excrete through our urine when there's a lot.

Some goes through our stool. We sweat some out too. But when there's an excess in the thyroid, the problem is that the only way iodine gets out of your thyroid is by your thyroid.

Making thyroid hormones, making iodine into that, you know, to be totally precise, there's a spec that leaves non-hormonal secretion. It's called, but it's pretty much irrelevant.

So so really, you know, thyroid can only get rid of it by making hormones. Now, when your thyroid is underactive, it's not making a lot of hormones. Right?

When extra amounts get in there and cause damage, they get stuck. In the same way peroxide can burn your skin or bleach can. That unprocessed iodine just burns things in your thyroid.

It triggers an immune response and it damages thyroid cells. Wow. And tell me, is that how it's interconnected with the autoimmunity piece or is it a different mechanism.

So simple. So with autoimmunity there's there's a lot of parts of thyroid autoimmunity that we know about. But we can't really measure clinically. Clinically the main things we measure anti thyroid peroxidase and then antiviral globulin.

Well thyroid oxidase ASC means enzyme. And this is an enzyme that makes iodine ready to oxidize. It turns it from an inactive state to an active state.

And that's its job. And then the thyroid globulin that's the protein that stores iodine. So when there's too much activated iodine and there's no proper places to store it, thyroid globulin and thyroid peroxidase become attacked by the immune system.

Interesting. Okay. And when when you think about like with the thyroid reset diet, if when we reduce iodine exposure, when, we track antibodies as a measurement.

Right. Maybe the load of autoimmunity. Do you feel like one of those two antibodies responds more to the thyroid reset diet? Tell me your experience with that because I can share like a really interesting patient experience I had with it.

But I'd love to hear your input. Well, interesting thing is that the antibodies in terms of the development of thyroid disease, most research has shown that.

So for starters, about half of people with autoimmune thyroid disease don't have measurable antibodies. So there's that you can. See are negative. And have negative antibodies.

So they don't perfectly correlate. And the other wrinkle is that many people that have low to moderate elevations if their antibodies never develop any thyroid disease.

So there's there's tricky things both ways there. Right. And then the other wrinkle is that if you see someone who has clear Hashimoto's and you can go back in time, the typical scenario is first thyroid globulin elevates, then it comes to low to negative and then closer to when the disease manifests, thyroid peroxidase elevates.

So the most common scenario is to see higher thyroid peroxidase and lower thyroid globulin, not universal, but that's the most typical manifestation when Hashimoto's is diagnosed.

Some have different manifestations, some are diagnosed at earlier stages. So that was a long way of saying there's a lot of it depends in play, but there's a little more literature about lowering of thyroid globulin by reducing iodine, the lowering of thyroid peroxidase.

There's literature and both can happen. But yeah, that's what we know about from medical literature. In I feel that it's harder to lower thyroid globulin antibodies.

I feel like that's the the antibody that seems to get a little more stuck, a little harder to influence. And I had a fascinating case of a patient who'd been my patient for 6 or 7 years.

We had gotten her TPO antibodies to zero, but she had persistent thyroid globulin, antibodies that would not budge. And then she went on the thyroid reset diet.

And every time we tracked them for two years, they reduced until they were gone completely. And it was, I mean, consistent every darn time. It was fascinating. I meant to email you.

Maybe I did, maybe I emailed you about it, but I it was it was really, really cool to see in real time with someone that I'd worked with for years.

Iodine Testing, Deficiency, and Goiter

You know, the rare cases where someone doesn't respond in situations like that, there's either either they had a very high exposure to iodine because there are some super high sources out there, and they still need time to clear it.

Or there were some sources they've not identified. You know, those those two things happen. But but barring that, yeah, it's pretty consistent for bringing them down.

Right. So I mean I would say if you're out there listening, you have antibodies especially obviously thyroid globulin that are stuck. I would absolutely advocate for checking them every three months.

And especially like pick something personal care products. What are some of like you mentioned? There's really, really high exposures at times. What would that be that maybe people aren't aware that has happened in their life?

