Doctor Lewis Background and Credentials

Doctor Michael Lewis is a proven leader, an expert on brain health, concussions and traumatic injuries, as well as a recognized innovator in infectious disease surveillance and epidemiology.

Upon retiring as a colonel in the U. S. Army, he founded the nonprofit Brain Health Education and Research Institute and into private practice, focusing on helping patients with chronic concussive issues.

His pioneering work in the military and since has helped thousands of people around the world. And he's regularly featured in the media, radio, podcasts, webinars, scientific conferences and television.

As a lifelong athlete, Doctor Lewis serves on the Pop Warner Youth Football Medical Advisory Board and the board of directors of the National Collegiate Rugby, who is also the head of the Medical and Safety Committee.

He's the author of the book When Brains Collide What Every Athlete and Parent Should Know About the Prevention and Treatment of Concussions and Head Injuries that.

Lewis is a graduate of the US Military Academy at West Point and Tulane University School of Medicine. As board certified and a fellow of the American College of Preventative Medicine and the American College of Nutrition.

Super excited to have Doctor Lewis come on and talk about concussive injuries and what it really means for brain health. I'm so happy to have you on. Welcome to the summit.

It's great to be with you. Yeah. We're gonna tackle, one of my favorite topics, actually, it's probably my favorite topic, which is, concussive injuries and traumatic brain injury and inflammation.

Only because that's my personal story. And I went through that before as well. Many, many of us have. Yeah, that's what we kind of got into integrative medicine.

Right. Yeah. And so but tell us a bit about, your background and, and how did you even get into this? I mean, you were trained in international and tropical infectious disease.

Like, how did you get into the whole concussive and traumatic brain injury population? Well, I've spent a career in the army, is the really short answer.

So, as you can imagine, you know, in the last 20 plus years or so, what the army and the military had to deal with. Well, let me back up for a half a second.

So I graduated from West Point, spent about five years out. It's called playing army. You know, airborne Ranger schools, things like that. Infantry divisions.

And then then went to medical school. Every intention of being a surgeon and, back then they would send you out and do general practice after I did a surgical internship at Walter Reed.

And then they put you out to do general practice. I discovered nights and weekends that, you know, that surgeons don't know anything about.

How He Entered Concussion Research

And, ended up in, you know, doing, residency and preventive medicine through the Walter Reed Army Institute of Research and Johns Hopkins. And that put me into infectious disease and international stuff, stationed overseas in

Southeast Asia for a number of years.

I was literally a disease hunter, in Southeast Asia when SA's and bird flu happened. And so I really I was that ground zero of all that. And then the Army says, you got this great experience.

Come back and teach the medical school and Bethesda military medical school, uniform service in university. So now you've got Iraq and Afghanistan going on, and you're on a campus military campus that you've got a lot of wounded warriors around.

You know, you know, the visible wounds that you see, you know, missing arms and legs and things like that. But what really started to come out around then, this was around 2005, 2006.

What was the traumatic brain injuries that we were now seeing from Iraq and Afghanistan? And, I had a number of good friends, you know, that were sort of developing and have become the literally the leaders in the army.

And my one, one good friend literally poked me in the chest, 4th of July picnic, like, would you're a doc, what are you doing about this traumatic brain injury stuff?

And I kind of put two and two together, and I came up with an odd number. I, as I put it, and I went to the head of research at the Defense and Veteran Brain Injury Center and said, hey, is anybody looking at the use of omega threes?

Like you would get some from visual to help our soldiers recover from traumatic brain injury? He thought about it for a second, and to his credit, he said, no, why don't you?

And I was like, I got no training. I, you know, I'm not a neurologist. I'm a neurosurgeon. You know, PM an hour or whatever, you know, and not a biochemistry.

I don't even remember the chemistry behind it. And, he goes, you're the only one asking the question, and I've got some seed money. Why don't you start a program and sort of look into it?

