Zinc, Retina Health, and Oxidative Stress

Zinc is also required for the activity of the retinal dehydrogenase, which is an enzyme that converts vitamin A into retinol, which is essential for rhodopsin, the visual pigment that lets us see in dim light.

But zinc also stabilizes cell membranes and is a cofactor for superoxide dismutase, which protects retinal tissue from oxidative stress. And what we see here in terms of leaky gut is there's an extremely high oxidative burden, which really damages the mitochondria.

Closing that circle on zinc, it's necessary for the transport of vitamin A from the liver to the retina, and without adequate zinc, that can't reach the eye, and now you have macular degeneration.

Welcome to the IQ Podcast. I'm Dr. Ronni Banek, here to help you boost your IQ with powerful insights that connect your eyes, your brain, and your whole body wellness.

Hello, everyone, and welcome to another episode of the IQ podcast. I'm your host, Dr. Rani Banik, America's integrative ophthalmologist, and I'm so excited to bring you insights into eye health, brain health, and overall wellness in this podcast.

And the goal is to help you raise your IQ, your awareness of all these different modalities we can use to improve our health.

Introduction to the IQ Podcast and Dr. Keeley

Today, I'm so excited to welcome my special guest, Dr. Daniel Keeley. Welcome, Dr. Keeley, to the IQ podcast. Thank you for having me. It's a pleasure to meet you.

Absolutely. We're so pleased to have you here. So for our guest, let me give you a little introduction to Dr. Keeley. So Dr. Daniel Keeley is a distinguished healthcare professional specializing in integrative and functional medicine, and he has a mission to reverse chronic disease and optimize human health through a root cause approach.

Dr. Keeley is the founder of TBD Fitness, a holistic wellness clinic based in Elk Grove Village, Illinois, and he serves patients both locally and across the country.

So Dr. Keeley, you have an interesting background that I would love for you to share with our audience. I know you didn't start off in the healthcare profession, so tell us about what you were doing before and how you came to become an integrative and functional medicine provider.

Yes, my story is unique in the sense it's very much similar to many of my patients' stories, but let's go back even as a kid. So I played soccer, that was my sport, and I ended up playing at a very high level where I was playing soccer at Northwestern.

So D1 athlete, and then I went to go play in Europe thereafter. When my career was kind of cut short to repeated hamstring tears, I wish I knew then what I know now how to preserve that.

That's when I decided to pursue the medical realm. I wanted to pursue medicine from a lens of holistic health and what now we term root cause medicine.

But in college is when I saw my own. health begin to deteriorate. I suffered from a lot of debilitating gut issues,

which persevered for over a decade.

And much like many of our patients, we begin to abnormalize the normal. And so it was met with a lot of frequent loose bowel movements, constant bloating and indigestion, frequent sensitivities to different foods, obviously that couples with sleep issues and hormonal issues, energy issues.

From Athlete to Functional Medicine Provider

I knew that I had to figure this out on my own because when I went to Mayo Clinic, which at the time I think, and maybe still today certainly is, touted as kind of the zenith of our medical system, they treated me with the suggestion of Imodium or Pepto-Bismol to be taken three times a day for 12 weeks and they sent me on my way.

So I saw very quickly that treating symptoms was never really going to discern how to correct the the awfulness of how I was feeling. So when I begin to practice functional medicine, I saw right away that I had a very high level of dysbiosis and parasites.

And so I saw the power of functional integrative testing to be able to undo a lot of these underlying symptoms and thus resolve my own personal health issues.

So in this journey, as you were researching, trying to figure out what was really going on, what was the root cause of a lot of your GI issues, did you try to do this on your own or did you work with a provider that you had found who could help guide you through this process?

Both. So early on, as I mentioned, I went to the Mayo Clinic. And so certainly I was seeking out providers who I thought to be the best in class. And going through medical school, I realized that, OK, well, there's more to the pieces of this puzzle.

