Beating the Odds: Dr. Larry Carr's Recovery from Near-Suicide and Brain Decline Transcript

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Introduction and Dr. Carr's Background

Every football player, every athlete, every person in collision type activities needs to have this in their locker. This is Doctor Talks. Real talk from real doctors on the issues that matter to you most.

Welcome back to the Think Well, Age Well podcast. I'm your host, Dr. Heather Sandison, and I am delighted to have the honor today of speaking with Dr.

Larry Carr. He's a respected physiologist, educator, and researcher whose work is helping to transform how we approach brain health, aging, and recovery from brain injury in particular.

Dr. Carr currently serves as an adjunct professor at the Department of Neurology at the University of Utah, where he brings decades of experience in biomedical research to some of today's most pressing challenges in brain health.

He's focused particularly on traumatic brain injury and its long-term consequences, especially among athletes, inspired by his personal experience as a football player.

One of his most impactful collaborations to date has been with Brigham Young University's football team and athletic department, where he's been partnering on research to better understand the effects and benefits of interventions when it comes to repeated head trauma and how we can relate this to later in life decline and neurodegeneration.

Through his work, Dr. Carr is helping to bridge the gap between science and real world solutions, advocating for prevention, early detection, and compassionate care, plus real outcomes.

Today we have an exciting conversation to share with you about what he's learned from working with athletes, what he's learned from his own personal experience, and what gives him hope for the future of Alzheimer's, CTE, and dementia care.

His unique perspective is one that can't be missed. Please join us. Welcome, Dr. Carr. Thank you. Pleased to be here. You've had a long and impactful career in this area, but you also have personal experience.

Would you start with just kind of sharing with us your personal experience of being an athlete and experiencing head trauma of your own? I started playing tackle football when I was 10 years old.

I played for the next 15 years through middle school, through high school, college, and a couple of years professionally in the CFL. I always was on the field.

I was a linebacker and center in my positions. At BYU I was very active. I'm in the Hall of Fame at BYU. The only one that did not play in the NFL, I played in the CFL.

So I was very productive, thousands and thousands of head hits that took a toll. I mean, I love the game. I love football. It gave me a lot of identity, a lot of success, but I paid a big price.

Ten years ago, I was diagnosed with severe brain damage by a neurologist. Most probable cause was football and the head injuries from that, probable CTE.

But that was preceded by years and years of declining health, both emotional and cognitive. Uh, my wife, bless her

soul, paid, paid a heavy price. I obviously I didn't never was violent with her, but I was, I had a lot of rage in me.

I was jealous. I was inconsistent. I was paranoid. There was really a lot of really, really dark, dark times back then. And that followed me until about 2018, where my wife and I, how we got through those next few years is difficult to say, but we did.

But we found ourselves in Boston for a short period of time, actually about a year and a half we were there. Finding ourselves in Boston, I had done previously, I had done some research on CTE because of my diagnosis and realized that Ann McKee was at Boston University and was one of the major voices in CTE and in the diagnosis of and defining its characteristics and such.

We talk here a lot about dementia generally, but also about Alzheimer's. So can you describe the characteristics of CTE, what it stands for, how it fits under the dementia umbrella?

CTE is chronic traumatic encephalopathy. It is a relatively newly identified disease. Most people have seen the movie Concussion with Dr. Amalu who discovered it.

It's related to earlier the disease that boxers experienced for many, many years. So they knew that it existed, but it's a relatively new, identified, separate form of dementia.

It's a neurodegenerative disease. It's not Alzheimer's. others, but Alzheimer's and a lot of the neurodegenerative diseases follow very similar patterns.

Personal History With Football and Brain Injury

They have similar mechanisms and such. So CTE is an ongoing disease. There is no cure for it. There's no absolute diagnosis for it until after death. But a lot of people have heard of it because of the suicides and major football players especially.

And that's what I probably have and will always have. And so encephalopathy refers to the swelling in the brain. So there's some swelling in the brain that leads to changes in cognition, but there's also this particular characteristic of CTE that is behavioral change that you alluded to, that you were experiencing, where there's more aggression, more rage, and sometimes violence, and sometimes suicidality.

These are things that maybe people have heard some of these stories. And also, we know that multiple brain injuries can also put us, even one brain injury, can put us at higher risk for developing many forms of dementia, including Alzheimer's.