And so it was a very rapid learning experience, and, you know, who knows anything about it. And, and ultimately, there was only one person in the world that I ever found at that time, about 15 years ago now that really was looking at the use of omega three for traumatic brain injury.

And that was a guy named Julian Bailes. And if that name sounds familiar from, the movie concussion, for example, he's one of the characters, but it's a real life character.

And, and so I got to be friends with him and learn from him, but then also learning from people like Joe Ablin at the NIH who was looking at omega threes in a population level.

And he's a psychiatrist. He's looking at mental health issues. Right. And so just, you know, sort of one after another and really found that that group of, you know, 6 or 7 people who really understood, omega threes and neurologic injury.

And so it was amazing and a learning experience. And then people started asking, well, how would you know how you're applying this to people? And I started, you know, so that's kind of how I jumped into it.

And it I say it just sort of fell out of the sky and landed in my lab. Well that's amazing. So now that you've known a lot about it, you have a book on it, right?

I do, I kept telling as in fact, I, I did a radio, interview series for a while. I was around the time one of the Super Bowls and every radio host interview was that.

So when when can we get your book? When can you get your book? I'm like, it's coming out soon. And, so it's kind

of a little bit of pressure to that. I should write a book.

And it was really cathartic for me, actually, to get all this information out of my head because I go in and I, you know, doing talks at medical conferences and stuff like that might be 15 minutes, might be an hour, and there was never enough time.

I at one time it was a four hour. I had a four hour slot and it still wasn't enough time. All this knowledge I had accumulated, and so it was cathartic for me to put it out and get it into into a medium, that I could refer people to. So, it's the book's called When Brains Collide.

What every athlete and parent should know about the treatment and prevention of traumatic brain injuries and concussions. You can get one. Brains collide on Amazon, as is the easiest way, but it's really that.

And then it was an interesting process because, you know, I didn't just sit down. I tried 100 times to sit down, just write a book. And I found a process that was essentially a series of interviews and record them and then editing the manuscript and stuff like that.

And when it came to writing the final copy of the book, they're like, all right, we'll get you a scientific writer and all this. And I'm like, no, no, no, I don't want to write a textbook.

I want to write a book for the soccer moms out there. The the, the, the family that has a 17 year old hockey player in Minnesota or the, you know, the soccer player, high school soccer player, in Ohio, whatever.

And so they literally got me a mom who had no scientific understanding and had a teenage, soccer and and lacrosse player. Yeah. And so I had to explain all these concepts to her.

And that became the genesis for the book.

Writing When Brains Collide

It was actually, like I said, very cathartic to get that out of my head. Well, I'm sure you must be really proud of the book. So let's kind of dive into the book.

Little sneak peek for people who really want to read it right. So what is the general synopsis of the book? And can we prevent the effects of concussive injuries in the younger population and in general?

Well, so the premise of When Brains Collide is how I came to. It's a little bit of autobiography, but really how I came to the concept of using omega threes for traumatic brain injury.

And so, you know, part of the discussion, of course, is, you can't talk about omega threes without talking about omega sixes and the short. They're both essential fatty acids and omega sixes.

The downstream effect is inflammation. Pro-inflammatory mediators and omega three are meant to balance that and resolve the inflammation. And so so much so that balance that they share the same enzymes for making them and degrading and aggravating them.

And and just they really share the enzymes. The problem is our food supply has become so out of favor or out of whack with, with the Omega sixes. So one of the first studies that I did was looking at suicide in the military and active duty military, and we looked at 1600 samples, and we found that the ratio of omega sixes to omega threes was 25 to 1.

So it's no longer a fair fight given our food supply and how we eat and all the fast food and stuff like that. And we just don't eat enough seafood. So there's two parts to the equation.

How do you lower the Omega sixes? But omega sixes are fat so they stay in your body, you know, for months. You

know, the half life is literally, you know, somewhere around like 6 to 9 months.