And there's likely more that we can do from a testing standpoint to discern what's driving this. And so how I was built is I always wanted to be the best in terms of when I was playing, I always wanted to be the best on the field, have kind of the best outcomes to help my team win.

And during medical school, I was also seeking out providers who I thought were doing what I considered to be best in class. Early on, I developed relationships with mentors who were able to teach me their sage and wisdom, working with their patient population for decades.

And so my strategy was to try to kind of fly all over the US to learn off of some of these absolutely brilliant docs within all specialties, MDs, DO, DCNDs.

and then distill what I could and take that back into my own practice both personally and then to increase the likelihood of success both in terms of efficacy but also how quickly we can see our patients resolve their specific issues.

Your story is so inspirational of, you know, so many providers like us who have discovered integrative and functional medicine and now use those benefits not only for our own health and then we apply them to our patients.

So it seems like you started to apply some of these principles to feel better, I would assume. and started to use this approach of whole body wellness for your patients.

Can you give an example of a patient who, similar to you, maybe had some kind of undiagnosed entity and then that you helped to walk through this process of root cause medicine and then improve their overall health?

I mean, it's a laundry list. Let me think maybe one that just came into the office the other day. Many of my patients, unfortunately, more fortunately, they've seen many functional medicine practitioners, usually three, four, sometimes five.

And I thought kind of functional medicine was kind of the creme de la creme. It was medicine evolving into trying to discern what someone is going through by doing a lot of testing in some degree, certainly the body has patterns, right?

And so sometimes we don't have to test, but I like my philosophy is test, don't guess to discern what someone's going through and then treat. And I can be hypertarget with treatment and I can help someone heal faster and safer.

So one lady comes to us and she can barely, barely walk, not in terms of motor dysfunction, but in terms of her energy was non-existent. She was super reactive to the light.

She was super reactive to the noise when she had walked in.

A Patient Case: Stool Testing and GI Cleanup

I mean, it was like a walking zombie and she was diagnosed with fibromyalgia. So I suggested it immediately and she'd seen many other practitioners similar in the functional medicine world.

And that's when I saw quickly, perhaps we're not all alike, but the principle here is not to inflate any sort of ego. The principle is just, I want to know what a patient has done before, because I don't want to repeat the same things if they already have, you know, a plethora of testing done.

But what's often overlooked I find is just a simple comprehensive stool test. And so that to me was the missing gap. No one was looking at her microbial disposition.

So we did a stool test and there were two specific strains of bacteria that were, I think it was like 20 times the healthy range. I've never seen it this high before.

and left untreated, that could be potentially fatal. And so she was struggling simply because of this. And once we did a very simple but aggressive GI cleanup, I mean, it was the next time I saw her in my office within eight weeks, full of energy, down 13 pounds, which she expressed that women too often, I don't know if you can relate to this, but they often come in and they want to fit in a certain dress.

And while for me, I'm less concerned about someone's, if it can fit in the dress, I'm more concerned if I clean up the internal chemistry, the body's going to start to burn fat for fuel as intended.

And so as a consequence, you'll begin to look better. But my goal is let's clean up the GI and let's get these these dysbiotic species to healthy ranges and you're going to definitely feel better.

And this story is reflective of so many patients that a simple stool test can discern again very, very quickly on how you can heal hormonal imbalances, issues with brain fog, fatigue, sleep, memory, certainly metabolic profiles, even obviously metabolic composition where women say, you know, they're stuck and they're plateauing, they can't lose any weight.

This is relatively easy to fix and it's just from doing some testing and then providing the right input that has been impaired for too long. Well, thank you for sharing that story.

You know, I can definitely relate as a provider where I've seen many patients who've seen other eye care providers and they haven't been getting better, whether it's eye inflammation, whether it's macular degeneration that's progressing.

And we need to look deeper. And oftentimes I do look at the gut because there is this connection between the gut and eye health. And just like there's got the gut-brain connection, the gut-skin connection, there's the gut-eye connection.