So it doesn't just mean that playing football leads to CTE, but there are multiple types of neurodegenerative courses that the brain can take when it's had these types of injuries.

Would you agree with that? I agree with that. As I said, I'm not a neuroscientist. I can't give you a specifically full definition and the specific differences between the diseases, but they are neurodegenerative.

That means they're degenerative. They continue on. And as of right now, there's no cure, although I've found some things that have really changed the course of my life.

Amazing. Okay, I want to hear about that right away. What changed the course of the disease for you? And, you know, even just my experience of chatting with you here today, you're very cognitively with it, of course, and you're still very engaged in research and in your work.

So I'm sure a lot of people want to know, what is your secret, Dr. Carr? I found it about seven years ago, like I say, when we were in Boston. My wife and I were there.

specific assignment. We were living in a thousand square foot apartment. One car, 24-7. My wife actually, it was

her idea to go here to maybe helping my progression or my healing, so to speak.

But it wasn't working. It was going downhill really fast. And one evening, my wife came to me in tears saying, it's just, it's not supposed to be like this.

We've been married for 53 years right now. At that time, it was like 47 or 48 years. And it just broke my heart. I mean, I just, it's a disease that you know what you're doing.

There's a separation between your mind and your gut, the best way I can describe it. You know that you're making someone unhappy. You know that I can even see fear in her eyes at times.

terrifying for me also. So at that point in time, we had visited with Dr. McKee earlier, several weeks earlier. And after spending time with this, she said, you probably have this disease, but unfortunately, there's nothing that we can offer you.

We visit with family members, we study the brains, but there's really nothing we can do for you now. just go and live your life. And we left there pretty depressed.

If I could live my life, I wouldn't have been visiting with her, right? After that time, after that interaction with my wife, I sat down and I emailed Dr.

McKee again and I begged her in an email, is there anything, anything at all you could give me? Because I just can't go on like this. She responded and referred me to a 12th floor, small crowded office on the VA in Boston.

Dr. Naser was doing some research with using near infrared light and she was using it with Gulf War vets who came back with suffering from Gulf War illness and some brain injuries.

And she said that there was some pretty good success they were having. So I visited with her, I understood the physiology as she went through the mechanisms that potentially were involved.

I had no other choices. So I said, sure, let's do this. And so I started a six-week program of going to the hospital three days a week, having these big giant infrared lights put on my head.

They were hot. They were powerful. But within about three weeks, my wife said she noticed some changes happening. I wasn't quite as angry. I wasn't so easily upset, things like that.

I didn't believe it. I thought I was just imagining it. It was a placebo or whatever. But after six weeks, I went back in and we did the full testing, 10 hours of neurocognitive testing, scan data and such.

And I went back to and visited, went over our results, and they were so excited. They were jumping up and down, basically. I improved on every single test.

My PTSD was off the charts to start with. It was down close to nil. Depression was close to nil. My cognitive testing, my memory, my executive function, all these tests were really, really great.

My scan data was good. It showed changes in functional connectivity that correlated with the changes in my cognitive neurocognitive testing. Well, the next phase of the test was to go off it for six weeks and we were really kind of scared because we got me coming back to where I used to be and now I have to go off it.

So I went off it. And after six weeks, my wife noticed that I was going right back where I started from. She was scared to death, but we went back in, got tested.

And sure enough, my tests were right back to point zero. Sometimes not quite back to that point. A couple of tests were worse than they were before, but it showed a very significant pattern.

Where they increased, they improved, they went right back down. And so at this time, I started using an at-home device, which was the V-Lite early headset.

The changes weren't quite as quick, but they did start to come back. And we went back in and got tested right before we left Boston. And sure enough, the results were right back up.

I wish I had the graphs to show you, but they were significant. and it made a difference in my life at that point. At that point in time, I loved the sport, but I was really conflicted because not only did I love the sport, but it was the sport that almost brought me, caused me to not be here.

I mean, there's a lot of people that didn't make it. Why I was able to make it, why I was able to survive that, I don't know, but certainly could have lost my marriage and lost my life.

So I was, Maya was committed to saving football. You know, I mean, my wife looked at me and laughed at me. But you know, for a hundred years, football has known about head injury.

