Hyperbaric Oxygen Therapy: The All-in-One Therapy for Heart Disease and Cognitive Function Transcript

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Introduction to Hyperbaric Oxygen Therapy

All right, everybody. Do not move. We've got one of the best interactions that there's going to be at this amazing summit. Reverse Heart Disease Naturally.

Because sometimes we get the opportunity many times to bring the top dog, the big kahuna, the scientist, the leading academic person. And this is what we're going to talk about right now.

Hyperbaric oxygen therapy. Everybody write down your notebook. H b o t. And you know we can talk to anybody locally. There's so many good people in this area.

And we're going to relate hyperbaric oxygen therapy to heart disease and other conditions. But we're not bringing anybody. We're bringing Amir Hadanny, M. D.

who, I was just speaking a little bit in my gibberish Hebrew to him, and I'm going to speak in my gibberish hyperbaric oxygen therapy knowledge to him.

But this is like really a big bonus. Everybody get excited. Right now we've got the guy, Amir Hadanny MD, PhD, a Harvard research fellow in the brain Modulation Lab.

In the last few years, trained his medical doctor in Tel Aviv, Ph. D. in, bioinformatics and computational biology. He can probably do really good at, word puzzles because this guy as a brain is like a computer did neurosurgery training at a medical center in Israel, joined a Vive scientific.

And we're going to learn right now about what is a VS scientific. But it is a worldwide company. I'm very familiar with. I've had a wonderful time, in the past interviewing Chaya Frati, MD, who, I think, Amir will tell us about as a colleague and a leader in applying new technologies to heart disease, brain disease, psychological disorders.

This is truly one of the most exciting topics. Okay. Time for me to shut up and say hello. Amir, Dr. Hadanny. Thank you. Hi, I'm Joel Kahn. Thank you for having me. Real honor.

Happy to join and tell you all about it. Yeah. And I just want you to know, I mean, this conversation for the next half an hour will ultimately probably be reviewed by half a million people.

We're going to really reach a lot of people. It could be more, we're all been, you know, for wonderful, wonderful reach. And, a lot of them don't know what we're talking about.

So I already, like, spilled, the secret hyperbaric oxygen therapy. And, you know, tell us about is, you know, for the public, I mean, what that means.

Okay, you're sitting in some kind of room and something's happening. But tell us, you know, a little of the history of it, but really, 2023. Whoa. This is exciting.

Awesome. So, exactly like I said, HBO, the hyperbaric oxygen therapy, basically what we're talking about is giving someone to breathe 100% oxygen in an environment where we raise the pressure more than the regular atmospheric pressure, which is one atmosphere.

How HBOT Works and Its Origins

And when we do that, we actually harness a nice physics law that people call Henry's law. We are able to dissolve more oxygen in the person's blood, so we have much more oxygen flowing in the blood flow, enriching the tissues.

And we talking about a lot more, almost 30 times more than what you and I are right now breathing well. So in my very, very rudimentary understanding is people all over the world during the pandemic bought an oximeter.

They put it on their finger and it shows that your red blood cells are 98% saturated with oxygen. Okay, maybe you can make it 99, making you make it 100, but you can't do much more than that.

If you're talking about driving oxygen into the plasma, into the fluid of the blood, because the red blood cells are already in good shape, and that carries a whole new stream of oxygen to tissues, heart, brain, toes.

And, you know, how did this begin? I mean, we're talking about diving accidents. Is that, what, we go back 100 years or more? Exactly. So, first of all, I really like what you just explained about the difference between the plasma and the red blood cells.

Definitely. We're taking it to a whole different physiology, something that we cannot achieve with just a normal oxygen mask. We're super charging our blood with, oxygen.

And then, yeah, it all started about more than 100 years ago with diving accidents, people who were, diving and building bridges around the world, that they didn't dive the proper way and had some accidents, eventually had to go inside, special chambers.

They looked much different back in the days. And, the idea was to supercharge them with oxygen in order to remove, bubbles that may occur due to what they called, then the bends or decompression sickness, as we call it today, due to some issues with their diet.

A couple of years afterwards, they discovered that they can utilize that technology to treat wounds, and when we talk about wounds, we're talking about non healing wounds.

