



Episode 427: Hyperbaric Oxygen Therapy (HBOT)  
and Health Optimization Medicine  
With Dr. Scott Sherr

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This episode is brought to you by Wellnesse. That's Wellnesse with an E on the end. We make personal care products that go above and beyond just non-toxic to actually be beneficial for you from the outside in. I realized years ago that even some of my most naturally minded friends and family members who made an effort to eat organic food and be really cognizant of what they brought into their homes were still using certain personal care products, mainly hair care and oral care. And the reason was, they weren't willing to sacrifice how they looked and felt just to use natural products. And none of the natural products they were finding really lived up to the conventional products as far as how effective they were. So, I resolved to change this and realized I had things that I've been making in my kitchen for years that worked just as well and that I could share with other families, and thus Wellnesse was born. You've probably heard that what goes on our body gets into our body and that many of the chemicals we encounter end up in our bloodstream. To me, this means non-toxic and safe should be the absolute bare minimum baseline for any products that are in our lives. But I wanted to take it a step further. I wanted it to use this to our advantage to actually put beneficial ingredients in our hair care, toothpaste, personal care products so that we could benefit our body from the outside in. Why not use that wonderful skin barrier to our advantage?

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Katie: Hello, and welcome to the "Wellness Mama" podcast. I'm Katie from [wellnessmama.com](https://wellnessmama.com) and [wellnesse.com](https://wellnesse.com). That's Wellnesse with an E on the end, my new line of personal care products. This episode is all about hyperbaric oxygen therapy and other forms of health optimization that can be synergistic with it. I'm here with Dr. Scott Sherr, who's a board-certified internal medicine physician, certified in hyperbaric oxygen therapy and in health optimization medicine. He's based currently in the Bay Area of California, but he works worldwide in education and advocacy with high-level athletes, high-level entrepreneurs, biohackers, and patients with severe medical conditions.

He's one of the foremost experts in the world on hyperbaric oxygen therapy and how it is used in a medical setting. And now people are using it for home uses as well. He also is involved with a company called

Troscriptions, which we talk about at the end of this episode. And links to all of those things are in the show notes at [wellnessmama.fm](http://wellnessmama.fm). If you're not familiar with hyperbaric oxygen therapy, you're going to get a deep dive into it today. But it is a fascinating therapy. It's not new, but it's being used for a lot of new uses in medicine right now and we really delve into those. So, without further ado, let's go and join Dr. Scott. Dr. Scott, welcome. Thanks for being here.

Dr. Sherr: My pleasure, Katie. Thank you for having me.

Katie: I'm excited to chat with you because you are an expert in a topic that I know a little bit about, but not a ton, I have experienced, and I think it has a lot of broad implications and can potentially help a lot of my listeners today, and that is hyperbaric oxygen therapy. So, to start broad and then dial down from there, can you walk us through and, kind of, define the terms, what is that and what is the effect on the body?

Dr. Sherr: Sure. So hyperbaric oxygen therapy is a pretty easy definition. And then we'll get into the details of it. It's defined as the combination of an increased atmospheric pressurized environment plus increased inspired oxygen. And the combination of the two drives a significant amount more oxygen into circulation. And that's where the magic happens. But to describe pressure first, so typically, most of us live at sea level. And that is defined in my terms as 1 ATA. But we'll get back to that. And the more pressure you're under, the more pressure we can describe in the chamber. And it's very simple, really. We actually simulate the pressure you could feel under a certain amount of seawater in the chamber because water is quite heavy. If you pick up a bucket of water and you tried to carry it around, we know how heavy it is. But when you're swimming in it, you're weightless, and so you don't feel that pressure. But if you're under 10, 20, 30 feet of seawater, all that water is actually exerting a significant pressure on your body. And we are actually simulating that pressure in the chamber.

And the second thing we're doing is increasing the amount of oxygen that you breathe. Typically, there is 21% oxygen at sea level at that one at 1 ATA. And in a hyperbaric environment, we can increase the amount of oxygen in the environment up to 100%. And just so that your listeners know, the rest of the air at sea level that's not oxygen is mostly nitrogen. And if you live in a city environment, you're gonna have the pollutants like carbon monoxide, etc. And so, the beauty of the combination of these two things, Katie, is that when you combine an increased amount of oxygen with an increased amount of pressure, you can drive more oxygen in circulation, as I mentioned.

But there's something else to describe here, and that's the red blood cell. Typically, oxygen is carried on our red blood cells. Red blood cells are the main carrying molecule for oxygen in our body, and they carry it by having a molecule on them themselves called hemoglobin. And hemoglobin, there's actually 250,000...sorry, 250 million hemoglobin molecules per red blood cell. And every hemoglobin molecule can carry 4 oxygen molecules. And so when you take a deep breath in or any breath in, all that oxygen that you're breathing, even the 21% only in the air that you're breathing, which sounds like a little bit for a lot of people with that, how much is in there, gets actually bound to the red blood cells and then because of the calculation, that's 1 billion

oxygen molecules per red blood cell. And most of us do very well just with that amount of oxygen that's being carried. And that's a lot of oxygen, as you can imagine.

But there is another way to get more oxygen circulation. Now, you can increase the number of red blood cells you have in circulation, of course. That's done by altitude training or by taking a drug called EPO, which is one of those drugs that you've probably heard, like Lance Armstrong and other cyclists have used to increase their red blood cell mass because the more red blood cells you have, the more oxygen you can carry. And oxygen-carrying capacity is a big deal when it comes to almost anything but especially elite athletes, and sports, and endurance, etc. But in a hyperbaric chamber, we're actually pressurizing you, simulating the pressure you would feel under a certain amount of seawater. And when you've done that, when you've pressurized this oxygen going in, not only does it pressurize that oxygen and get it on the red blood cells, but also gets it into the liquid or the plasma of your bloodstream. And that liquid plasma that you have always in your bloodstream has very little oxygen in it at sea level. And we can increase the amount of oxygen in sea level up to about 1200% or greater.