I mean, It was boxing, it was concussions, it was whatever. For a hundred years they've known about this, and in the course of those hundred years, what have they come up with?

Nothing. They have no changes in the game. They try to change the rules, which are ineffective. They try to slap a a $5 pad on the outside of a $1,000 helmet, think that that's going to do anything at all, which I don't believe it does.

Studies have shown that it doesn't, but you see all the teams wearing these caps on top of their helmets. And it does not change the fact that the brain gets rattled in the head when you change acceleration or momentum.

CTE, Dementia, and Early Symptoms

So anyways, football needed something and it still needs something. They're slow to respond. So I visited with the athletic director at BYU. His response was, sounds too good to be true.

I said, you're right, it does sound that way, but here's my data, here's the thing. And I've got 4,000 plus Studies documented the biological changes that this causes, you know, this is not just me by myself So he listened to me and but I knew at that point because I talked to other people and they'd pat me on the back and And say well, I'm glad you found this.

I'm glad it worked for you But you know everybody has something everybody has a chiropractor or this Supplement or that supplement that they they quote swear by so I knew that I needed to validate this and And so I got introduced to Dr.

Elizabeth Wild, who's the department chair at the TBI and Concussion Center at the University of Utah. She's been doing this for 25 years. She's one of the top neuroscientists in the world, hundreds of publications.

She just transferred jobs from Baylor to the University of Utah, and she agreed to meet with me. And so I talked to her, and I've since found out that she was very interested in my results.

I showed it to her. But she had never heard of it. And she actually thought it was kind of crazy. But she's a great person. And she was willing to research it and look into it.

And that started our journey. And that was about five years ago. Since then, we've completed three research projects, one with first responders, one with ex-football players, or actually ex-athletes who were involved in many different collegiate sports.

and one on the 2021 BYU football team that actually had a control group in it. And there's been some many publications have come out of it. But we feel like we've found a truly a sea change in the way football needs to address brain injury, a real paradigm shift in this.

And it's kind of hard to get people to listen to us. I'd love for you to talk us through the research and let's take them one at a time. Would you start with the control trial with the University of Utah football players that you did in the 2021 season?

Take us through how you designed the study and then what the outcomes were. Well, it's really a simple design. We had a control group of 15 and an active group of 15. They were volunteers, the head coach.

To get a head coach to agree to let you study their players is really significant. They don't want to do that. They don't like to allow outsiders into it.

Luckily, I wasn't an outsider. I had played there. And so I think that opened the door. We had assured him that there would be no negative effects to this because of the research that had done up to that point.

with the benefits of this. There'd been no negative side effects using this device, so he let us go at it. And we tested them before the season and right after the season.

We looked at several emotional, cognitive, and performance measures, as well as did some very detailed scan data on them. And the results were shock. What was the intervention?

How often did they use the… Oh, I'm sorry. I'm sorry. The intervention was to wear a V-Lite headset three days a week for 20 minutes. They just did it in the training room.

The trainer kind of oversaw it. Compliance was very good. The control group wore a headset that started, but then turned off without their knowledge. The treated group wore a headset that treated them the entire 20 minutes.

That was it. They just had to wear that headset three days a week. Probably, I would guess it would probably end up being closer to two and a half days a week, but that was the protocol.

And through the entire season, the entire football season? During the entire season, yeah. We did it after their last game. We tested them again. The results are unbelievable.

And I say that because nobody would believe it if we didn't actually show them the scan data and the clinical data. What we found was the clinical data, 10 different performance measures, cognitive measures, emotional measures, strength measures.

The treated group improved over the control group in 10 out of the 10 measures. In many of them, they actually improve going from pre to post, which if you know much about the sport of football, the goal of a strength and conditioning program is to minimize the loss.

You're going to lose strength, you're going to lose focus, whatever it is, but you try to minimize that so that they're still performing at a high level at the end of the season.

We found on several of these measures, they were actually better improved over the course of the season from the pre-testing. And that's, that's the treated group, the untreated group.

They did worse in every measure from the start to the finish. Wow. Well, I mean that the power, power. laws there are significant in that that just doesn't happen to that level.

But still people will say maybe it's biased, maybe they were incentivized or what have you. But the bottom line is the players that wore the headset were better players at the end of the season.