It's tough. There's so many people that really mean well. But if you if you understand, like the first little layer of thyroid physiology, you can get misunderstandings about this, you know.

So again the thyroid needs iodine. And there's a lot of nutrients to where the body needs it. We don't get enough. Maybe they're not absorbed and people have found that if you take a higher dose it works great.

So that idea persists in the thyroid world. And there are popular supplements that contain about 200 times above what's considered a safe daily dose of iodine.

And yeah, there's it's sad because there's reports in the medical literature today naming products by name, saying that here's babies born with congenital hypothyroidism because the mom was taking these products and someone told the mom, you need to take this much to help your babies and the books that talk about taking iodine say, you've got to take this to help your babies.

And there's babies born with birth defects because it's just not safe. So that's just one example. And it gets my heart rate up just talking about it.

But yeah. And again everyone means well. But there are products out that contain you know back to that 200 microgram range. There are products that contain 50,000 micrograms per tablet and that's.

For human consumption. What's that for human consumption like for people today. Yeah. Yeah. Oh goodness. There's also a lot of products that are not made for human consumption but are promoted for human consumption, like Google's drops that are also about 50,000 micrograms per drop.

A lot of folks are told to take multiple drops per day. So these things happen. Let's recap that. So 50,000. I had a patient that I known forever who was the healthiest guy you can imagine.

He was in his 70s. He's like, he was like my idol. I want to be like you, right? 70 I have those two. Well, and he was a snowbird. So practicing in Arizona, I saw him seasonally.

You have people that come and go that you know, I'm sure as well he came back one year and he's got toxic nodular goiter. I'm like, well how did this happen? He goes, well, I was low and I died.

Hard to find out. Well, I took this high dose. So he developed this problem by taking a high dose of iodine based on

the false understanding of a test that was given.

I'm like, oh, wow. That's that's how this is about like 2001 or so. And that was how that whole world first really hit my radar. Wow. Yeah. And how would people know if they're getting enough if they're not getting enough?

Is it testing. Is it give us some tips on like every day. Kind of a general. General answer is the testing sucks. Right. Iodine is something that's so chemically reactive it's not stable.

And it's also different in different parts of your body, like we said before. So there's a lot of tests that are used in epidemiologic research. They want to know how much 18 the people are getting in Denmark, for example, you can do a lot of different common tests and answer that question when you're looking at populations.

But when you go down to individuals, the murkiness of the data amplifies so much. They've done many studies saying how many times you have to test one person to average them all out to get an accurate level.

So for urinary tract levels, it's at least 200 or more tests. So yeah, if you want to be within like 90% accuracy. Now blood tests are really popular.

There's really not a relationship between Ida and your blood and the nutritional status of iodine. It's a useful test in some cases, too, where someone's given a really high dose most commonly either in contrast agents for imaging or in a medicine called amiodarone.

And those are case it to where might be stored in the body for months and months. So when you've got so much your kidneys can't clear it, then your blood levels get really high and you can see that there's also kidney damage there.

But barring either you're really high like that and you're totally toxic, or you're normal. But between toxic and normal, the blood release, there's nothing.

Wow. And so the reality is it sounds like, you know, from what this, this conversation, but also, you know, your book. The reality is that I think people maybe don't realize is we've been propagate this idea that we're all walking around iodine deficient, but we kind of aren't.

We're not now, I don't deficiency. It can happen. It is possible. And there are actually been seven documented cases of that in the last 40 years in the United States.

Oh goodness, not many. That's not a common problem. And the comment, actually, I, I was the one who diagnosed one of those seven cases.

Reversing Thyroid Conditions by Lowering Iodine

This was a young man who had gone to a motivation and speakers event, and he was under the impression that the healthiest thing he could do is go to not only just all raw vegetables, but pretty much all raw cruciferous vegetables.

So he consumed almost nothing but raw broccoli in a blender, like like three, 4 pounds a day for about four months. That was pretty much his diet. Now, of course, he lost a lot of weight when he was not.