And so really it would take years to the lower your omega six is if you even cut is, you know, because it's throughout ubiquitous throughout the food supply.

So I looked at the other side of the equation, not that we shouldn't be lowering or make it sixes, but how do you plus up those omega threes and how quickly can we do it.

And so that's really what I describe in the book, both from your kids in a coma effort or car accident to the soccer moms worried about their kid getting a concussion on the ice rink or the, you know, soccer field or the football field and you know, and then part of it, I go into, is there a role for prevention?

And I absolutely believe that because when you're at 25 to 1 out of balance with those pro-inflammatory omega sixes, your brain is just you had an injury on top of that, it's it's putting them, you know, lighting a match at a gas station.

You know, it's, you know, your brain's just going to become inflamed. And, and we've got to figure out how to put out the fire. What about some prevention?

Let's don't have a let's don't smoke at a gas station or light a match at the gas station. Right. You know, so how do we get omega threes up to a good level where it may be protective.

And if it doesn't protect you, at least you've got the right balance of omega threes to deal with the injury. If one were to occur. Right. And I always saw concussive injuries and the result of concussive injuries and CTE like the immune system. Right.

So, you know, there's, studies done on immune modulation of omega three. So really makes sense. You know, brain has its own immune system as well. So, let's talk about the doses.

Are the doses pretty much similar across the board, or is it more person dependent or sports dependent? That's a great question. I, you know, so part of the question.

So I developed what I called the Omega protocol, you know, brilliantly named right. Yep. And it's and it's really the idea that I, I stopped even doing blood tests on people because I know everybody's deficient.

Yeah, I think they're coming to see me. And so I, you know, how do I do a one size fits all type of approach that's going to be the 80% solution. And so I developed the, you know, the Omega protocol.

And the first phase of the Omega protocol was what I would call a loading dose. So I'm not starting small and building up, you know, you had a concussion yesterday or Friday night playing football.

Omega-3s, Inflammation, and Brain Health

I want to hit you with a loading dose to get that into, you know, to start charging that ratio. Okay. Saturate the brain with what it took to make the brain in the first place.

Right. Your brain is made of fat. You know, omega six fats. You know, arachidonic acid in particular omega three fats, DHEA in particular, and cholesterol.

I mean, those are sort of the three big fats that are found in the brain. So you can't make a brain without it. So it's what I call my brick wall analogy.

If you have a brick wall it gets damaged. Don't you want bricks to repair the wall? Well DHEA, the omega threes, the long chain omega threes are the bricks of the brain.

So let's blood let's saturate the brain with what it took to make it in the first place. And so that's why the larger doses as a loading dose. And then my goal is, you know, that's not good necessarily long term.

So then I work with patients to get down to kind of, you know, what I would call a maintenance dose or really even the dose that it says on the bottom of what's the suggested use?

So of a parent like myself, I'm a parent. If a parent is listening to this right now and they have their children, whether it's girls soccer, softball, whatever it is, right, that has a higher, higher prevalence of concussive injuries, can this be used, to prevent children from having a lot of the bad sequelae of concussive injuries as well?

And then the the Cordillera that is. How young should you start. Right, right. Yeah. And so, you know, interestingly enough, so the where, let's go back to infants, you know, where do they get the long chain omega threes?

Well, you know, first of all, a mother preferentially gives up her own store of DHEA, the long chain omega three, from her body tissues. And the most concentrated body chooses are the retina and the brain.

And so, literally, she's pregnant during pregnancy, right? Her a pregnancy. Right? So to help the infant develop the brain. Right is through breastfeeding.

And so, breastfeeding, the mother continues to give up. So a pregnant mother needs to be. Well, yeah. You know, that concept of eating for two and the concept that the the calcium is being leached from the mother's bones?

Well, DHEA is being leached from the brain. So a mother, a pregnant mother and a breastfeeding mother really needs to up the game on her omega three intake, right?