They were better people. They were better students. They were better in just about everything. Now, the scan data, that's another thing altogether. So we looked at the scan data.

Near-Infrared Light Therapy and Recovery

I'm not a radiologist. I'm not an expert in this. But I can tell you that at the end of the season, the untreated group, their brains were inundated with inflammation.

The inflammation, and this is DTI scanning. It's a relatively new technique. But you could see it's color-coded and you could see that the inflammation was identified throughout the entire brain.

The cerebellum, the cerebrum, all throughout the brain. There was nothing but an inflammation in that. There was also significant damage to the axons in the white matter.

The gray matter, the functional connectivity was kind of messed up in terms of it was, it was like going down the road and running into a detour and having to turn and go there to another detour and go in there.

Whereas now the treated group, that was a whole different story. The treated group had no new inflammation over the course of the whole season. In fact, they had a net loss of inflammation from prior seasons.

Nothing has ever shown decreased inflammation over the course of a football season. They had no damage to the axons, no repair mechanisms that had kicked in.

It showed nothing there. So as far as connectivity, it was more like a normal brain and normal connectivity where there wasn't. the delays in processing and such like that.

So I mean, we've got the data, we've got the proof, we've got the scan data. I presented this to one strength scientist at a professional team, and he flat out said, I don't believe it.

I don't believe that that's the case. And I tried to tell him, do you really believe that these researchers would put out data risk their 25 years of credibility, risk their jobs, risk everything that is sacred to them, that doing good research in order to impress you.

I mean, it just doesn't happen that way. The data is the data, and they went over it two, three, four times over the course of a full year, a year and a half, just looking at the data, making sure that it was accurate, making sure that it was valid.

And the bottom line is we've got, just from wearing this headset three days a week, a football player that's got a healthier brain looking at the measures that we measure at the end of the season than they did at the beginning of the season.

Now, what the NFL, what the NCAA is doing is they're hoping to get a, they're hoping to minimize the damage that occurs. Because all the CTE research shows that the more years you play, it's cumulative.

The higher the risk is of getting the disease and the worse of getting the disease. So it's an accumulated problem. And we saw that in the untreated group where their inflammation, there was still residual inflammation before the season, and it was inundated after the season.

The treated group, their inflammation was nonexistent. One question on everybody's mind is how did they play? How is their season? Well… That's a really good question.

If you look at the head coach at BYU, he's been there 10 years, and if you look at all of the years, his win-loss record, taking out the two years that they used the light, because they also used the light last year.

Yeah, I was going to say, I hope that the head coach decided to use that going forward. Well, his win-loss record was, as I think, about 58%, which is okay.

It's not great. It's not going to get you a long-term contract, I don't think. But if you just take those two years that they use the light, their win-loss record is about 89%. I mean, the year we researched them, they were, I believe, 10 and 3. Last year, they were 11 and 2. And they were just one play away from being in the national

championship playoffs.

Now this is a team that had no draft choices. They didn't have any first team All-Americans. They didn't have any gamers, so to speak. They had great players, but not one of them was worthy of a draft pick.

And so you've got a team that is one of the top teams in the country with no draft picks, 11 and two, one play away from the national championship playoffs.

I can't say that that's due to the wearing the light. I'm not going to say that. But I can say that it certainly didn't hurt their performance. And did you notice, or did the researchers pick out any athletes that had concussions?

I mean, we assume everybody's getting their head rattled if they're playing football for a season, but was there anybody that had a particular event, loss of consciousness, a particularly bad head injury, who was in the treatment group where the results were maybe different from what would be expected?

I don't know exactly that, except that they did do a measure, a sideline measurement in terms of concussion symptoms, and the symptom levels of the treated group were much lower, significantly lower than the untreated group.

So, I mean, that's a good point. Now, personally, I don't love looking at concussions because I think it's a misnomer. I think it's a cop-out, so to speak.

for the NFL user concussions because they say, well, last year we had this many concussions, this year we have so many concussions. Concussion is just a point along that spectrum of brain injury where we see symptoms.

Okay. What football player in the right mind, unless they were knocked out on the field is going to come off the field and say, I think I have a concussion.

There's not anybody. I played for a lot of years and there was a lot of times where I was knocked out briefly. I would be stunned. I would have temporary amnesia or I wouldn't be able to call the signals.