So you have liquid oxygen free-floating in your bloodstream along with the oxygen that's being carried on your red blood cells. So to, kind of, bring it all back here, you have an increased atmospheric pressure, combined with increased inspired oxygen that drives more oxygen circulation. And that leads to a significant amount of more oxygen that's floating around in the system to both work acutely, so immediately get oxygen to where it needs to go. And then over the long-term, create what we call an epigenetic shift on our DNA to manifest various genes or express various genes that are responsible for growth, for decreasing inflammation, and for overall optimizing the system.

Katie: That was such a succinct explanation. Thank you for that. And I guess I've been in a hyperbaric chamber a few times, and the pressure of it reminded me a little bit of when I've been diving, is it basically a similar idea, that idea of being underwater?

Dr. Sherr: Yes, exactly. So, hyperbaric therapy came around as a therapy first for treating the bends or decompression illness. Back in the 1880s when they were building bridges, they were actually describing something called the garaken bends, that's the longer word for it. But basically, these workers that were sunk down deep underneath the water, who were building the pylons, the bridges would get these symptoms when they came out from underneath the water, which they called the bends. These people would be bent over actually. It would cause neurologic symptoms mostly. And that's related to nitrogen buildup and actually nitrogen gases. But the short story is that hyperbaric therapy was developed to reverse decompression illness. And so, what they would do is they found a way to simulate the pressure you would feel under a certain amount of seawater. And by going into that pressurized environment, you can reverse decompression illness or the bends and reverse those nitrogen bubbles that had bubbled up as a result of coming out of pressure too quickly.

This is all related to gas, liquid pressure, temperature, all this physics stuff. One of them is called Boyle's law if anybody really cares. Another one is called Henry's law. And Henry's law is the one that I mostly focus on,

which is the idea that when you pressurize a system, the more of a gas that goes from a gaseous form to a liquid form, and then the opposite also occurs. So if you take pressure off a system, the more of that gas is gonna go from a liquid form to a gaseous form. And that's what's happening in decompression illness. But that same feeling of pressure in your ears, Katie, that you felt when you were diving, is the same feeling you actually have when you're in a hyperbaric environment as well.

Katie: Gotcha. Okay. So, I know that I've seen this used for a variety of different things. I personally experienced it with a friend who had advanced Lyme and was on a protocol with her doctor for helping resolve that. But I've also heard of hyperbaric being used for all kinds of different things, even just to, kind of, slow aging. Are there things that it is specifically studied for or what are the majority of people coming in for when they're doing hyperbaric?

Dr. Sherr: So, there's 14 indications that are currently insurance approved in the U.S. for hyperbaric therapy. And across the world, though, there's over 70 in Japan, China, and Russia. So there's actually a lot of great data out there for how hyperbaric therapy can help. And the way I like to think about this, Katie, is that there's basically, sort of, two...like, a fork in the road here, if you have an acute indication for hyperbaric therapy or if you have more of a long-term condition or a long-term goal. Most of the acute indications of hyperbaric therapy are protocols that don't actually take that long to see significant benefit in the chamber as opposed to the more long-term goals and the more chronic conditions, those can take longer to see these changes. And those, kind of, go back to those epigenetic shifts that I was describing.

And so, what happens in the acute infusion of oxygen, and even in the long-term in a different way, is basically five things. The first is that you're reversing low oxygen state. And so that's also called reversing hypoxia. So you're doing that immediately by infusing all this oxygen in circulation. So, if you can imagine, Katie, if you've had a stroke, a heart attack, if you've had an acute limb trauma, if you've had another type of trauma, if you've had a spinal cord injury, if you've had a traumatic brain injury, for example, you're going to have tissue that's at risk for dying because you've had this trauma to the tissue. And what hyperbaric therapy can do and actually has been studied across the world is reverse that low oxygen state. And so if you've had some of those conditions, hyperbaric therapy may help you and actually help you recover or potentially prevent you from dying. And that's been studied in research in traumatic brain injury, in stroke, in heart attack, preventing heart tissue from dying, etc. So that immediate infusion of oxygen has a huge impact on reversing low oxygen states.

And over the long-term, what hyperbaric therapy does is actually regrows blood vessels, and it does that by something called angiogenesis is the medical term for it. So it actually regrows and enhances the density of blood vessels in various areas of the body. That could be in our brain, that could be around our heart, and that can even be around our genital region for fertility-related reasons. And actually, hyperbaric therapy has been described, and actually researched in all of those categories, improving blood flow to the brain, improving blood flow around the heart, and so that improves endurance and something called VO2 max, and also increased improving erectile function in males. And that's actually how all...and my colleagues in Israel, that's how they get all the guys to sign up is by telling them about that. So, that's really the first thing that hyperbaric therapy does is really reverse hypoxia or low oxygen states.

The second thing it does is decrease inflammation and swelling. It does this immediately by actually decreasing swelling inside of tissues that's been damaged. And over the long-term, it actually creates this epigenetic shift where you have a downregulation of all these inflammatory markers, cytokines like TNF Alpha, and IL-1, IL-6, IL-8, and others. And basically, it's just meaning we're decreasing inflammation over the long-term. And that can be super important for people that have chronic inflammation, that have chronic brain inflammation, or other areas of their body that are inflamed. And also decreasing swelling is also, in the acute side of things, very important for people that have swelling like in your brain, for example. If you can decrease swelling in your brain, you could potentially save somebody's life. And the third thing hyperbaric therapy does is actually enhance the amount of stem cells that are released. It does so acutely by almost immediately once you get to the chamber, there's this creation of the stimulus to make more stem cells release. And over the long-term, it continues to do this. And stem cells are these baby cells in our body that can make any cell that we need to regenerate, to revitalize, to renew, etc.

The next thing that hyperbaric therapy does is actually creates this pressure stimulus. And as a result of this pressure inside the chamber, because remember, you're under atmospheric pressure here, you're actually improving blood flow to tissue and you're actually improving lymphatic flow outside of tissue or out of tissue. So you're enhancing the flow in and the flow out. And we think this is happening because of, sort of, localized factors related to structured water or the term maybe you've heard of called EZ water that was described by Gerald Pollack, a researcher in Washington State. And so as a result of this, you're getting more flow to tissue and getting more flow out.