It's so important that 100% of all infant formula on the market in the United States now has DHEA added to it. It's so important when we hit that cliff, right.

You're no longer breastfeeding or bottle feeding. And then mac and cheese doesn't exactly have a lot of, omega threes in it. And so that's how young I think we should start is when in utero and in utero.

Yeah. It's actually and is probably the best. But but when you fall off that cliff, you start bottle or breastfeeding the. That's what you know. Now you're talking about kids that are, you know, two, three, four years old and then brains are still growing.

So it's literally that important. Now let's jump a little bit ahead to collision sports. Yet the middle school or high school level. I'll just give you a personal example and I think it'll demonstrate the point here.

I am a guy that's now been focused on concussions for, for, you know, almost two decades. And yet I allowed my son to play football in high school. And, you know, he was the all county running back, in high school football.

But yet I never let him leave the breakfast table without taking fish oil before he went to school every single day. And he's gone on to, in college now playing rugby, you know, so.

But I one of the questions I'm always asking is, are you taking your fish oil and, and he notices when he's not taking it just from a, a day to day point of view.

So, yeah, it's not just that prevention, but it's also good helps kind of. Want a little bit of that ADHD that that boys typically have at least a little bit.

It's good for your mental health. It's good. You know, it's good for so many reasons that I think a daily dose is really important for just about everybody.

Yeah, because so, you know, let's let's kind of break down. You were saying, you know, high dose, like, what do you consider high like what is that. Is there a cutoff for like regular dosing items.

Omega three. Well right. And and so when I first started out I kept being asked okay my brother, my cousin, my whatever had a concussion. How much fish oil should they take.

Yeah I really there was nothing to go on because there's nothing out there in the literature. At least there wasn't. And so, it wasn't until my younger brother, called me up and said, hey, I did something stupid.

I got knocked out, you know, with a concussion, unconscious. And, how about, you know, what should I do? And I said, I will take fish oil. And he goes, well, I'm already taking it because you told me to.

And like, well, then take more and easily. Or how much more, you know, younger brother. So I, I was like back against the wall and I pulled it out of the air and I said, all right, take, you know, take this much and wanted it, take it three times a day, you know, breakfast, lunch, dinner or whatever.

And he called me the next day and said, wow. He goes, I feel so much better. I've been meaning to tell you that, you know, I, I stopped taking my SSRI, you know, for depression.

And I kind of feel myself in that spiral. And he goes, I do it immediately pulled me out of that spiral. And I'm like, I guess, I guess I hit the right dose.

And that's what I've used ever since. And, when Jillian Bell's went into the laboratory and did some animal model testing, it turned out that the the dose that he used now it's in rats, but it was 40mg/kg and that was the dose he was using.

And it turns out that the dose I'm talking about of 3g or 3000mg of the omega three is 40mg/kg. I, you know, for an average sized person. So it's funny how it just sort of works out that way.

But then, like I said, I, I know that people are deficient. I want to make a difference right away. So I don't just do that dose, I do that dose three times a day for at least a week, if not 2 or 3 weeks.

So that we can make a difference. And what do people generally, experiences? I get things like, wow, I didn't know I was supposed to think this clear, have this good of a mood and have this much energy throughout the day.

And so, you know, great side effects to have while your brain is rebuilding itself and sort of rewiring it. You know, that neuroplasticity that we talk about.

Well, it's interesting. So 3000mg is a special number across the board. 3000mg. Omega threes. Is that magic number of significant proof of mental health 2000mg is the magic number improvement in autoimmune disease like lupus.

Right. And so we're seeing that 3000mg as a general number now of a lot of different other, you know, disease. So I'm not this hasn't really been part of that is just once you really start to dig into the biochemistry of it, it makes sense.

Right.

Dosing, Safety, and Supplement Quality

And so, people say, well, what about, you know, if somebody had a stroke or if they had a heart attack and they didn't have oxygen for a while for, you know, for a couple minutes or whatever the case may be.