And not once was I diagnosed with a concussion because I never wanted to lose my position. I never wanted to be taken out of the game. And that is the biasness in using concussions as a measure.

What coach really wants to say, Hey, you look like you've got a concussion. Come over here. Let's take care of it. Oh, by the way, you might be out for three weeks if we find something there.

It's just not going to happen. If that was their main goal, there would be accelerometers in the helmets, there would be force plates, there would be measures that would identify concussion-worthy hits.

And they don't have that. And players aren't going to admit that they have concussions. And the diagnosis is very sketchy at best. So I don't, I don't believe whenever they look at statistics with this many concussions or that many concussions, I just, I just kind of put it to the side and you can ask any football player.

They, they don't admit to having concussions. They don't admit to wanting to come out of the game. It's, it's across the board. I was talking to one coach and telling him about this research and he said, well, yeah, but our concussions are down 25%. And I go, well, okay.

The trouble is, concussions have no relationship to CTE. So even though you think you're doing a good thing, which I give you credit for, it's not doing anything to lower the risk of CTE.

Is there a clear way to detect when the cognitive issues are related to these repeated head traumas that maybe might not be classified as a concussion?

Just testing. Just cognitive testing by experts and such. They have different tests that they can give the players that

have been developed. I don't know how accurate they are.

I don't know how valid they are. And we're looking at kind of the long-term health benefits. When you really look at the benefits, Of having the players use this light technology.

All of the other worries kind of go out the window because if, if, if we prove through we've got another FDA trial starting in another month or so, but if we, if we validate what we've already shown to be the case.

In my mind, we solved the brain injury problem for football. That will bring a lot of other parents into the game, a lot of other kids into the game. I just feel that we're on that course.

BYU Football Study and Season Outcomes

And that's big news. Yeah, that's huge news. You talked about some other applications as well, though. You mentioned first responders and doing a study with them.

Can you speak to that, how the study was designed, what the intervention was, and then the outcomes? Intervention was the same. They wore the headset three days a week.

We didn't have any scan data with it. It was just a pilot study. We looked at Las Vegas, a very active group of firefighters. They wore it three days a week, like I said.

We didn't have any control groups. Firefighters, they have a rough job. A lot of PTSD, a lot of divorce, a lot of suicide. In fact, there's more deaths from suicide than there are from fires than firefighters.

So they don't sleep well. I mean, they have a lot of stress in this job. After the eight weeks, we tested them again. And the main researchers did the testing.

There were no assistants doing the testing. But they had tremendous results too. What were the primary outcome measures? Depression was decreased by about 20 percent.

PTSD was down about 30 percent. Executive function improved. Processing speed improved. Every single measure that would improve their performance as a firefighter improved.

They wouldn't give the headsets back after the study. They refused to return them. And so, I mean, they responded a lot like everybody. What do you mean this light is going to go through my head, my hair, my scalp, and my skull?

Yeah, it does. And we've got a lot of research. VLite has done, they've done so much research in this area. No other company, I don't get paid for selling VLite.

I just help them with the research and they do a lot of research. It's a very validated device and it does, it does do what we're saying it does. Can you describe, you're a physiologist, so describe a little bit of the mechanism and start with like, okay, what does it look like?

How do I put it on? We've talked about wearing it for 20 minutes. Is that normal? How many days a week? So if somebody's wanting to potentially use one of these, what would that look like for them?

Oh, great. You're going to bust one out. I love it. There's a device. This is a headset that goes on. These two lenses go to the back. They match up kind of with the cerebellum.

The front is on the front part of the head. These two lights on the side go on the sides of the head. There's also a nose clip that goes in the nasal cavity, which they've just released some data that shows that the The light from the nose clip penetrates down deep into the skull, into the brain down here, and it's very effective.

So they just wore this headset for 20 minutes, three days a week, and they had tremendous results. Do they

meditate while they're doing it? Can they talk while they're doing it?

They can do whatever they want. You can cook dinner while you're wearing it. You can watch TV while you're wearing it. You can be doing anything at the same time.

Okay, interesting. Now some of the research that we're looking at doing is to match this along with some more traditional therapies to see if it's synergistic with those, if it accelerates more traditional therapies.