Not in a good way. But his thyroid swelled up and he was iodine deficient. He was consuming really no sources of that. And the sad thing is that foods like cruciferous vegetables, they really don't hurt your thyroid unless that's all you eat.

And it's like 3 pounds a day and it's raw, right? Any anything in extremes. Yeah. So I told him, don't do that. You know, you're eating healthy diet and eat a big range of foods and you don't need supplements.

And so we followed up a few months later and read did his ultrasound read his ten. He was fine, you know. So yeah, those those cases have happened. But unless you're consuming almost only raw cruciferous vegetables, you're really not at risk for that as an adult.

And so tell me, I'm sure you know the exact stat. Like what is the rates of goiter due to low iodine at this point in our in our country for example. You know, it's great that you parse that question into two things.

The rate of goiter is due to low iodine. You know, it's thought to be pretty negligible. So the rate of goiter somewhere around 5% in adults. And a lot of cases, there's not a clear reason why, you know, they don't have another version of thyroid disease.

Some cases they do in population. There's a loose correlation between tobacco use, alcohol intake, body weight and goiter. But there's a lot of people that have no health problems and no big risks.

And they just randomly get a goiter so that happens in areas of endemic iodine deficiency. It's higher in pediatric groups but still not radically different in adults.

Okay. Wow. Interesting. Super interesting I, I want to change topics a little bit to something I've heard you talk about kind of recently that I it's like phase two of this conversation is also another question that I get from my people all the time.

And I want to touch on the the ability to reverse thyroid conditions. You know, I want to have that conversation with you because you're kind of the source that I would trust more than anyone else.

I'm so glad you asked that, because this is the most exciting topic. Yeah, I can tell you've been excited about it lately. I've been tuning in, I love it.

Well and my evolution was that I guess just to correlate with iodine was that yeah, the body needs it. No one really runs out. So what? And then oh well, you can get way too much and then oh wow.

This can be an opportunity to reverse the problem. So yeah. And if you would ask me that same question a decade ago, I would have been much more pessimistic about that whole process.

I had seen a lot of folks who'd needed treatment for a long time or had been struggling in various ways. And, you know, I thought that they could certainly improve their lot by managing things well.

But as far as fully reversing, I was less optimistic. But yeah, most, most can. And there have been some pretty good studies about this. One of the ones, for example, had people whose average TSH scores were about 14 and they were, you know, overtly hypothyroid.

T4 was, well below range. Many of them were in the 50 to 200 range for their TSH levels. All of them had clear signs of thyroid autoimmunity. Now, the curious thing was that they managed to find a population like that that had had levels like this for about four years on average, that were all unmedicated.

So that was curious. So yeah, they weren't they weren't medicated. They'd been like that for about four years. And I don't know why no one did anything.

But anyway that's that's an aside. So it wasn't that this was a one time weird fluke reading, which can sometimes say they've been statically bad for many, many years.

And the only intervention they had them do was get to a really low iodine target and within. You are kidding. No. Within three months the number was 78.3%, had perfectly normal thyroid function and that that's you're.

Blowing my mind. Well, that by itself is great, but it gets better. Keep keep going. Like wait there's more. So so yeah. So somewhere around 22% weren't in that happy group.

Right. Well of them a big chunk of them simply wasn't compliant. You know, they did some follow up and they just really you know, you got to play to win.

That's what the lottery tells you. And they weren't playing. Another big chunk of them had those really severely, outlandishly high scores. They weren't normal in three months, but they were close.

They were radically improving. So if you reword it and reanalyze the data and say of those who were compliant, how many fully reversed or improved significantly, it was 97%.

Wow. I'm going to have to toy with this in my own clinical practice and just gather some data, because that is fascinating, you know, absolutely life changing and fascinating and did antibodies change?

Were some of these people not, you know, not Hashimoto's or were they all basically presumed Hashimoto's or a huge chunk of. Them had measurable antibodies? They did come down.