The next thing hyperbaric therapy does, and I think this is the fifth thing, there might be more, this is the major...the fifth thing is that it actually kills bugs. And this is, kind of, going back to your friend, Katie, that you were mentioning, in Lyme disease. So, we actually see hyperbaric therapy being used for killing bugs that do not like high oxygen environments. Lyme is one, MRSA or MRSA is another, a lot of the anaerobic infections, so the infections that don't like high oxygen environments also are in this category. So we combine hyperbaric therapy with other treatments. This is actually the first way I saw hyperbaric therapy being used back in medical school was to treat something called necrotizing fasciitis, which is also known in common parlance as flesh-eating bacteria. So, no fun there, but significant benefits for these patients. So that's sums up the physiology of it, I think, pretty well.

Katie: Okay. So as far as mechanism goes, you explained that it's like a pressurized environment. And I know there are various different methods of achieving that. So, walk us through the different options because certainly, I've seen at-home ones. There's also...I've been to the more clinical hard-shelled one but, kind of, explain what the differences are between those.

Dr. Sherr: Sure. So, yeah, there are various chambers available. And the first ones invented were something called multiplace chambers. These are chambers where multiple people can get treated at the same time. They're made and capable to go into very deep pressures because they're treating divers and people that may have gone very deep underneath the water and have gotten decompression illness. These chambers can be

used for any pressure, but they're mostly used in academic facilities around the world. They're also used at diving locations around the world. So if you've been diving, a lot of these major diving locales have hyperbaric facilities close by in case people have gotten the bends.

What's also nice about these multiplace chambers is that you can get multiple people in there to be actually worked on. So you can actually do ICU-level care. And so, in one of my colleague's facilities in Israel, for example, they're doing COVID-related therapy and working on various protocols and investigational research looking at hyperbaric therapy for COVID, for example. And it's much easier in these environments. But on the other flip side of it, multiplace chambers can also be used for rehab and rehabilitation. So you can have an attendant in there that's working with people as they're getting hyperbaric therapy. And as a result of that, potentially having a significant benefit from previous research that's been done. The combination seems to be actually very effective. So that's the multiplace chamber.

Then there's what's called monoplace medical-grade chambers. And these chambers typically go to what's called 3 ATA. And that's the equivalent of 66 feet of seawater. And that's a very important marker, actually, for people because what I forgot to mention earlier is that when you can get to 66 feet of seawater or 3 ATA, you can diffuse or infuse so much oxygen into circulation that you no longer need red blood cells to actually perform your physiologic function. So that's a pretty amazing feat if you can imagine it, you don't actually need red blood cells because you can get so much oxygen circulation. And so these chambers go to 3 ATA, these monoplace chambers.

The most famous occupant of the monoplace chamber is actually...if you're, I think, born before 1985, this is what you're gonna ask me is if this chamber or if hyperbaric therapy is what Michael Jackson used? And the answer is yes, he actually did use hyperbaric therapy to heal himself from burns that he sustained, actually, when he filmed a Pepsi commercial in the 1980s, and many of you will likely remember that. And so he used a monoplace chamber. And there's all these tabloids about it, like, that he was using it for anti-aging and he was sleeping in it. And it's certainly possible, but actually, he was using it mostly for healing up the burns that he sustained. And so these monoplace chambers go to 3 ATA. And they can be used for all medical indications for hyperbaric therapy except for decompression illness, which is the bends.

And then the new kid on the block for about the last 20 years or so has been the mild or soft-sided hyperbaric chambers. And these typically go to the atmospheric equivalent of what we call 1.3 ATA, which is about 10 to 12 feet of seawater. And these chambers have been around and only have one medical indication, and that is mountain sickness. So if you climb up a mountain too fast, you get lung issues or brain issues, mostly lung swelling and brain swelling as a result of the pressure changes and the altitude. These chambers are medically approved to use for that particular indication. However, over the research, sort of, spectrum over the last many years, it seems that the brain is most sensitive and most optimal for pressures that are between 1.3 and 2 atmospheres. And that's between about, as I said, 10 to 12 feet of seawater and 2 ATAs, 33 feet of seawater. And so, these mild units are being used. And I like to call them my neuro-hacker specials, really, because they're looking like they can be used, as the research has developed over the last 20 years, specifically for brain and cognitive optimization, neurocognitive recovery, and also more mild things like muscle recovery,

jetlag, and overall, sort of, optimizing our health, especially if we're using it in conjunction with other technologies.

The medical-grade chambers really can go to any pressures, as we said, but typically are used at the deeper pressures for more of the medical conditions. And I think the major thing to also describe here is that most of the research has been done in the medical-grade chambers up until about the year 2,000 or so. And even so now, all the research that's been published has been in medical-grade units. However, they have been using the more milder pressures. And I think that's been what's been really exciting for me, Katie, is that now that we can see not just hyperbaric therapy, but other therapies being used in conjunction, I think the mild units have significant potential impact. But that's not for everybody. Some people do need the medical-grade chambers depending on the indication.

Katie: Gotcha. Okay. And you've mentioned that, like, these can be used, certainly on their own, but also in conjunction with other things to make other therapies more effective. Can you elaborate on that a little bit?

Dr. Sherr: Sure. I mean, my whole practice, Katie, is one that really focuses on integration in the sense that hyperbaric therapy is this fantastic recovery optimization synergizing tool. But it's just one tool in a toolbox that really does benefit from a foundational approach. And so, when I'm speaking to my clients or people across the world that have consulted or would like to speak to me about their protocols of hyperbaric therapy, often 80% of the conversation is about how you can integrate hyperbaric therapy in a way that you're looking at what you're doing before, what are you doing during, and what are you doing after hyperbaric therapy? The idea really is how can you create the ability to make energy more effectively? Because in the end, what is oxygen doing is actually helping you make more energy at the cellular level. And that's because the energy that's being made is something called ATP. In our mitochondria, oxygen is used as the final electron acceptor in something called the electron transport chain.