A lot of the times due to diabetic foot or diabetic feet. But there are other, issues or diseases that can cause non healing wounds that don't heal by themselves.

And they discovered we are able to treat those wounds by hyperbaric oxygen therapy and help the body heal itself, because otherwise the wound will not heal, will become the chronic.

And we'll probably have to amputate that limb. Another, very common use of beauty again for years and years now has been radiation injury, meaning patients who underwent radiotherapy due to different oncologic or, diseases or cancer in different places and suffered from radiation injury, meaning the radiation itself caused some issues.

We were able and are still able to help that with with but and practically speaking, what is the only treatment for radiation injury. The only thing that we know, that can help that is moving forward down timeline.

We still had it for those two main, indications. And I'm talking about chronic indications. There are a couple of acute indications that probably we will not go into today.

And then we're talking about early 2000, like you mentioned, my colleague and great mentor, Professor Shai Frati, who was, nephrologist back in the days, found out due to several case studies that patients who had those diabetic food that were treated with HBO, RTE, and concurrently had a neurological disease such as a stroke were actually improving due to the HBO they were giving for the wound.

They were actually improving their stroke symptoms, and that was phenomenal. But again, when both Shai and myself talked about it and reviewed these cases, we were saying, okay, this is this is nice, this is interesting, but we need to validate this.

And eventually, Professor Friday initiated a large randomized control trial on stroke patients and proved using proper empiric tools that HBO can help stroke patients.

And that was the first of many studies that we've done to study the effects of built in neurological diseases. All right. Well, that was incredible.

Chamber Setup and Treatment Protocol

And I don't know if my memory is right, but prior to professor shy of Rodney, in Tel Aviv, professor and nephrologist, I think in the United States or about 13 medical indications were hyperbaric oxygen therapy was approved for insurance reimbursement.

There was enough scientific evidence. You acutely lose your hearing. You find a hyperbaric oxygen location, and you could have the therapy paid for because of the scientific evidence.

But now we're talking the new era, and the new era is exploding, including just recent. As I, chatted with you before we even went on live about young children with developmental disorders.

So tell us some people don't know a hyperbaric oxygen therapy, you said right at the beginning, takes higher pressure than atmospheric pressure. So we're talking about a chamber.

I know there's thin walled chambers. I've had patients buy one for their home, but they can't really achieve a high pressure. You're sitting in the villages in Florida, a retirement community that has one of the world's elite hyperbaric chambers.

But you have a thick walled, multipurpose kind of community, hyperbaric oxygen, sort of like a sauna, but it's a sauna for, you know, 12 to 20 people.

But, I mean, it's a thick walled chamber. And what atmospheres compared to, room, pressure. So, just like you said, as you can see, probably in the background, the virtual background I have behind me, that's how the chamber looks like.

It's kind of looked like a spaceship. From the outside, you enter this door, you can see behind me, and it is a thick walled and. But in the inside of it, it actually looks like an airplane.

So each one of, each one of the client has, his own seat, comfortable seat, like a more comfortable, I would say, than common commercial airlines, probably.

And the the door is closed, and then air is being compressed inside the chamber, leading to the pressure goes up. Usually the therapeutic pressure we use is two atmospheres, which is equivalent to diving underwater more than ten meters below, the level of the sea.

So that's two atmospheres. And just like you said, two atmosphere is very hard to achieve in any of those. Soft wall or different, sects you may find on the internet, eBay or whatever, website you may look for.

You usually cannot, get to that pressure. And also most of these, different products cannot supply 100% oxygen, which is the other component. And third part, I really want to stress, we haven't touched yet, but specifically what we have done in our studies and then implemented in our, company.

And we've clinics that you've mentioned, we use a specific unique protocol, that what we do is in addition to the pressure and the oxygen that we're supplying, we are also doing oxygen fluctuations, meaning we're giving the patient 100% oxygen with the mask and then removing the mask for a few minutes.

So then the oxygen level in the blood drops back down almost to normal 21%. Then we go back up to 100% and then back to something like 21. That unique fluctuations in oxygen level is the whole trick.