The funny thing is that there's a really loose correlation between antibodies and thyroid function. You know, they having them high doesn't always correlate with the gland shutting down.

And the gland getting better doesn't always correlate with antibodies. Improving the antibodies do affect health in other ways. And no matter where your thyroid levels are, antibodies can cause big risks and big symptoms. So they're super important.

But the odd thing is they're really not as tightly tied into thyroid function as people often expect. Well, and these people in the study clinically, did they improve to like did they feel better or they their thyroid symptoms went away?

Obviously. Yeah. There's been about half a dozen studies showing pretty similar results. The worst the worst of the studies showed about a 60% improvement rate.

But that's, that's about but but yeah, they've all shown the majority of people have been able to reverse in the course of a few months. That's the higher percentage of people than people feel.

Well on levothyroxine, which is like the standard of care. So a win is a win. I'd say. Yeah, yeah. And a big thing there is like so many people, there's also a really loose correlation between symptoms and thyroid levels.

Even when someone's overtly hypothermic. Right. And definitely when there's subclinical hypothyroid I, we could talk numbers some of the time about how how loose that correlation is.

But many have these signs of early hypothyroidism. And yeah, that's not really the cause of the symptoms.

Where to Learn More and Final Takeaways

And so that's why pushing the numbers around is inconsistent for helping the symptoms. Fascinating. And I'm so curious when you started out well how did you start out digging into this iodine research so deeply?

Because I know that when you research a topic, you uncover literally every study out there. Tell me what turned your attention towards this? Well, the first one was that gentleman that I told you about before.

Then I was aware of the fact that some were talking about using in high amounts, but never really got too much of my attention. But when he did, the gentleman, there's one, one group of papers that were called the Iodine Project.

Collectively, they're published in a non peer reviewed medical journal. And there were a series of articles were put out. That's kind of what launched the whole mega dose iodine craze.

The gentleman who started that, he was a nice man. He's no longer with us. He passed away. I talked to him personally at length many times, and he was gracious.

He sent me all of his writings. I read everything, I read all of his citations. I read the citations from those, basically. And the story that it told was a plausible story, and it was internally consistent, but it just didn't sync with this massive century's worth of evidence and information.

We had about 18 requirements, so that's what got it going for me. Interesting. And there are so many studies outside of that set of papers. Right. But so many peer reviewed studies and.

Papers wasn't really studies. It was right ideas that were kind of self-referential, and it was put into a non peer reviewed book, but it really wasn't studies itself.

Totally. And there are so many studies available for, you know, reading and review that align with what you find, you know, fascinating. Well, thank you for this conversation.

I'm literally going to read listen to it myself because it was incredibly enlightening as all of our conversations always are. Tell people where they can find you, what you have going on.

Any other tidbits that you can share? So that people can follow up and keep learning from you? Sure. Doctor Allen Christiansen at Dr. Allen Christiansen, social media Doctor Allen, Doctor christiansen.com main website.

Easy to find it. Plug my name and you'll find me. That's pretty simple. And yeah, always putting out new content and always doing free masterclasses about learning about how to make sense of thyroid labs, how to find your iodine status, things along those lines.

So tons of sensory stuff out there. And the main message is just that, you know, don't ever let go of hope. And don't ever settle for something less than your best health.

You don't care what your diagnosis is, but especially if it's a thyroid diagnosis. There's so many good people out there like McCall and like others who are here on this event that can help guide you.

So yeah, never, never settle for something less than your very best again. Yeah, that's my motto. You know, there's no reason to still have thyroid symptoms.

And that's not the message so many people get. Also, you had shared with us to invisible iodine.com is a great place for people to head to and learn more as well.

So thank you. Yeah, great docu series, totally free talks all about the whole story and more of the hidden sources and how this all works and better details.

And I just put off right now. I love it. Well, thank you, Doctor Christiansen. I so appreciate your time and your wisdom and your research and your knowledge and thanks for tuning in, everyone.

Thanks again for having me.