So as a result of that, you need to be making energy effectively if you don't have optimized levels of vitamins, minerals, nutrients. If you're toxic, if your gut is toxic, if you have heavy metals in your system, it's really important to address those things first if you have time because that's how you're really going to be able to make energy most effectively. And so when I talk about integration, one of the first things that I think about is how are we able to optimize energy production at the cellular level? Because if it's not optimized, you're not going to do well in the chamber. And so that's when I have my own concierge wellness practice where I look at those kinds of markers, something called Health Optimization Medicine, founded by a colleague of mine, one of the smartest dudes in the world and also a physician named Dr. Ted Achacoso.

So, when I'm thinking about optimizing and integrating, that's the first thing I think about. And then after optimizing health, if there's time, but if there's not, at least addressing some of those same ideas, how are we making energy more effectively? How we detoxify more effectively is also important. And so, one of the major things that I always consider with hyperbaric therapy is a technology that I think you're very well aware of, Katie, is called infrared saunas, for example. So helping with detox and infrared sauna is a huge, huge help for many of my clients that are going through hyperbaric therapy. And so, that's one of the major ones. I also

think of low-level light therapy. I think of other, sort of, breathing practices that are not technological that help with oxygen delivery. I also think about what are you doing inside of a hyperbaric environment, for example, to optimize your time in the inside of the chamber? So if you're getting more oxygen going to your brain and to your body, you should be thinking about other therapies, for example, electrostimulation or neurofeedback or even low-level light therapy to target the areas where you need the most help.

And so, it's a larger conversation with clients about what are their goals? Are they short-term goals? Are they long-term goals? Is it condition-based? Is it more optimization and optimal wellness, kind of, based? But in the end, it's always about trying to optimize that foundation first if I can because that's really where the power is no matter if you get into a hyperbaric chamber or not, no matter whether you get into an infrared sauna, or you do crazy biohacking technologies or take the biohacking supplements. Like, the idea really is that we should be measuring what we need and be using that data as our foundation, no matter what we're gonna do.

Katie: Such a great point. And I love that you brought up saunas. Like you mentioned, I'm a huge proponent of sauna use. I have actually have two different types of my house. And I think it's probably the closest thing to, like, a silver bullet that if it was a pill everyone would take it that we can get to it just with the data that we've seen on reduction in all-cause mortality and risk of all of the major killers, but also just the day-to-day benefits as well. It's definitely something I incorporate daily in my life. But I also love that you brought up, like, you know, all these expensive biohacking treatments. That's always a point of resistance for a lot of people. It's certainly, like, not everyone has access to these things, or can easily afford them, or just have the time to do them.

But the same things, like you just mentioned, that make this more effective, are also just beneficial things to do no matter what. And I always go back to the free things, and you might have things to add to my list. But, you know, it's easy to get sucked into all the fancy supplements or all the cool biohacking equipment. But at the end of the day, there are so many free things that we can do that are the foundation that I feel like are absolutely the prerequisite to any of those, even if...or even if you don't do those, things like getting enough natural light in the morning and avoiding artificial light at night, that's drastic for your sleep, or simply making sure you're hydrated and getting enough minerals can be really drastic and also important if you're doing hyperbaric. And so, you know, it's easy to look at the shiny objects and want to jump into all these fancy things. But I love that you have that reminder of make sure you've got the foundation covered first. Are there any other foundational health things that you recommend to people?

Dr. Sherr: Yeah, thank you. That's well said, Katie. And that's where I always start. In fact, I gave a talk...I was asked to give a talk about an hour before I had to give it about two years ago. And they asked me to talk about hyperbaric therapy or whatever I wanted. You know, I was like, you know, I think for the particular audience, I was, like, what are the free things that everybody can do no matter much money you have, no matter where you are in life? I mean, obviously now with the pandemic and everything, it's really a difficult time for a lot of people. And I talk about...The first thing that's very easy is connection, right? It's not medical at all, but it is medical, right, because we know that the more isolated you feel, the higher risk you have of dying.

And so, number one for most people is not only connecting externally but actually connecting internally as well. And so this is not just...This is just understanding that the world around you is only...you're only responding to it in the way that you're internally programmed. So, if you can work on those internal programs and connect with yourself, it can be a major benefit. And so, meditation is free. Connecting with yourself is free. Connecting with your family is free. Sometimes it's too free. I know how that feels with having four kids. I know you have six at the house, Katie. So it's a lot. It's a lot of free connection. But that's important. You know, that releases hormones that we need. And so connection is a really big one. And that's not just on our phones, of course. I know now we're all virtually connected and that's how we have to connect. But touching people and hugging and that connection is really important when we can get it.

The second one I always talk about is moving. And movement, and I know you're big on this too, Katie, is no matter where you are, you can always move whether it be in your house, whether it be in a small apartment in New York City, a small house in San Francisco where I live, although I have a backyard, or if you have time to go outside, even just walking around the block. And it's something that I've taken to heart throughout my life is that, you know, your body, sort of, wants to stay in motion. If you get it in motion, it's just sort of that internal inertia, but movement is free. So, getting your movement and getting outside, and even just jumping up and down 10 times can really change how you feel. And that's something that I did during this particular talk and it was really well-received. And actually, I talked somebody off a ledge, literally, from committing suicide by just having them jump up and down 10 times before they really wanted to go ahead and do it. So it's really, really amazing what movement can do.

Now, the third thing, and I know you had, I think, Dave Asprey on the podcast recently, is fasting because, obviously, not eating is free. So, not eating is a big one too. And, of course, doing this in a more methodical way and working up to various types of fasts. I think you do a water fast every year, Katie. I do a 72-hour fast every quarter, for example, that's typically a water fast, sometimes with a fat fast depending on how I'm feeling at that particular time. But even just doing an overnight fast that's more than eight hours is important too. And you can work on these kinds of things. Not eating is free. It feels, sort of, first-world to say that not eating is free. But on the same level, fasting has been around for generations, for thousands of years. It's been part of religious and spiritual practice for a long time, and there's a lot of cleansing that can happen with that.