We are tweaking the body to feel like it's under stress, like it needs to repair itself. This is a very unique concept we call hyper oxygen hypoxic paradox.

Hypoxia is low level of oxygen. Hypoxia is high level of oxygen. Like doing those fluctuations we causing the body to think that it's under low level of oxygen and induce several pathways of repair of brain repair or heart repair of muscle repair.

But it's all being done under normal or even high level of oxygen. That's the trick harnessing those pathways with a normal or high level of oxygen. Wow, that was a lot to unpack, but I'm going to I'm going to come to the Villages in Florida.

I'm going to travel to Tel Aviv or maybe go to Dubai, which to my knowledge are the three places right now I'm going to sit in the thick walled, hyperbaric oxygen tank for 60 minutes, I believe five days a week for 12 weeks.

Maybe I had a stroke. Maybe I have cardiac concerns. Maybe I have autism. Maybe I have PTSD. And how often am I going to fluctuate from 100% oxygen back to room air to facilitate this stress on the body?

Hypoxia Signaling and Patient Selection

How often does that happen? So usually the the the unique protocol we use is usually at two hours, duration. And we do the fluctuation every 20 minutes.

So you do five times during one time you're going to fluctuate one dive. Very good. And, I don't expect you to go too deep on this, but I think the Nobel Prize in medicine was about a factor called hiff hypoxia inducible factor.

And you guys have at least a theory, but I think you actually have data that alternating these oxygen levels from 100% to room air stimulates the body to make a factor that may be very repeat, repairing and healing.

Do I got that right? I'm just a local clinical cardiologist, so this is a little tough for me. You got it. Perfect. Like I said, it's half one alpha or hypoxic induced, factor one alpha.

That's the factor that's being stimulated due to those fluctuation. And that factor is usually induced by, by hypoxia, just like the name says. But we are able to induce it in normal or even high level of oxygen.

And that factor can cause a lot of different therapeutic pathways. For one, we'll give one example. We call and your genesis, which is the creation of new blood vessels, meaning if you have high level of heath, one alpha being induced, there are new blood vessels created, because of that.

But importantly, those new blood vessels are not created everywhere. They are created where they're needed, whereas there's actual lack of blood flow.

So you you won't be, like a Spiderman. New blood vessels everywhere. You have new blood vessels where you actually need it. Wow, wow. I mean, it sounds like some kind of vending machine.

I'll put $2 in it. I want more blood vessels to my right leg. I mean, it's crazy. So you're of scientific and have you and know and I know in Hebrew means spring.

It's part of the name of Tel-Aviv, the hill of spring, or the Spring Hill. But you have, been involved with a company I know admirers of medical that is really pioneering the delivery of hyperbaric oxygen therapy in these specific protocols to people who can get to a center.

I mentioned Florida, Tel Aviv and Dubai, this wonderful Israeli UAE relationship that's blossomed last couple of years. Three years maybe. So you mentioned, okay, unfortunate person had a stroke.

We're not putting him in the hyperbaric oxygen chamber the day they have a stroke, right? I mean, they can show

up a month later and do a 12 week protocol.

Correct. And I would even not recommend them to go in the first day. We usually wait at least two weeks after the acute injury. You want. You don't want to, start the treatment too early.

And this also applies for other pathologies as well. Again, not including the acute indications you mentioned those 13. But on the neurological conditions, we usually wait at least a couple of weeks after the acute injury.

And then we started the program. However, and I think that's, that's the key lesson of the day, and I, I can't stress this enough, whether you had a stroke, whether you had a traumatic brain injury.

The first and key element of our program is the assessment we assess. Any patient is coming in cognitively motor function, physical function and most importantly, brain imaging.

Once we have all that data and we have very unique protocols of brain imaging correlated with the motor and the cognitive or physical function, we want to assess if this patient is suitable for this program and will he benefit, or will he or she benefit from the program?

Patient selection is the key element of her beauty, and I cannot stress this enough because I know, like you said, 500,000 people are listening to this.

Are going to Google HBO to next. To me. That's the key thing. If you will go to something like that, you have to make sure they're doing patient selection.

Not everyone who had a stroke can go into beauty. They may go, but not all of them will benefit from it. You have to have professionals who are doing the right assessments in order to predict if this is going to benefit you at all, and this is really key.