That's the primary injury and chronic stress I would throw into that and chemotherapy would throw into that. Right. Is that primary injury? But after the primary injury, which is really just the mechanism of injury to the brain, whether it's a chemical insult or a physical insult or a lack of oxygen insult to the brain, then you go into the secondary injury or the secondary phases and those biochemical cascades.

And principally we look at inflammation, they all go down the same pathway. And so, when you change that pathway into a more positive approach with the omega threes, then you're going to see the differences, whether it's, an autoimmune diseases or TBI or chemotherapy or chemo brain, as we call it.

Absolutely. Now, is there such a thing as overdoing it or taking too much bad effects from that? Well, the biggest there's two things to take into consideration.

One is I never have people. I try to get them down to a 2 or 3000mg a day I don't keep. So I when I said 3000mg three times a day, that's clearly 9g or 9000mg a day.

And okay, so in today's manufacturing world, the best products, most concentrate products will have 1000mg in each capsule. So it's only three capsules three times a day.

Pretty easy to remember. But what might be the issues? The biggest one that will always come up and why? Doctors will say, oh no, you can't do that. It's going to cause bleeding and all this.

Well, there's I've challenged a number of world leading experts. Show me anywhere in the literature where that's been an area in bleeding is an issue with omega threes, and nobody's been able to show me in a clinical trial.

Nobody can do it because it doesn't exist. In fact, I know of several surgery programs around the country where they require their patients to be on omega threes a week before going into surgery because the outcomes are so much better.

Oh, interesting. Okay. Exactly the opposite to where they want to stop omega three. So we for the surgery as well right. No. Absolutely. Which is the wrong thing to do now nine grams a day I would you know especially let's pick on the athlete right.

And go through the return to play protocols and stuff like that. I don't want an athlete out on a field taking nine grams a day, because there is that potential.

And I would say, you know, one of the ways that omega threes is good for you is it counters the Omega sixes. So it makes us omega sixes aren't just pro-inflammatory, but they also are pro coagulation.

So they're they help provide the factors that help the platelets clot. Well you need you need inflammation. Inflammation is why you need to be able to clot your blood.

If you get an injury right, you got to stop the bleeding. But that's what omega threes are meant to do, is to balance the inflammation and help resolve it and balance the blood from clotting too much.

Right. You don't want blood clot too much and you don't want it to clot. Not enough. And so when you talk about Plavix and other, intake wagons, right.

You know, an older person, you touch their skin and they get a bruise. Official never does anything like that. Even at the higher doses. It's more like if you're taking an aspirin a day, you're you may get easier bruising at the higher doses official.

But that's really about it. And so that's why I would never want a, an athlete going back into a game at that nine gram level. I want to get them back down to the 2 to 3 gram level.

That seems to be protective. Okay. Well, I guess, and what I was taught in med school and residency is especially, you know, pre procedural. Let's make sure that patients are not on, on omega threes.

Prior but and I train in New York and in our guidelines, we didn't really care about fish oil. What we cared about is, omega three esters, you know? So, is there a difference between fish oil and then sort of the pharmaceutical omega three esters that are out there and really basic chemistry.

There's four versions of omega threes. So omega three is a generally a major comes in a triglyceride. So you have three branches unlike the less run back, glycerol backbone.

So you got the free fatty acids but they're not stable. So you're not going to find them, anywhere because they're not stable. You've got the what nature gives us is a triglyceride form and also a phospholipid form.

But phospholipids are really much smaller percentage. And so asters don't exist in nature. And so but that's part of the process. So what is an oyster.

They take that triglyceride, they break the the glycerin backbone. So they have the free fatty acids which are not stable. So they have to stabilize them with some.

So they mix it. They combine it with an alcohol molecule ethanol. So that's it's a fish oil free fatty acid combine to a and an ethanol molecule. And that's how they're able to manufacturing wise how they're able to both concentrate it but also to clean it you know, so they get the make sure there's no heavy metals and toxins and stuff like that.