And definitely, it's definitely worth investigating. I wanted to ask you though, Dr. Akile, you know, doing something like a stool test, a comprehensive diagnostic panel.

Sometimes patients don't have access, whether it be financial limitations or they can't just order. Well, I guess you can order some of these tests commercially now, but you need to have a provider interpret it for you.

What are your thoughts about people kind of assuming that they have gut dysbiosis and going ahead and addressing that without doing the testing? I mean, I'm also a believer in tests, don't guess, but for those patients who don't have access, what are your thoughts about that?

Yeah, so as I alluded to before, the body leaves patterns, right? A stool test allows me to be hypertargeting my treatment. I've been doing this for almost a decade now where I'm usually, I can usually shoot bullseyes blindly, right?

Only because I've seen so many patterns. So while the story is unique to the patient, it's not unique to us and our team. And so testing isn't always where we start.

We can certainly get people better just by incorporating digestive enzymes as an example. So say someone comes in with bloating, digestion, flatulence, obviously there's digestive issues.

A simple digestive enzyme is going to help a simple HCl, hydrochloric acid. It's the stomach acid that we produce naturally, getting someone perhaps on hydrochloric acid, which the parietal cells oftentimes as we age degrade and we secrete less.

Why Testing Matters in Gut Health

stomach acid and so this is an issue with our aging population but this is also an issue with stress because is does the issue happen in the gut or does it happen in the hypothalamus and now the vagus nerve doesn't send the right signal to start the digestive process that's where a test can help but certainly if we balance the HPA axis, we modulate the stress response, we buffer against perhaps excessive cortisol, cortisol resistance, we provide some stomach support, the patients already begin to feel better, but this is often band-aids.

So until we do a test, it's difficult to determine, okay, what is crippling this system? What's driving this? So when a patient maybe doesn't have enough resources, I explain to them why this is important.

Or I just suggest, okay, here, in the specific representation that you're coming in with, let's start with this. My suspicions will probably get you 85 to 95% better, sometimes without even a test.

And then, you know, if there are certain unresolved symptoms, let's kind of do a test and see where else we have to account for that perhaps was the missing link.

Usually patients come with a blood test. Now, these tests are usually, let me say, I don't want to say inconclusive, but they're not full. They're not complete.

But within a blood test, there's a lot that can already be reflective of what's going on in certain holes that we need to plug in because the blood doesn't lie in the blood test itself.

Power is not in the test, but the power is in the analysis. So you're right. It's not necessarily that the test is important. It's the interpretation.

And within a blood test alone, I think that many providers often overlook the power of a CDC with differential or what your analysis could provide. Lipid profile is okay, but again, other markers may be more relevant to insulin resistance like homocysteine or A1C or perhaps tying it with uric acid levels.

There's a lot that can already be reversed by looking just at a comprehensive blood test that some patients

sometimes already have. So the goal isn't to just do a lot more testing.

The goal is to see, okay, how can we start? How can we be super lean but yet achieve the highest level of outcome? Absolutely. That all resonates very much so with my approach as well.

Talking about the gut, I wanted to just get your opinions on leaky gut because I'm sure it's something that you see very often in your practice. It's something that I see very often in my ophthalmology practice because as I was saying, there's the gut eye axis, but there's also leaky gut syndrome.

There's leaky eye syndrome. Sometimes when people do have some form of leaky eye syndrome, I look at the gut. And so what are your kind of big pillars when you're thinking about leaky gut and what are some of the main things you suggest?

I know I'm kind of generalizing, but what are some of the main things that you suggest patients do if you suspect that they have leaky gut? So I very much look forward to having you on my podcast to talk about all things eye related, but let's unpack leaky gut or what's colloquially now known as leaky gut or intestinal permeability.

And so that's dysfunction of your GI barrier. So the epithelial lining, which is one, cellular ethics, which kind of protects you from the outside world.

In our modern era, with exposure to fungicide, pesticide, herbicide, you name it side, which paralyzes insects, so too does it paralyze our gut lining.