Yeah. And it's not an easy protocol. One, it is expensive. Most people are paying for this. It's 12 weeks, five days a week for 1 to 2 hours. So this is a serious commitment.

It's not a one shot wonder, how wonderful that would be. But just, to close down on stroke the. You know, the improvements can be functional. You actually function better and walk better, speak better.

But MRI data, what do you see is a better blood flow on MRI or better brain function in MRI. Perfect. So just to complete that so we can have either motor function, better quality of life or actual cognitive function which is really, underdiagnosed.

Stroke Recovery and Brain Imaging

Unfortunately today, but apparently more than 50% of stroke patients suffer from cognitive dysfunction. So the cognitive function of stroke survivors is is really important to discuss.

As for the brain MRI, imaging, we have two types that we usually do. We have brain MRI that we can look at brain perfusion. And there we are able to see new or improved brain perfusion due to the new blood vessels that we talked about earlier from the angiogenesis.

Another sequence of MRI we call DTI or diffuse tensor imaging. Again, not getting too detailed here, but on DTI sequence we are able to measure the microstructure of the nerve.

We actually can tell if the nerves are built properly or they're damaged. And this is done on the microstructure, level. That's on the brain MRI side.

Another imaging modality we use is brain Spect, which measures measures the metabolism. We can actually tell each part of the brain is it functionally normal metabolism or it's reduced metabolism.

And after treatment, I can tell if I improve metabolism in this area, in those areas, I know if they're correlating with the clinical improvement that may or may not have happened.

It says, I mean, you're saying this and I'm shaking my head because this is so radical and so innovative and so important. Anybody that knows and aunt and uncle, a grandparent, a relative, a friend that had a stroke and just never improved.

And here we have something that might help. I have to spend two minutes on cognitive function. You know, of medical. If you do scientific, your work, you know, got worldwide headlines for people with early cognitive impairment.

The possibility of the spot is a supportive therapy to avoid the full consequences of dementia. So just give us a couple minutes of where you're at in that, you know, cruel illness.

Perfect. So exactly like like you said we had and I like to to divide those two populations. We have the rehabilitation population that we mentioned stroke patients, traumatic brain injury patients, PTSD patients, chronic pain patient patients, where we focus on rehabilitation of those either motor function or physical function, or cognitive function.

On the other side of this equation, we have been handsome and population, and we have started a program after a successful randomized controlled trial of healthy aging.

We all know that aging, some don't call it a disease, some do call it a disease. The W. H. O. actually, calls aging a disease. But we all know that is associated with functional decline, whether it's the cognitive decline, whether it's the physical decline or any other organ decline.

So that led us to into to start that healthy aging program where we try to enhance the cognitive function or the physical function of an aging patient.

And this we're talking about, again, normal aging that is caused just by the fact of time. We're not talking about a specific pathology. And we have shown very successfully that anyone above a certain age and again, fitting our criteria of patient selection, we are able to enhance cognitive function, physical function.

But more importantly, we are also have shown improvement in aging biomarkers such as telomere length, such as senescent cells. And again, not getting too much into the details.

These are biomarkers that show we are actually affecting the aging process. That's again, these are like literally pearls just coming out of your mouth.

They're so profound and they're all backed. And you know, you're you're the scientific head of I've read the papers and I mean, this is not a cancer. This is work.

Healthy Aging and Cognitive Benefits

You're doing article by article, piece by piece. So in the last few minutes, we have to just talk about the heart. And I remember reading, I think, 2018, a paper professor of frailty published that hyperbaric oxygen therapy and people with heart impairment can actually raise the ejection fraction, the measurement that cardiologists use, that so many patients listen to this, which was higher, you know, go in a hyperbaric oxygen chamber and enjoy a stronger heart.

I think you guys are continuing some cardiac studies that aren't yet published, but maybe a couple minutes on hyperbaric oxygen therapy for cardiac performance, cardiac strength, cardiac health.

Perfect. So, yeah. Well, we started this was part of the, the aging trial that I mentioned earlier that we wanted to see how do we affect, the normal aging heart.