But, you know, I've done this a long time. When I was first out of college, I did a lot of work with cardiac rehab. And these are people that are fighting for their life, that had a heart attack, that almost took their life.

And they have some significant lifestyle changes that they're trying to make. Diet, exercise, the whole bit. You want to lose weight. They were great for the first few weeks, but after that, they just fell off the wagon.

I mean, they just, making lifestyle changes is really, really hard. I agree with that, that it's just next to impossible. With this, you don't have to make any lifestyle change.

You put it on your head in the morning and you go about your day. As far as the effectiveness of this, it's unmatched. It's easy to use. You can take it anywhere.

You know, there's a lot of beds out there. There's other things that delivers lights and there's nothing that it can compare because there's a lot of barriers to its use.

Not the headset you can take that with you anywhere So, you know, I don't want to sound like I'm doing a commercial but when you get the results that we found What's the percentage of people that have mental health issues out there, you know, it's huge what 50%? We're talking about millions and millions of people.

I was interested in football because of my own path my own Experience going down the dark path black hole. And it's a really good petri dish to experiment with.

You've got these young, healthy people that exercise a lot. They try to take care of their bodies. But the only thing wrong with them is they beat their heads.

And so we can kind of isolate the brain damage associated with what they do on the field. And if this can mitigate that damage and have the success that it's had, that's huge.

It's huge. And that's what for other people. Well, yeah, and imagine what it could do if you wore it five days a week because we found that five days a week is better than three days a week.

And imagine what it would do if they started wearing it when they first started tackle football when they're 10 years old and wear it year after year after year.

I wear it, I've worn it for seven years now. My wife tells me she's got her old husband back, he's better than ever. I feel like I've got my mind back.

So a couple questions. One, is there any risk? Is there a potential downside? Can you overdo it? What if you did it seven days a week or twice a day? Could you be getting too much stimulation through the red light?

And what is the physiology or at least the hypothesis? What is going on? How does the light work? Well, it works several ways. To answer your question about too much, you can get too much.

I don't know if you can get too much from a headset like this. The power is adjusted so that it minimizes that risk. It's effective, and they're high quality lights.

Not all light is equaled. In Amazon, they have red lights, and there's a lot of difference in the quality of the lights.

There is a biphasic response though that you could get too much light if you use real powerful lights, and that just stops working.

There's no real negatives in terms of health issues. We've not found anything that is negative. There's been a few people that have claimed to have headaches.

There's been a few people that have claimed this or that, but it's really minimal. There's a center for PBM back east, and they've documented… PBM photobiomodulation.

Yeah, TPBM is transcranial photobiomodulation. They've documented over 100 million hours of use of this without any serious negative effects. I cannot say and I won't say that this is effective for everybody.

But we have had a really strong success rate. And when it is successful, it's usually successful. Statistically successful, we've got several papers that are going to be, that have either been published, submitted for publication, being under review, that'll be coming out very shortly.

And when that happens, I mean, I expect when the football study is published that people are going to take notice because this is huge. Can you imagine what the NFL would do with this data if they understood it?

I mean, headlines, football brain issues solved. Well, it sounds like you're going to make that happen. So the physiology, you're a physiologist. What is happening?

My understanding is Michael Hamblin, he was at Harvard for a while. He's published extensively on this. There's also Russian data, of course, has to be translated a little bit easier these days with AI.

But my understanding is that the cytochrome C oxygenase enzyme in the mitochondria does a lot of the heavy lifting in terms of using the light to optimize how we turn glucose into ATP.

Is that your understanding of it? Is there more to it than that? Well, Michael Hamlin was an author on my study. He was part of the group in Boston that published my results.

And I was part of three additional NFL players that had very similar results. So that was the first study on football players. But what you're talking about is within the mitochondria.

And in the mitochondria, that's kind of like what they call the powerhouse of the cell. That's what creates the ATP, which is the energy that drives muscle contraction and enzymes and all the chemical reactions that take place.

And so it seems that there is some effects on the cytochrome C oxidase level within the that system that transfers electrons, the electron transport system through that that creates the ATP.

They look at blood flow, seems to be improved. They look at the nitric oxide that seems to be part of this which affects blood flow. The improvement in the mitochondria.