And that doesn't even now take into account all the plastics and phthalates, POBs, PCBs, VOCs. I mean, there's a myriad or deluge of different toxins that we're now exposed to that we never evolved with.

And so it's very difficult for our gut lining or the tight junctions to maintain their integrity because of this high exposure. So what happens is tight junctions open and you want to think of that as kind of a fence.

writer that the gate to your home as those open because of these poisons that kind of cripple the glue that keeps them together you now have things get into the the bloodstream which otherwise shouldn't be there and what resides there is your immune system to protect you how does the immune system fight well with inflammation.

Now, is inflammation bad? No, not necessarily. It keeps you alive. When you cut yourself, a neutrophil is ushered to the scene. That's kind of the white-yellow pus that begins to develop to kind of help heal and seal the wound.

Leaky Gut, Microbiome, and Eye Health

And so too happens with your secretory IGA, which is right at that gut lining to start amounting an attack. That's like you're the police officer that comes to the scene with maybe some fire trucks.

But what happens over time is kind of this what I call a pathogen party can begin to proliferate because the tight junctions are open. You have things continually leaking through.

This now allows pathogens to swim everywhere into the body and particularly the eyes. So it's interesting when you say leaky eye, I've never heard that before, but it makes sense because leaky gut, leaky brain, leaky gut, leaky lungs, leaky gut, leaky heart.

And so the story continues to unfold. We know that each organ has its own microbiome, the eye included. Let's look at the link between the microbiome, perhaps, and the mitochondria.

Eyes, especially in the retina, are among the most energy-demanding tissue, I think, in the human body. and therefore extremely rich in mitochondria, perhaps maybe second to brain and liver and heart naturally.

There's photoreceptor cells, I think, rods and cones, which contain thousands, if you will, of mitochondria. Why

does this become relevant? Because the mitochondria supply energy needed for photo transduction or converting light into neural signals.

The retina, especially the macula, contains some of the body's highest zinc concentration. So going back to secretory IgA that we mentioned or the immune defense, it's very zinc dependent, but zinc is also required for the activity of the retinal dehydrogenase, which is an enzyme that converts vitamin A into retinol.

which is essential for rhodopsin, the visual pigment that lets us see in dim light. But zinc also stabilizes cell membranes and is a cofactor for superoxide dismutase, which protects retinal tissue from oxidative stress.

And what we see here in terms of leaky gut is there's an extremely high oxidative burden, which really damages the mitochondria. But closing that circle on zinc, it's necessary the transport of vitamin A from the liver to the retina or via retinal binding protein.

And without adequate zinc, that can't reach the eye and now you have macular degeneration over time. How does this connect to the microbiome is that it's believed that mitochondria have evolved from proteobacteria.

So our gut produces compounds that regulate mitochondrial activity and something like short chain fatty acids as an example, which is a process of fermentation from our bacteria, hopefully our healthy bacteria, which fuels colonocytes, which then helps rebuild the wall of the gut lining.

And what happens is when that's open again, there's dysbiosis that happens one step before that and gram-negative bacteria shed their lining, which are lipopolysaccharides or this kind of endotoxin, which then begins to trigger mitochondrial dysfunction through inflammation, through reactive oxygen species.

And now you have problems that should be contained in the gut and then get out and into the periphery. And so that is super damaging to the eyes. And so 90% of our secretory IgA, as I expressed, is found in gut-associated lymphoid tissue, or GALT.

The gut microbrion connects to the ocular biome, where we find staphylococcus in the eye, we find corneobacterium, we find proprinobacterium, and other such streptococcus species.

These microbes can help train the local immune system to respond to barrier function. And ideally, the goal is to maintain this barrier function so that we prevent pathogens that can cause infection like conjunctivitis or keratitis.

So there's the coronabacterium, which stimulates a mild immune response, which helps recruit neutrophils to further protect this against Candida or Pseudomonas.