And the other thing that I think about here is, obviously...I mean, the other ones are, sort of, less described that you've already spoken about them. Sleep is a very important one. My colleague, Dr. Ted likes to say that, "Your day doesn't start when you wake up, it starts when you go to bed." And I think that's a really important one for people. And so, Health Optimization Medicine that he founded and that actually I serve as the chief operating officer in the U.S. of our nonprofit is actually, that's one of our major modules, our major tenants of health optimization is chronobiology or circadian rhythms and focusing on those.

And so I really focus on sleep as a big proponent of the practice that I have. And when I talk with patients about hyperbaric therapy, I talk about sleep. I talk about movement. I talk about fasting. I talk about water and hydration that you mentioned, Katie. And then I talk about all the fancy stuff too but not before I speak about the foundational tools. But I have to admit to you, once I found out that I was gonna have a fourth kid a couple of years ago, that was a surprise to my wife and I even though we're both doctors and we should know our

anatomy, but that's what I gifted myself, an infrared sauna. And I use my infrared sauna just about every night in my...it's my own room in our small house where nobody's allowed to go in, at least not yet because they're not old enough. But so infrared sauna is a big one for me, and that's how I relax before I go to bed. That's where I do my meditations.

And for my clients and for my patients across the world, it's one of the major investments that I will recommend if they have the money to do it aside from, of course, getting a hyperbaric chamber. Those are more expensive than an infrared sauna. But the ways you can use the chamber over the long-term to optimize are fantastic. You know, I often say that it's not when you need...it's not if you need hyperbaric therapy, it's when you're gonna be most optimal to use it or to have it. And so, that would be not a free hack but a very important one too, I think.

Katie: Just to reiterate as well with hyperbaric, I didn't ask when we were talking about the initial uses, are there any risks of using hyperbaric that people need to be aware of?

Dr. Sherr: Yeah, sure. I mean, there definitely are. And so you're under a pressurized environment and you're getting more oxygen. And so, if you can't be getting one of those two things, then you shouldn't get into a chamber. But to give that, sort of, on the macro level, if you have any lung disease, you shouldn't get into the hyperbaric chamber unless it's well-controlled. If you have asthma, for example, and it's well-controlled, that's fine. But if you have COPD emphysema, it can be dangerous to get into the chamber because you have already a difficult time with oxygen in your body. If you have any cardiac disease, heart disease, if that's uncontrolled, if you have heart failure, for example, it can be dangerous to get into the chamber under certain circumstances.

If you have an uncontrolled medical issue that's related to your brain, for example. So if you have a seizure disorder, there is a small risk of having a seizure in the chamber. Although we have significant ways of mitigating that in the chamber as well so that if it's controlled, it's not typically an issue. If you have issues with your ears in the chamber as well just like if you're a diver, or diving under the water, or if you're on a plane or a train, it's the same kind of thing. You feel that pressurization change in the ears. And as a result of that pressurization change, you have to be able to pop or decompress your ears. And if you have a hard time with that, it could be hard in the chamber. The major contraindication, the major reason you can't get into the chamber is if you already have one of your lungs that's collapsed. So, for most of your listeners, that won't be an issue.

And the other contraindication, although it's still used for this, sort of, secondarily is if you're pregnant. If you're pregnant, you're not supposed to get into a hyperbaric environment, although they do use hyperbaric therapy for carbon monoxide poisoning. And they put patients in that are pregnant, and the kids do fine. But it's something that you're not supposed to do. And, you know, maybe one thing that I didn't speak to in detail, Katie, and if you're okay with it, I'll discuss a little bit about some of, like, actually, the major indications for hyperbaric therapy because I think I, kind of, skipped over that a little bit.

Katie: Absolutely.

Dr. Sherr: So, some of the major indications for hyperbaric therapy. Like I mentioned that there were 70 indications across the world, there's 14 in the U.S. The ones that are covered by insurance are diabetic foot ulcers. So I've saved many patients over the years from getting amputations. Sadly, it's oftentimes after they've already received an amputation before because of their diabetes. There's also radiation injury from cancer treatment. And that's radiation that's been given for cancer treatment that's left some sort of wound that doesn't heal or a wound that develops many years later. Hyperbaric therapy is fantastic at healing these wounds because it's, sort of, rebuilding that scaffolding of tissue as I was describing before, stem cells getting released, blood vessels getting to the tissue, new connective tissue, new bone, new neurons, all that stuff. And so, as a result of that, it can be used for radiation injury, be very effective in that capacity.

There's also chronic bone infections. And chronic bone infections are very difficult to treat with just either surgery or antibiotics. And sometimes hyperbaric therapy can be helpful in that capacity as well. And there's sudden hearing loss. If you've lost your hearing and all of a sudden can't hear, that's a neurologic issue, and hyperbaric therapy can heal that up pretty quickly many of the times, especially in combination with conventional care. And there's also sudden...there's also grafts and flaps. So if you've gotten a plastic surgery, for example, and the plastic surgery is not taking very well, hyperbaric therapy can help that typically heal faster.

And then on the investigational side outside of the things that are approved, although there are other ones that are more in the acute side that are approved, like trauma and infections, etc. But the ones that most of your listeners will be interested in are the things that are not covered by insurance, but there's significant data to support them, that are things like traumatic brain injury, and stroke, and chronic pain syndromes like reflex sympathetic dystrophy, and used in conjunction with functional medicine or health optimization medicine, things like the dementias, the Alzheimer's, Parkinson's, vascular Lewy body dementia, Lyme disease, other infections, surgery. And so healing faster from surgery, whether it be a plastic surgery like a nose job, or something more significant like a hip replacement, or abdominal surgery, hyperbaric therapy is gonna help you heal faster, and potentially more efficiently and more optimally or more completely than you can on your own depending on the circumstances.

