Hyperbaric Oxygen Therapy: The All-In-One Therapy For Heart Disease And Cognitive Function Transcript

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Introduction to Hyperbaric Oxygen Therapy

– Alright, everybody do not move. We've got one of the best interactions that there's going to be at this amazing summit Reversing Heart Disease Naturally because sometimes we get the opportunity many times to bring the top dog, the big kahuna, the scientists, 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 gonna relate hyperbaric oxygen therapy to heart disease and other conditions. But we're not bringing anybody.

We're bringing Amir Hadanny, MD 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 Harvard research fellow in the brain modulation lab in the last few years, trained as medical doctor in tel Aviv PhD in bio informatics 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 in a medical center in Israel joined Aviv scientific and we're going to learn right now about what is Aviv scientific, but as a worldwide company I'm very familiar with.

I've had a wonderful time in the past interviewing, shy a friday 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 Dr. Joel Kahn, thank you for having me a 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 were going to really reach.

A lot of people could be more. We're hoping, you know, for a 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 tell us about is you know, for the public. I mean what that means.

How HBOT Works and Its Medical Origins

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 this is exciting. – So exactly like you said, h bot 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.

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 and reaching the tissues. And we're talking about a lot more.

Almost 30 times more than what you and I are right now breathing well. – So my very, very rudimentary understanding is people all over the world during the pandemic bought an oximeter they put on their finger and it shows that your red blood cells are 98% saturated with oxygen. Okay, maybe Make it 99.

Making make it 100. But you can't do much more than that. 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 masks were 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 didn't dive the proper way and had some accidents eventually had to go inside uh 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 call them. The bends or decompression sickness is we call today due to some issues with their diet.

A couple of years afterwards, they discovered the 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 food 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 necrotic and will probably have to amputate that limb. Another very common use of H bot again for years and years now has been radiation injury meaning patients who underwent radiotherapy due to different oncological or um 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 um to help that with H bot and practically speaking, H bot is the only treatment for radiation injury. The only thing that we know that can help moving forward down timeline we still had it for those two main um 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 who was an astrologist back in the days. Found out due to several case studies that patients who had those diabetic food that were treated with H.

B. O. T.

Chamber Setup and Treatment Protocols

And concurrently had a neurologic disease such as a stroke. We're actually improving to the H. B. O. T. They were giving for the wound, they were actually improving their stroke symptoms and that was phenomenal.

But again when both shy and myself talked about it and review these cases, we were saying, okay 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 empirical tools that H Beauty can help stroke patients.

And that was the first of many studies that we've done to study the effects of H bot in neurological disease. – Well that was incredible and I don't know if my memory's right but prior to Professor shy afraid E of in tel Aviv professor and nephrologist I think in the United States are about 13 medical indications where 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 won't know hyperbaric auction 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 wall chambers. I've had patients by 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 thick walled multipurpose kind of community hyperbaric oxygen sort of like a sauna.

But it's Asana for you know 12-20 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 looks 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 actually looks like an airplane.

So each one has each one of the clients has his own seat comfortable seat like a more comfortable. I would say that common commercial airlines probably. And the close 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 10 m below. The level of the c. So that's two atmospheres. And just like you said to atmosphere is very hard to achieve in any of those uh soft wall or different sex you may find on the internet Ebay or whatever website you may look for, you usually cannot uh get to that pressure.

And also most of these different products cannot supply 100% oxygen which is the other component.

Stroke Recovery and Patient Selection

And the third part I really want to stress we haven't touched yet but especially what we have done in our studies and then implemented in our company of the clinics that you've mentioned. We use a specific unique protocol.

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 tricking the body to feel like it's under stress like it needs to repair itself. This is a very unique concept we call hypoxic hypoxic paradox. Hypoxia is low level of oxygen.

Hypoxia is high level of oxygen by doing those fluctuations were causing the body to think that it's under low level of oxygen and induce several pathways of repair of brain repair of 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 gonna I'm gonna come to the villages in Florida, I'm gonna travel to tel Aviv or maybe go to Dubai, which, to my knowledge of the three places right now, I'm gonna 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 um and how often am I going to fluctuate from 100% oxygen back to room air to facilitate this stress on the body. How often does that happen?

– So, usually the the unique protocol we use is usually at two hours duration. And we do the fluctuation every 20 minutes to do five times during one dive – 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 him if hypoxia induced double 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 you

said, it's hip one alpha or hypoxia 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 will give one example, we call angiogenesis, which is the creation of new blood vessels, meaning if you have high level of life 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'll have new blood vessels where you actually need it, – Wow, I mean, that sounds like some kind of vending machine, I'll put $2 in. I want more blood vessels to my right leg.

I mean it's crazy. So you're Aviv scientific and avi view. And No 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 the company.

I know it more is Aviv medical that is really pioneer during the delivery of hyperbaric action therapy. And these specific protocols to people who can get to a senator. I mentioned Florida Tel Aviv and Dubai this wonderful Israeli a 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 auction 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 wanna um 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.