And so this dysbiosis is what I often see that starts in the gut, gets into the eye, and now we have big problems with vision. Yeah. I love how you've connected the dots here.

I mean, it's such a complex web, you know, the gut-eye connection and then bringing in inflammation and also oxidative stress. And I'm also impressed by your knowledge of phototransduction.

I'm quite impressed by that, Dr. Kuehle, as a non-eye care provider. I'm going to touch upon a few things that you mentioned, but we're going to take a very short break to hear from one of our sponsors, and then we will be right back with more on the IQ Podcast, so stay tuned.

Did you know that your gut health can play a crucial role in maintaining your eye health? Inside your gut, there is a bustling community of microorganisms known as the gut microbiome.

When this community is balanced, your entire body, including your eyes, can benefit. Research shows that imbalances in your gut microbiome called gut dysbiosis can contribute to eye conditions like uveitis, dry eye syndrome, age-related macular degeneration and glaucoma.

To help you support your gut and your vision, America's integrative neuro-ophthalmologist, Dr. Ronnie Bonik, developed Balance, a potent probiotic. Balance provides 10 highly researched strains carefully selected for gut and vision health.

Balance's moisture-resistant specially-lined packaging ensures strain viability. With Balance, you can promote a healthy gut microbiome. This may help reduce the risk of eye conditions linked to gut dysbiosis.

Support your gut and support your eyes with Balance. Welcome back, everyone, to the IQ podcast. We are speaking today with Dr. Daniel Kiley, who is an expert in integrative and functional medicine.

And we've been talking a lot about gut health and its relationship to eye health. And one thing I wanted to ask you, Dr. Kiley, is, you know, this interplay between leaky gut and the immune system, the dominoes that fall, can in some cases lead to autoimmune disease.

And we know that the eye is very vulnerable to various types of autoimmune conditions, whether that be multiple sclerosis or lupus or Sjögren's disease or ulcerative colitis.

So in your patients with autoimmune diseases, have you seen a lot of eye issues related to that? And if so, when you treat the autoimmune aspect of things, how do their eye issues do?

Yeah. So autoimmune to me is a diagnosis of seven years. It doesn't happen overnight, but the problem is that our patients only raise their hand when there's physical manifestation of pain.

So let's look at eye deterioration as an example. Usually, hopefully if a patient is taking care of themselves, they're going to stand up when they all of a sudden see some sort of vision impairment, let's say degeneration or pain in the eye.

that manifestation is years sometimes in the making, it doesn't happen overnight. And so the chronic nature of autoimmune, that cascade happened long time ago.

Autoimmune Disease, Barrier Dysfunction, and Prevention

And it often starts with, again, immune barrier dysfunction, whether that's in the oral fairings, in the sinus cavity, that's somewhere in the esophagus, that's somewhere in the skin, in the eye, in the gut.

So there's barrier dysfunction, which then leads to autoimmune when it goes untreated for too long. So in our patients, when you mentioned, so Sjogren is an example of, you know, it's a, it represents his dry mouth or dry eyes, if you will, lupus or MS, autoimmune in the brain, Crohn's colitis, autoimmune in the GI.

Usually the body is operating what I term to be at a 40% deficit, if not greater. So what does that mean is I have my patients focus on five different things.

You have to eat well, sleep well, move well, talk well, and poop well, and you're gonna feel well. But often enough, one or two of those pillars are often breached, whether it's sleep, because we're not prioritizing it, or our nutrition isn't as clean as it needs to be.

So now if you knock out those two pillars, you're at 60%, the body begins to manifest physical symptoms, of pain or ID generation. And then we raise our hands and we say, okay, it's probably time to go to the doc or they go see you as an eye doc.

And they say, Hey, you know, my, my vision is deteriorating. The good part with vision is we typically act sooner because we, we notice symptoms sooner often enough.

But there are issues with autoimmune where it's very much silent for so long until the inflammatory cascade is so high that the body is now fighting against its own tissue and damaging organs.