There's a lot of mitochondria in the blood which gets affected, radiated by the The nose clip. So I read an article in the MIT research journal several years ago where they had identified light channels within the brain.

First Responder Pilot Study

Channels that actually transport the photons. And so I haven't seen a lot of work thereafter. It was very advanced work and kind of woo-woo kind of work, people thought.

But, you know, we can't describe. the reaction time and the movement of muscles and the performance in people just by the electrical impulses from the brain to the muscle.

The time doesn't match really. And so what happens in the brain with light and photons and such We'll figure it out.

Somebody will figure that out. But all I know now is that for whatever reason, whatever mechanism, light works.

The FDA just approved the use of light, PBM, for macular degeneration. They use it in cancer sores with cancer patients that end up with sores in their mouth.

That's a go-to treatment. So, I mean, they've known that their infrared light has biological benefits for many years, 40 years, and yet people still don't know anything about it.

I would guess that if you asked 100 people about PBM, 99 would never have heard of it before. And yet it's one of the most studied, most researched, most validated, technology that's out there.

At no risk. There's no side effects. There's no drug overdoses. There's nothing out there. I mean, so I beat my head against the wall trying to get people to listen, but it'll happen.

It'll happen. People will see this and it will explode. And that's exactly why we're here, Dr. Carr, is to have this conversation so that more people can learn about this potentially beneficial intervention that has very low risk.

As a clinician, this really stands out to me when I can recommend something that is cost effective, that doesn't take a lot. As you mentioned, it's very easy.

It's easier to put this light on your head for 20 minutes a day than it is to cook differently or exercise differently or change your social network. It's a lot easier to just put this on for 20 minutes a day, go about your day.

And so it's low-risk, cost-effective, easy to use, and there is really good data coming from multiple sources. I was so excited when Dr. Lu Lim and the group up at VLight was telling me about you, because I think when you take a cohort of study subjects who have repeated trauma, brain trauma, and then you can show this really distinct, significant difference in those who were treated versus untreated, it speaks volumes about what the intervention is doing.

And even if we don't understand exactly the details, when we can see the differences in these two groups, it really shows us that there's some promise here.

And it's probably worth adopting for a lot of people listening to help optimize cognitive function as they age, regardless of traumatic brain injury, history or not.

Absolutely. My wife uses it. She has a history of Alzheimer's in her family. I played football quite a while ago, but I'm not that old. I lost one defensive end from suicide.

I lost another defensive end. He was entered into a care facility, died of dementia. One, a little younger than I am, has been multiple divorces and is living in his car right now.

Very bright guy. I can go through a group of fifteen players that I played with and coaches involved and see that this affected ten or twelve of them.

How the Headset Works and Safety

And even the ones that tell you that I'm fine, if you really dig down deep into their situation, there's a lot of unhappiness, there's a lot of stress, there's a lot of anxiety, there's a lot of divorce out there.

I mean, people that played this game, that played really any kind of collision sport, are not their best selves. As good as they are, as good as they are, they're not their best selves.

And I try to make people realize this, That's a situation that we're dealing with. Did you work as a physiologist? What was your work there? I worked as an exercise physiologist and physiologist at a university for eight years.

After that, I started my own business. After that, I was so compromised. I was going downhill so far in my cognitive and emotional status, which I didn't have any idea what was causing this, that I ended up teaching middle school PE for 15 years before I found this in Boston.

It's not as exciting as an NIH researcher, but it's more realistic. I mean, when I said people are not their best selves, they're not their best selves.

What advice do you have for clinicians or families who are concerned about having had a history of head trauma and who might be at risk for developing long-term CTE or Alzheimer's, or even just as you described, like not living their best lives?

What would you tell them to do? Get a headset. Simple as that. Nothing more than that. Before the effects that I found of this, every researcher, every clinician would say the same thing.

Eat better. Exercise. Get more sleep. See a therapist. Go on and on and on about these things that don't have I don't want to say they don't have an effect, but I did exercise.

I was a physiologist. I ate right. I meditated. I was spiritual. I did everything that I was supposed to do and I just kept going downhill, downhill, downhill until the point where I held a knife to my chest for over an hour and I wanted to end my life.

You know, it just doesn't help. This is the only thing that I've found that has helped. And I've got it validated by many, many, many individuals, by highly respected researchers that have validated this and published papers based on this.