Brain Imaging and Cognitive Aging Research

And then we start the program. However and I think that's that's the key lesson of the day and 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 and physical function. We want to assess if this patient is suitable for this program and really benefit will he or she benefit from the program?

Patient selection is the key element of H. B. O. T. And I cannot stress this enough because I know like you said 500,000 people are listening to this are gonna google H bot 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 H bot. They may go but not all of them will benefit from it.

You have to have professionals who are doing the right assessment in order to predict if this is going to benefit you at all. – And this is really key.

It's not an easy protocol when 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 M.

R. I. Data. What do you see? Is it better blood Flow on M. R. I. Or better brain function and memory? – 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 unfortunately today. But apparently more than 50% of stroke patients suffer from cognitive dysfunction. So the cognitive function of stroke survivors is really important to discuss.

As for the brain M. R. I. Imaging. We have two types that we usually do. We have brain M. R. I. That we can look at brain profusion and there we are able to see new or improved brain profusion due to the new blood vessels that we talked about earlier. From the angiogenesis.

Another sequence of M. R. I. We call D. T. I. Or diffuse tensor imaging. Again not getting too detailed here but on D. T. I. Sequence we are able to measure the micro structure of the nerves. We actually can tell if the nerves are built properly or they're damaged and this is done on the micro structure um level that's on the brain. M. R. I. 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 functioning normal metabolism or its reduced metabolism and after treatment I can tell if I improved metabolism in this area and those areas I know if they're correlating with the clinical movement that may or may not have happened. – You're saying this and I'm shaking my head because this is so radical and so innovative and so important, anybody that knows an aunt, an 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 Aviv medical Aviv scientific, your work, you know, got worldwide headlines for people with early cognitive impairment.

The possibility of H bot is a supportive therapy to avoid the full consequences of dementia. So just give us a couple of minutes of where you're at in that cruel illness. – Perfect. So exactly like you said we had and I like to to divide those two populations. We have the rehabilitation population that we mentioned stroke patients, dramatic brain injury patients, PTSD patients, chronic pain patients, patients where we focus on rehabilitation of those either motor function or physical function um or cognitive function.

On the other side of this equation, we have the enhancement 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 the disease do call it the 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 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 feeding our criteria of patient selection.

We are able to enhance cognitive function, physical function.

Cardiac Benefits and Emerging Applications

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. – These are like literally pearls just coming out of your mouth there so profound and they're all backed and you know you're you're the scientific head of Aviv.

I've read the papers and I mean this is not a concept, this is work. 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 paper Professor friday published that hyperbaric action therapy and people

with heart impairment can actually raise the ejection fraction.

The measurement that cardiologists use that so many patients listening to this wish was higher. You know go into 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 of minutes on hyperbaric oxygen therapy for cardiac performance.

Cardiac strength, cardiac health. – Perfect. So, yeah, well, we started this was part of 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 contract ill Itty 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 reviewer. The latest data we have in long covid patients um that we have treated and we have published about improved their cognitive function of long covid patients.

But recently we're about to publish that we are improving their cardiac contract illit e as well. And like like like we discussed earlier, this all goes back to the hip 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 switch plate is. So, it sounds basically like hyperbaric action therapy as a switchblade.

We can pull out stroke. We can pull out cognitive impairment. We can pull out healthy aging. We can pull out cardiac impairment. We haven't had time to talk about PTSD some amazing work you guys have done and the autism spectrum and childhood developmental disorders. And I'm probably not in long haul.

Covid all these have made headlines all over the world. So, I mean, we've 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. When you come out with the doctor had Donny calendar, you let us know. But I mean for people that want to know more, if they want to know about the scientific, they got to go to a pub med.

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 aviv-clinics.com talking about both of our clinics and all the information how to contact us. But more importantly, it also has a scientific tab that you can read all about the publications, both in layman terms, as well as going into the regular publications and read actual publications that 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. 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 that we like to look at those diseases whether or not we have a wound whether like just like we started to talk on diabetic wound.

We want to know if there is a brain would or a cardiac room that in the heart of it has ischemia or low metabolism. That's the common denominator of all these diseases.

Clinic Access, Research, and Contact Information

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 H. B. L. – 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 a shred of data, even an anecdote. 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 um and we have done actual M.

R. I. Imaging on this patient to to prove that we are improving profusion there. So definitely that is a valid point. – Okay interesting because you know the body is a network of similar systems of path of physiology 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 Avivclinics.com.

– So definitely please visit our website but my personal email amir@avivscientific.com If someone has a has a question, want to reach out I'll do my best to answer it and direct you to the right um answer and help as much as I can. Our goal in life is mine is to do good and whoever I can help, I would love to do that.

– Thank you. That's very kind of you to share that. And just in case anybody doesn't know the word Aviv A V I V clinics. 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 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. – Be well.