And so that's where pain begins to manifest even higher or symptoms begin to become more aggressive. The good part about vision loss, people are more receptive, I think, to do something earlier on.

So I myself, my partner who did LASIK or myself when I did PRK. So there's corrective options, but unfortunately we practice reactive care where we'll do things when we feel it rather than preventative care, which is again, can you do this on a daily basis?

Eat right, sleep right, move right, talk right, poop right. And if you're mastering that, the simple, simple things you can do foundationally, often enough, which are free, You can feel right.

Yeah. No, I really love what you said about changing the narrative and making it preventative, like a focus on preventative care rather than reactive care.

And that's really been the major issue in eye care is that we wait for things to happen. wait for macular degeneration to develop. And then once it gets to a certain stage, then we treat it.

But it just doesn't make sense. Why wait for something to happen? It's happening slowly, as you said. For macular degeneration, it probably takes more than seven years, 10 years, 15 years, 20 years to get to the point where people actually have vision loss.

So there's a window of opportunity to intervene and make some changes. And as you said, I love what you said about those five pillars. So much of it is within our control.

Yes, we have our genetics, we have our environmental risks, but so much of it is what we choose to put in our bodies, how we choose to sleep. And I'll add to what you said, I'm not sure how to fit it into your paradigm, but stress modulation is to modulate our stress levels.

We all have stress, and I've definitely seen people when people are stressed, that's when their eye issues act up. So preventative care is I wanted to ask you one more thing, Dr.

Killeher. I know our time is almost up and this has been such a fascinating discussion, but you also specialize in an area called nutrigenomics. And you were talking a little bit earlier about zinc.

So can you give us some background about nutrigenomics and how that may impact our diet, our nutrient absorption? Just give us an example maybe of how that could help someone to understand their health better and use diet and perhaps supplements from a more scientific base.

Yeah, that's such a relevant question. We're such at a beautiful place in time, almost an inflection point where modern medicine can become precision medicine.

So looking at our genes, we do a genetic test almost with everybody and prices keep coming down and things become more accessible. So I know we talked about testing and perhaps sometimes costs involved, but this allows us to what I term as precision medicine where we can see someone's holes in their biology or their predispositions and begin to plug those holes such that we can now customize your entire lifestyle program.

Nutrigenomics, MTHFR, and Personalized Eye Health

So, nutrigenetics is nothing more than the intersection of our genes and nutrition, and what nutrition or perhaps higher nutrient needs that you may have in order to optimize your biology.

Let's look at, as an example, glaucoma, which has afflicted my father, so this hits close to home. To me is nothing more than mitochondrial dysfunction.

That's a little bit reductionist. But if you look at retinol ganglion cells, they're highly energy dependent. And when we impair mitochondrial function, we reduce ATP that increases oxidative stress.

So you said stress to me that is certainly the elephant in the room. That's our modern lifestyle. I discuss this with our patients all the time is that here, especially in America, is we know how to press the gas pedal very well until we run out of gas.

And then we say, let's drink some more coffee and press it more. But looking at this oxidative stress burden and zinc as an example, we need more antioxidants.

So I see that in a genetic test, whether someone has a higher need for choline. Looking at when you mentioned zinc, and I tied this back into guacoma, there needs to be more vitamin C, more vitamin E, antioxidants, CoQ10, alpha-lipoic acid, glutathione.

So we can see as your master antioxidant, where are you at in production of glutathione? Do you have specific SNPs that are down-regulated? So you need a little bit more.

Do you have specific deletions? So how you can account for, again, holes in your biology and then plug these holes to optimize or prevent and hedge against some of these predispositions because our genes are not our destiny.

looking at glutathione pathways in particular, this is critical for detoxification and methylation. And if you're unable to neutralize the oxidative burden in the eye, well, this is how you're going to impair vision over time.

And so there's vascular and microcirculation that needs to be accounted for, neuroinflammation that needs to be accounted for. And I can see some of these risk factors within a simple genetic test.