There's also hyperbaric therapy being used in fertility, actually. And there's some interesting data that's coming out of other countries how hyperbaric therapy can improve vascularization of the uterine lining and help with implantation of the embryo. And then obviously, helping them with a more successful pregnancy. And on the male side, helping sperm being more optimal. And so basically, getting more sperm to have more capability to be as healthy as possible so that it can implant an egg. So, those are some of the major things but it's also, as I was alluding to, Katie, it's important to always remember that it's not just about getting into the chamber, it's about what are you doing before, during, and after?

And so if somebody comes to me and they wanna get pregnant, for example, the first thing I would say is, "Well, what have you done foundationally first before we even discuss getting into a hyperbaric environment?" That happens with people that come in with migraines, with dementia. And so I use my Health Optimization Medicine practice as that foundation or I refer them to other people that can help them with that foundation, as well. Then, of course, there's also the ability to use various supplements and various other practices that can help along the way, whether it be for a nootropic benefit, for lymphatic benefit, for detox benefit. If somebody's had a brain injury, for example, we're also talking about things like neurofeedback as well.

But again, it's sort of the cart before the horse, getting into a chamber, getting neurofeedback, getting and doing even some of the fertility treatments that you might get if you're trying to get pregnant before doing that foundational stuff first. And I always ask the question to people, like, how many supplements are you taking and how many supplements did you actually measure that you needed before you took them? And the first answer is, like, 99% of people. The second answer is maybe 20%. And so that's where...and I know I'm always bringing it back to this, Katie, but I wanna, I guess, emphasize that it's the foundational stuff that's so important.

Katie: I agree with you on that, for sure. And with the supplements as well, just like with the silver bullets and the biohacking stuff, there's so many out there. And if you just rely on the marketing materials, you can easily be convinced you need to take so many. I'm a big fan of testing as well. And also just tracking and keeping track of what I'm taking. I also don't take anything every single day. So I always rotate just so the body doesn't adapt to a supplement. But I think that's very important advice as well.

This episode is sponsored by Four Sigmatic, the superfood mushroom company! I love all of their products, especially their coffee infused with brain-boosting lion's mane and their reishi elixir at night for awesome sleep. I've also recently been trying their protein powder and really love their peanut butter flavor. Peanut Butter is one of my weaknesses, and I love that I get all the flavor of it in this protein packed format rather than in the super calorie dense peanut butter. You can try all of their products (I love them all) at [foursigmatic.com/wellnessmama](https://foursigmatic.com/wellnessmama) and code `wellnessmama` gives 10% off.

This episode is brought to you by Wellnesse. That's Wellnesse with an E on the end. We make personal care products that go above and beyond just non-toxic to actually be beneficial for you from the outside in. I realized years ago that even some of my most naturally minded friends and family members who made an effort to eat organic food and be really cognizant of what they brought into their homes were still using certain personal care products, mainly hair care and oral care. And the reason was, they weren't willing to sacrifice how they looked and felt just to use natural products. And none of the natural products they were finding really lived up to the conventional products as far as how effective they were. So, I resolved to change this and realized I had things that I've been making in my kitchen for years that worked just as well and that I could share with other families, and thus Wellnesse was born. You've probably heard that what goes on our body gets into our body and that many of the chemicals we encounter end up in our bloodstream. To me, this means non-toxic and safe should be the absolute bare minimum baseline for any products that are in our lives. But I wanted to take it a step further. I wanted it to use this to our advantage to actually put beneficial

ingredients in our hair care, toothpaste, personal care products so that we could benefit our body from the outside in. Why not use that wonderful skin barrier to our advantage?

Our hair care is packed with ingredients like nettle, which helps hair get thicker over time. Our dry shampoo has scalp promoting products that really help follicles stay strong. And our toothpaste, for instance, has a naturally occurring mineral called hydroxyapatite, which is the exact formulation or exact mineral that's on our teeth that's present in strong enamel. So they're all designed to work with the body, not against it to help you have stronger, healthier hair and teeth. We now have a hand sanitizer that doesn't dry out your hands like many hand sanitizers do. I would be honored if you would check it out and I would love to hear your feedback. You can find all of our products at [wellnesse.com](http://wellnesse.com).

When it comes to hyperbaric, can you explain to people how they can find all the different options you've mentioned in their various areas? I know this is a somewhat newer mainstream treatment that is hard to find in some areas. So how can people find hyperbaric?

Dr. Sherr: Sure. So, as we were discussing before, there's different types of chambers. There's the mild units that you can get for your house. There's the medical-grade units, which you need to go to a facility for. And sometimes these facilities actually have the mild-sided units as well. And then there's, of course, the multiplace chambers, which have multiple people getting treated at the same time. Most academic centers around the U.S. and around the world have at least one multiplace chamber per city is mostly what you'll find or at least one medical-grade facility per city. And so, there's independent hyperbaric facilities all across the world. I work with facilities all across the United States and across the world. I have several facilities here in the Bay Area that I work with and that I work in. So there's several that are medical grade.

And so, what I would always recommend that you consider is that, you know, not just, you know, where the facility is, but what is your goal getting into the hyperbaric environment? And that's where doing some education, listening to some podcasts, and potentially talking to the people at the facilities to make sure that your goals will be attained at that particular facility. You know, for example, there are lots of mild-sided unit facilities around the world. And these are typically in facilities that have lots of other technologies for the most part. And it's important, though, if you're gonna go to those facilities, that you understand that the mild-sided units are only used for a very circumscribed number of things. They should not be used for any of the medical indications of hyperbaric therapy. And they're more focused on the neurologic side of things, so neurocognitive optimization.

And so, if you're looking at it for more like a spa kind of thing, along with the neurologic things, the hyperbaric units that are the mild-sided that you can use in your home or you can use at a facility are probably the ones to go to. But if you have more systemic kinds of things, if you have chronic medical conditions, if you have, you know, chronic fatigue syndrome, if you have autoimmune problems, if you have chronic wounds, if you have really significant goals from, like, endurance, for example, or you're looking to really optimize the system in totality, then the hard chambers are really best for that, especially if they're being used in isolation.