And what you and you can concentrate it and what the easiest thing manufacturing is. You just stick it in a, in a capsule and sell it. And literally that's what the pharmaceutical companies do.

And they charge, you know, 25, $30 per capsule. It's crazy because the manufacturing is like ridiculously simple as far as that. What's much more complicated and what some of the best nutritional companies do is take those plasters that have now been sort of cleaned and then concentrate, and then what they do is they're a by that meaning that they put it back into that triglyceride form.

So it's not the natural triglyceride it came in, but it's a re terrifying or reconstituted triglyceride form that's absorbed just as easily as a, as the nature's triglyceride form.

So crude oil was a little bit higher in phospholipids, but it's still mostly in the triglyceride form. But the answer is they don't exist in nature, so our body doesn't know how to absorb them.

And so the absorption rate is significantly lower compared to phospholipids and triglycerides, which are about the same actually. So you have to take 2 to 3 times as much of this as ester to even get the same amount of omega threes even into your system.

And then you have to deal with all the gastric upset, you know, things it's it's terrible on the stomach. Whereas a good quality triglyceride supplement shouldn't bother your stomach at all unless the product is spoiled.

Right. And for those who are listening, the triglyceride we talk about, it's not the same triglycerides that you have in your lab work. And so they're we're talking with two completely different things.

So omega three triglycerides are not the one that's measured in the doctor's office on the annual exam. So, we're not talking about that. And so I think that when if we think about omega threes, general, I think that the biggest misconception, in the general public is that, you know, each of its omega three, its an omega three.

But as you said, there's different forms in it as well. But what about brands because there's huge pricing differences like across the board. You know, and there's one particularly better than the other.

Like what do you think. Oh, absolutely. And you get what you pay for is really, it's an old adage, but in this case, it truly is. You get what you pay for.

So you go to a big box store, without naming them, but you know who they are, and you get a gallon of fish oil for $2. Yeah, yeah, you're probably not getting the best quality or your local pharmacy, the, you know, the CVS, Walgreens, Rite Aid's, that kind of thing probably.

You know, it's cheap. It's, you know, price wise, it's it's because they basically did the minimum to put it into a

bottle. It's most likely going to be in that, apostrophe form if it doesn't say, you know, that it's in the triglyceride form, you can assume that it's in the ester form that's poorly absorbed.

The other thing to look at is, you know, take a really typical fish oil capsule. Typically it's going to be 1000mg. And if you read the label it's going to have, 160mg of EPA and 120mg, or 140mg, I might be off on that.

But anyway, it's of DHEA, it's going to have 300mg of EPA and DHEA combined. My math was up on that a little bit. But anyway, you get the idea. It's generally a 3 to 2 ratio, 3 to 3 of EPA to to the DHEA.

Which brings up a whole different question that we might get into, you know, which one's more important, you know that. And that's debatable, but I've got my opinion and we can talk about that in a second.

But so you look at that label, it's 1000mg one gram of fat, you know, one gram thousand milligrams and 300 of those milligrams are the EPA. And. Yeah.

Well, I would call that a 30% concentration. What's the other 70% I don't know, it doesn't tell you on the label. I have no idea. So, I mean, 70% of a product you're taking, you have no idea what's in it, you know, versus you go through the manufacturing process that I just talked about and re, constituting the triglyceride form and concentrating it.

So, so the best products out there on the market are a little bit bigger capsule.

Food Sources and Where to Learn More

They're going to be 1250mg, 12 50mg. And the reason why with that, you know, that little bit of an increase of 25% increase. Yes, it's a little bit bigger capsule.

But they'll have 1000mg of the EPA and DHA, the combination of those two. So you get 1000mg. It's a 90% concentration 90%, not 30%. And you know, it makes you instead of you have to take three of those other ones to make up for one good quality one.