And so doing this one test, that you only need to do once in your entire life, you can begin to plug, like I said, those holes, but you can also begin to see what's going on in your kids' biology, too, just from looking at yours, because our kids are an extension of ourselves and, you know, share genes with our parents.

And again, the component of nutrigenomics to me is this beautiful intersection of understanding what nutrient needs that you have a need for and begin to fill that gap.

Yeah, a great example would be, this is so common, would be an MTHFR variant, right? So we know that certain people have this variant of this gene that requires that they don't absorb certain types of folate and methylcopalamin properly, so then they need to have a methylated form.

And so that's important to know. I've definitely used that for patients. I also do a lot of migraines, so I definitely have looked at that, and I found that a lot of patients with migraine have variants in their MTHFR gene.

I don't know if you've seen something similar to that, but that's something like a thread that runs through a lot of my patients. That's one certainly that hits close to home because I see this as very endemic to the Italian population and myself, my father being from Italy.

So we have a 66, I believe, percent reduced capacity to methylate. And so obviously within phase two, there's glucuronidation, sulfation, acetylation.

Methylation is one component. But why this is so relevant because it looks at our ability to produce glutathione, again, our master antioxidant. And if we have an ability to do that, some precursors such as stated, so MT5FSO of methylated folate or a methylated B12.

These help with the conversion so that the body can take the raw ingredients, convert it to its active form, and now you don't have that missing link.

Our body's like an assembly line, and if there is dysfunction in any one of those compartments, well, you're going to have an impaired signal with a dysfunctional outcome.

And so, yeah, you nailed it on the head. Making sure that our patients are counting for these things is critical, and doing a genetic test is just making that process one step easier.

Fascinating. Is there a particular vendor that you prefer for when you order the Neutrogenomic testing? Neutrogenetic testing, I should say. You know, I want to give a shout out to the DNA company because I think they do things on a high level, but what I use is three by four and their team is absolutely astounding.

Do as well. I love their pathways and it's just so clear for patients to understand as well. Yeah. It's a wonder. And it's such a simple test also. It's a, you know, it's a swab.

Very easy to do. So easy, but provides such a level of actionable insight. Absolutely.

Where to Find Dr. Keeley and Closing Remarks

I've been actually talking to them about potentially putting together some eye markers specific to genetic variants for glaucoma and macular degeneration, including that.

So hopefully, that will be in the pipeline at some point in the future. Please, please, please, please. Yes. Well, Dr. Keeley, this has been such an enlightening discussion.

I've learned so much from you and it brings back, you know, all my studying for functional medicine, all those pathways. I mean, you just you're so eloquent in how you describe them and making very complex processes easy to understand.

So thank you for sharing your expertise. If anyone who is listening to the podcast wanted to reach out to you, I know that you do both in-person consultations as well as virtual.

How could they find you or find more about your work? Yes, Dr. Arani, thank you as well for having me as a guest. This has been very, very fruitful. I hope your patience and whoever listening took something positive away.

So you can find me. Our clinic is Total Body Diagnostics. We're right outside of Chicago. We also practice telehealth. So TBDfit.com, like Total Body Diagnostics, also the TBDfit podcast, which we're launching as well.

Love to connect with people, even if it's just kind of a positive review feedback, but we're here to provide guidance and education moreover than anything and help our patients, much like you do, just receive optimal health, which I think everyone deserves.

Absolutely. So beautifully said. And we will include those links in the show notes. So you will have easy access to Dr. Keely. Well, thank you again for spending this time with us.

I know your schedule is very busy, so we really appreciate it. And I look forward to seeing the rest of you during our next episode on the IQ Podcast.

So stay tuned. Thank you for tuning in to the IQ Podcast. I hope you enjoyed today's episode and learned something new to help you boost your IQ. Leave us a review and share the podcast with your family and friends.

Stay connected with me for more eye-opening insights on eye health, nutrition, and lifestyle. Until next time, keep your vision clear and your IQ sharp.