Now, there's always caveats to these things. And this is why I consult and educate people through my own practice virtually across the world. I have a virtual hyperbaric practice where I speak to people all over the world. And as I was mentioning before, most of my conversation is not about hyperbaric therapy, 80% of it is about other stuff, the integrative stuff. But on the hyperbaric side, that's where I can help people coordinate and understand from a local level what's gonna be best for them. And that's one of the reasons I do podcasts as well is to help educate people and so that they understand that they have a particular condition, most likely it would be most beneficial to get into a certain type of chamber as opposed to another type of chamber.

Now, from the mild-sided units, you can have some benefit systemically. You can heal wounds. You can help with injury recovery, even if it's outside the central nervous system. But in the deeper chambers, you're gonna get it faster. And so, one of the things that I work on a lot is how you can integrate and...because the mild chambers are more available, how you can use these mild chambers in a way that helps, from a technological perspective, fulfill your goals faster. And so I have a company called HBOT Plus, H-B-O-T P-L-U-S, HBOT Plus. And we're making technology that's making the mild chambers work better. And we're in development now and we have this ability, I think, potentially to make the chambers that are even at the mild side actually modulate deeper pressures in certain ways.

And we're doing these various protocols and we're doing various ways people can track their progress inside the chambers using an app as well, and various protocols that are built in to help people understand how they're reaching their goals, what protocols might be best for them, what integrations might be helpful. And also, we're doing testing. So you mentioned this too, Katie, that I think it's very important that people are tracking things over time. So the biggest one very easy for most people is tracking sleep, for example. But I also check things like HRV and also blood markers like oxidative stress markers. And we can track these things over time. And that's what we're working on with my technology and with my company is to help people create these wellness plans for them and give them technology that makes the chambers work better and work for them more optimally.

And so, I think that's really where I've been going lately is how can you create technology that everybody can then potentially access, at least for a more affordable price? I know it's expensive, but actually, I'm working on various ways to make it more affordable in 2021 for more people to be able to access hyperbaric therapy as this amazing synergistic tool. At the same time, always creating the conversation that it's the foundational stuff that everybody can do. And then, as we described earlier, Katie, it's important that if you can optimize oxygen utilization, if you can optimize energy production, it doesn't matter what you do, you're going to feel better. So, let's focus on those things along with getting into the chamber, and optimizing, and all the cool biohacking nootropic ways that I also do all the time myself and with other people at the same time, as long as that other stuff is being addressed first.

Katie: Let's touch briefly on that. I love that you brought up nootropics and I think stacking those sounds like it could be incredibly effective. But for people who don't have access to hyperbaric at this time, what are some

ways that they can use nootropics on their own for increased performance? I know this is also a world you're pretty well-versed in.

Dr. Sherr: Yes, so the nonprofit company that we have called Health Optimization Medicine, we have a for-profit company, a sister company that works together, because we know that on the path to optimizing your health, you're going to have bottlenecks. We all do. Whether it be digestive, whether it be brain, whether it be sleep, there's lots of different things that, kind of, muck it up in the process. So what we've done as a company is created a company called Troscriptions. And it's like prescriptions, but a T-R-O in front of it. And it has as the first two products in the line nootropic products. And the reason is that as we're optimizing our health, one of the major bottlenecks we have is our brain function. And so we created two. And, you know, I have lots of experience in nootropics outside of my company, as well.

And what I see as nootropics is really there's two categories of them, Katie. They're the ones that are more health optimizing and then the ones that are more, sort of, performance optimizing. And so you could...In the category of health optimizing, those are the ones that I like to start with, with most people, because the performance-optimizing ones typically can clock the system and then potentially overclock the system in a way that makes your brain pay for it over time. It may not be the next day, but it could be in two weeks, two months, etc. And so health optimization nootropic, for example, and this is a categorization that Dr. Ted, my colleague, actually came up with and would describe in more detail than me, but, in general, are things like supplements that improve brain function only, but don't have the ability to create potential toxicity or a potential overclocking of the system, where you don't have the optimized level of vitamins, minerals, nutrients to be able to really fully harness that energy production.

So, the common one that we use in Troscriptions is one called methylene blue. And methylene blue is something that's been around for a long time. It was one of the first drugs described by the...actually registered with the FDA, excuse me, in the 1890s. And it's a health optimization nootropic because it helps make energy production more efficient at the cellular level. And it does it in about four or five different ways just in the mitochondria itself but helps you carry oxygen better. It helps you actually make energy more effectively because it works like oxygen on the cellular level and actually accepts an electron just like oxygen does. And so, methylene blue has been studied not only for a nootropic benefit, but it also has antiviral, antifungal, antibacterial benefit. It was actually used before antibiotics were around for urinary tract infections, and for malaria, and actually for viral illnesses.

And some interesting studies done with viral illnesses combined with methylene blue, plus a certain spectrum of light, actually UVC, ultraviolet light in the UV spectrum actually as a way to kill viruses. So methylene blue has this fantastic health optimization nootropic potential because it's actually...What's interesting about methylene blue is that it actually concentrates in areas where there's more mitochondria. And there's more mitochondria in your heart, in your brain, and in your liver than anywhere else. And so that's where it concentrates. And as a result of creating more energy production in those areas or energy capability, you're making more brain function. And so we're seeing in the people that use our products that people are using methylene blue for endurance, they're using it for energy production and they're seeing the benefits on the macro scale, which is super cool.

And just to give an example of our performance optimization nootropic, which is one that can, sort of, clock the system, potentially if you don't have that foundation first, we have our other nootropic which is called blue cannatine, and blue cannatine also has methylene blue in it but it also has nicotine, caffeine, and CBD. And so, everybody knows that nicotine is in cigarettes but nicotine is actually a fantastic nootropic. But it does have a stimulant quality to it. And as a result of that stimulant quality, it's going to clock the system, help you or force your body to make more energy to actually stimulate that, will give you that stimulant feeling, and improve neurotransmitter release that help with optimizing your brain function like acetylcholine, and dopamine, and serotonin, for example.