And we have shown that we do improve certain parameters in cardiac contractility, meaning we are able to improve

cardiac function. We also did it, like you said, on patients with chronic, cardiovascular disease that cannot be further treated with catheterization or other interventions.

We have shown we are able to increase and improve cardiac function there. And just recently this is still under, review or the latest, data we have in long Covid patients, that we have treated and we have published about improving their cognitive function of long Covid patients.

But recently, we're about to publish that we are improving their cardiac contractility as well. And like like like we discussed earlier, this all goes back to the heath one alpha.

And the fact that we are harnessing the ability of our body to repair itself. So I do not know the Hebrew word for switchblade. You know what the switchblade is. Yeah, yeah.

So it sounds basically like hyperbaric oxygen therapy is a switchblade. We can pull out stroke, we can pull out cognitive impairment. We combined healthy aging.

We combined cardiac impairment. We haven't had time to talk about PTSD. Some amazing work you guys have done in the autism spectrum and childhood developmental disorders and, probably not in long haul Covid.

All these have made headlines all over the world. So, I mean, we got a lot of people interested right now. Number one, they definitely think you're the cutest Israeli they've ever met.

So thank you for that. Yeah, I know, and you come out with the doctor, head down and calendar, you let us know. But I mean, for people that want to know more, if they want to know about a scientific, they got to go to PubMed.

But if they want to know about, you know, some people will say, I'll travel to Florida and spend 12 weeks. I'm concerned about my health. How do they find more about, you know, the parent clinical company?

Perfect. So we have a website of clinics.com, talking about both of our, clinics and all the information how to contact docs.

Heart Function, Long COVID, and Other Uses

But more importantly, it also has a scientific, tab that you can read all about the publications, both in layman term as well as going into, the regular, publications and read the actual publications, at your own level, and read all the data we have.

We really want everybody to know about these studies and the data that's already accumulated. And it is really pretty impressive. And why this is, evidence based medicine.

But we do I, I just wanted to touch about the Swiss Blade because this is a really great point. And I'll tell you why. It is a Swiss blade. And the major thing we like to look at those diseases, whether or not we have a wound where they're like, just like we started to talk on diabetic wound.

We want to know if there is a brain wound or a cardiac wound that in the heart of it has ischemia or low metabolism. That's the common denominator of all these diseases, a wound that is harder to see because it's not on the limb, it's on an internal organ that we cannot see.

But if we are able to prove that there is a wound, and again, during different imaging that we are able to affect this wound, that's why we can affect it with age of Beauty. Wow.

Let me just ask for the guys out there that are listening. I can't imagine this is anything but beneficial to erectile dysfunction for all the same reasons you have shred shredded data, even an anecdote.

If you have a really happy man in Tel Aviv walking around with a smile. We have done, a small pilot on that, on

erectile dysfunction, and we have published this, and we have done actual MRI imaging on this, patient to, to prove that we are improving perfusion there.

So definitely that is a valid point. Okay. Interesting. Because, you know, the body is a, network of similar systems of pathophysiology. So it should improve. Well, that's wonderful.

And I don't want to leave the women out. But typically when we talk about sexual dysfunction the conversation is the science of male issues. But so thank you so much, Amir.

For anybody listening, he is married. He has kids. Just leave him alone. Even though he's just a wonderful, wonderful guest to, discuss with. And he's got a scientific future that's so bright.

Do you want anybody to contact you or just have them go over to the avivclinics.com?

Clinic Access and Closing Remarks

So definitely, please visit our website, but my personal email Emirate of scientific.com. If someone has a as a question want to reach out, I'll do my best to answer it and direct you to the right, answer and help as much as I can.

Our our our goal in life, at least mine is to do good. And whoever I can help, I would love to do that. Thank you. That's very kind of to share that. And just in case anybody doesn't know the word, Aviv Avivclinics.com, the Hebrew word for spring.

Hope, future promise. All the things we're talking about in the medical world. So I just got to give you a big shout out of gratitude. And your mother must be very, very proud of you.

I'm very proud of you. I'm old enough to be your father. But anyways, thank you very much. And we'll catch up soon. Hopefully in Florida, Israel, maybe Dubai.

Okay. Thank you so much for having me. They will.