So people will hear about this. It's just a matter of time. It's so exciting. This is a really exciting time. I have told people if you are APOE 4, 4 positive, I wouldn't recommend that you play football.

I wouldn't recommend that you become a big wave surfer or take on jobs like firefighting or ER nurses or doctors because of the impacts on your brain and how susceptible you are.

It sounds to me like you've really made it part of your life's work to make football safe again so that we can say, you know, even if you have some risk, you can still enjoy the game.

Absolutely. And did you ever see the movie Concussion with Will Smith? I haven't seen it yet. Oh, you need to see that. But there's a part in there where one of the doctors, they're trying to squash this research.

And he works for the NFL and he made the statement, if 10% of the football moms out there believe this, that's the end of football. Well, 10% of moms did believe it and more, and they did take their kids out, but it wasn't the end of football.

In fact, there's probably been less talk about it these last several years, probably because of the NIL and the money that's involved. and the wild west nature of college football, even high school athletes are getting played nowadays.

Brain injury, CTE, the whole thing has kind of taken a back seat and that's too bad, you know, before I found this. It was really hard to justify supporting football.

I mean, you're basically telling your son to go out there, play this game, and, oh yeah, it's like playing Russian roulette. Maybe it's one bullet, two bullets, whatever, but it certainly increases their risk of not living their best self and possibly dying early.

Well, I mean, when you described it, it's worse than roulette, right? This isn't a 50-50 chance. You are sacrificing your brain and body when you go out and play this game.

You know, one thing we found in the scan data of the football players, and we scanned nine women soccer players, but that was during COVID, so we couldn't finish that study.

But what we found, their brains looked really bad. And in retired football players that have symptoms of CTE, They have ninety ninety two percent of them have what's called the CSP cavem septum pollution in their brain is right in the middle of their brain and it's not normal it's not common but it is different researchers.

Look at its maybe two percent to twenty percent in the normal population but in the football players was ninety percent. In Boston, Dr. McKee suggests that presence of a CSP is a major risk factor for developing CTE.

We found a CSP present in 95% of the football players. These are 21-year-olds that have the same red flag blaring warning, warning, warning that these retired football players have.

But what else we found, we found that that CSP was present in nine out of the nine women's soccer players. So every one of the women's soccer players had the same, this artifact in their brain.

And we don't know what the clinical significance of it is. But I believe what we feel is it's the result of the brain twisting and turning and banging around in there and that's the end result.

Broader Applications and Final Takeaways

So I don't know if the presence of that in and of itself is the reason why there's problems and it's been associated with severe mental diseases, mental disorders too.

But it's a red flag. I mean, extended period of time playing tackle football, starting at a young age and the presence of a CSP, there you've got three major risk factors for developing CTE.

So without some kind of intervention, pads on your helmet, changing the rules is not going to do anything. You have to treat it. And this is the only way I know that you can treat it effectively.

Well, what an exciting time. You know, we talk about in our work, my colleagues and I, that hopefully for my generation, I'm in my 40s, Alzheimer's can be optional.

And it sounds like your work is really, can we make CTE optional for football players and for soccer players and for anybody who enjoys sports that include getting repeated head injuries?

That this is a way to… You talk about millions and millions of people. And if it has an effect on mental illness, another group of millions of people.

Look at firefighters, law enforcement, military. I mean, we've had several military vets in this, and significant results with them. So I mean, this is a must-have.

Every football player, every athlete, every person in collision-type activities needs to have this in their locker. And even motor vehicle accidents, right?

Following a… We've had several that we've treated with that. Michael Hamblin, you mentioned him, kind of the godfather of PVM. He wrote one time in his book, he said, this is a performance enhancement device that cannot be detected.

You know, it is, takes performance to the next level in my mind as an exercise physiologist. How exciting. Dr. Carr, it has been such a wonderful conversation with you.

So eye opening, so brain expansive and mind blowing. Thank you for sharing both your vulnerability, your personal experience, as well as your professional experience and your enthusiasm, really your dedication, your devotion to the sport and the players.

It's been a pleasure to talk to you and to have you on the show. Thank you. It's been my pleasure to be here. Thank you so much for listening to the Think Well, Age Well podcast.

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