And so, nicotine itself is a fantastic nootropic. It should not be smoked or vaped in my opinion, in our opinion as a company because it has an addictive component to it. But especially when it's used in combination with additives that are in tobacco products and especially when it's smoked or vaped because it hits you so fast. Everybody knows caffeine, caffeine is a stimulant but people also know that you can have too much caffeine and then you can start messing with your hormones, and your adrenals, and things like that if you haven't optimized your system beforehand. Then, of course, CBD, it's more on that health optimization nootropic side of things rather than the performance optimization but it's an anti-inflammatory. It's neuroprotective. And so we use it in the formula to help with users that have not potentially optimized their system as well as maybe they could have, but still wanna get the benefit of nootropic and, sort of, that launching feel that you get with the stimulants of nicotine and caffeine in there, which can be fantastic to get work done. And, of course, it has methylene blue as well.

And so these are short-acting nootropics, both of these. They're three to four hours in length. And they can really be fantastic for people's brain function. But again, it's always using it in conjunction with understanding that foundational side. And then I've been using the methylene blue in combination with hyperbaric therapy, for example, because we know that if you're optimizing energy production, you're going to help the oxygen work better too. And we know, actually, that methylene blue helps with NAD production, or NAD+ production, which is very important for the cells working in energy production as well. And so, nootropics are a great, great tool but understanding, "Are you taking something that's more health optimizing or are you taking something that's more performance-optimizing?" That's really the question. And that's really something you should be considering when you're taking it no matter what it might be.

Katie: I feel like we could do a whole episode just going deeper on nootropics. In fact, I think we should probably do that one day. But I know we have time constraints today. So I think we'll have to bookmark some of those follow-up questions because I certainly have so much more I would love to you talk about.

Dr. Sherr: Yeah. We'll get Dr. Ted on for you. He's the guy that can delve into that even more deeply than I.

Katie: Perfect. We'll get that on the books. A question somewhat unrelated that I love to ask toward the end of interviews is if there is a book or a number of books that have had a profound impact on your life, and if so, what they are and why?

Dr. Sherr: It's a great question, Katie. I was thinking about books yesterday because my kids love books. And they just would read "Harry Potter," every one of them, every day if we let them. So we try to obviously bring new books into the house all the time. And I know the power of books. I know the power of books to me as I was a kid. I remember I was at a sleepaway camp as a child in New Hampshire and I was the bookworm. I was the guy that would be sitting in my bed, reading books all the time. I've always been a huge fan of books. And it's difficult for me to think of, like, these seminal books for me. But I was thinking about this recently because I was chatting with my kids because they asked me the same question. And I gave them two books, two adult books, at least. And I gave them a kids book too. And I'll tell that last, the last book.

The first book that I think had a huge change recently, within the last 5 to 10 years, was a book by a guy named Itzhak Bentov, and it was a book that was published in the 1980s. And this is, sort of, my evolution over the last many years into the world of inner understanding, you know, my inner world, right, the inner, the personal, the person who I am inside, let's say, and this is a book called "Stalking the Wild Pendulum." And it's a book about consciousness. It's a book about frequency, vibration, consciousness, and how it reflects both internally and like the very deep space that we are really, and also in the cosmos, and things like that. And so it's a very cool book, it's not very technical, it's written actually from a non-scientific perspective, which I think is really interesting because a lot of the concepts that he describes in the book are now physical realities, like we understand physics understandings of these kinds of things. And so we can actually describe them by physics, etc, which is super cool.

So it's a book that I read many times, and that I go back to because, again, I think personal practices are mostly free, and are transformative because, again, the world around us is a reflection of our internal state, whatever that might be, our internal program, our internal programming. So if you can be more cognizant of those internal programs and be more aware of them on a daily basis. And also understand that vibratory frequency is something that is inherent in everything. I know that's a little bit new-age for people, but if you can just remember that everything is a vibration, no matter what it is, whether it be a rock or a nuclear bomb, everything has a vibration, and if we can understand that and we can, sort of, gravitate towards our optimal vibration, that can have a significant benefit for overall health. And a lot of my clients over the years, as they created these practices, have had very little else they needed to do from a supplement, from a wellness perspective if they can do these kinds of things. So that's been one of my favorite books over the last many years.

And then another book that I really enjoyed is...and there's a new book out now that's very similar. It's called "Atomic Habits," which I'm sure you've heard of, Katie, and many of your listeners have. But there's another book that came out about 15 years ago that I love, it's called "Habits." And it's by a guy named Charles Duhigg. And it's a great...He's a "New York Times" bestselling author. He's just a fantastic guy, and a fantastic writer, and he talks about habits and how we make them and how we break them. A lot of the same concepts that

are in "Atomic Habits," you know, these books tend to come around every 15, 20, 30 years where we need to see new people write very similar books, but just in different frameworks.

And so it's going to be really funny, but my favorite books as a kid were the Grissom books. I loved all of his books and I would just read them from cover to cover. And I always...it's funny to think about because...you know, but they're just page-turners. And then things that get you happy and get you excited when you're a kid. When I was like 12 and 13, that's what I was reading was all the Grissom books.

Katie: Awesome. Well, "Stalking the Wild Pendulum" is a new recommendation. Now I'll have to check that one out. And I'll put links to all of these in the show notes at [wellnessmama.fm](http://wellnessmama.fm) along with links to all of your sites, and to the nootropics that you mentioned. For all of you guys listening, you can find all that at [wellnessmama.fm](http://wellnessmama.fm). And Dr. Scott, thank you for your time. This was so much fun to chat. And like I said, I think we need to go deeper on nootropics in its own episode, but very grateful for your time today.

Dr. Sherr: It's been a pleasure, Katie, thank you for having me.

Katie: And thank you, as always for listening, for sharing your most valuable assets, your time and your energy, with us today. We're so grateful that you did and I hope that you will join me again on the next episode of the "Wellness Mama" podcast.

If you're enjoying these interviews, would you please take two minutes to leave a rating or review on iTunes for me? Doing this helps more people to find the podcast, which means even more moms and families could benefit from the information. I really appreciate your time, and thanks as always for listening.