So are you really getting what you pay for? So if you break it down into the dollar per EPA, DHEA, molecule, you're probably better off spending more money in, you know, on the better product.

Plus you will have less like less likely to have side effects of those fish burps or the gastric, upset or reflux. Right. And then the storage issues too. Right.

Because sunlight hits, it oxidizes. Right. And and the, the shelving temperature that may not be as great as some of the big box, locations. Well, and rest of these and then I think the last thing is, you know, and then one of the biggest questions I get, I'm sure you too, is like.

Like what? There's so many brands of fish oil out there. You know, I saw some patients that if you go to, like the parent company site and you can find a certificate of authenticity for that bass, if the one you're taking, it's probably a good quality fish oil and it's third party tested usually for heavy metals like mercury, which is a huge issue in fish oil.

And all of a sudden that's a mercury. I would argue that, you know, so the the industry organization has called, you know, a, global organization for EPA and DHEA, you know, they, they a few years ago, they did a test of something like 350 or so different brands out in, and not a single one of them had, exceeded any EPA standards or whatever of Mercury, heavy metals or any kind of toxins.

So that's like I think that that's that's another myth that, you've got a much greater possibility of getting, mercury load, if you will, from eating good fish.

You know, the bigger fish is like, you know, even like tuna and swordfish and other ones, you know, it's still not

significant enough to offset the benefits you get from the omega threes.

But right it you're going to you have a bigger probability of getting a little bit of that, heavy metal issue from actually eating good quality and good quality fish.

Godspeed. Gotcha. That's that's great to know. Not and I don't want to discourage anybody from eating good quality fish. I know the benefits far outweigh the infinitesimally small risk of too much mercury.

And so, you know, so what's a good fish? You know, I generally advise people to stay away from farmed products, whether it's farmed shrimp or farmed salmon or, you know, the worst of the worst is tilapia.

Basically has no omega three in it at all and probably has more, you know, heavy metals and, and, and plastics and stuff like that in it. So, you know.

Yeah, you see, the world's number one source of ingestion of legal flocks of some is that, you know, which is linked to biotech. It's kind of crazy. Yeah.

So, so go with fresh caught, you know, you know, fresh cut. You know, shrimp fresh caught. You know, Alaskan salmon. If it's a salmon it's probably farm raised if it's Alaskan or, you know, wild Pacific Northwest.

It's probably yeah, that's probably my favorite. But the other ones that are really good are the smaller ones that none of us really like, like anchovies and mackerel and and stuff like that.

But when they're cooked, right, they're unbelievably good. Yeah. Yeah. When they're cooked. Right. Yeah. Anchovies. Katsu. I'm very particular about that.

And sardines. Salmon is much easier to cook and not screw up. You know, so, you know, go go with Pacific North wild, Pacific northwest salmon. You can't go wrong.

So I think the the story here is keep it natural, keep it fresh and get good quality sources of food for, omega threes. Well, and that's also why we call it a supplement, right.

It's not it's not a replacement. It's a supplement. Right. Absolutely. Well, listen, it's been a fantastic talk. I wish we could go on and on. But we can't.

How do people find you? How do people find more information about what you do? And, you know, one of the things I talk about the army and stuff like that.

So I spent, you know, three decades in the Army. And when I retired, I started a small nonprofit called Brain Health Education and Research Institute.

It's a big name, but really what I do is I focus more on the education of putting, things out there. So you can find more information at Brain Health education.org brain health education.org.

I'll make, you know, pitch again for my book. Go on Amazon and get When Brains Collide by Michael Lewis. Unfortunately, I am not the Moneyball, blind side author.

Although, you know, I like to trade bank accounts with them. You know, so. And I keep hoping that people confuse us and buy more of my book. But, the.

But. Yeah. So when brains collide on Amazon and brain health education.org or the two best ways to to track me down now. Excellent. Well thank you for this fabulous discussion.

I appreciate you coming on and, find it absolutely valuable. Thank you very much. Oh my pleasure.