Impenetrable Fortress: How To Fortify Your Brain Against Memory Loss (& Reverse Alzheimer's)? Transcript

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Introduction and Guest Welcome

Welcome back to the Reverse Alzheimer's Summit. I'm your host, doctor Heather Sanderson, and I am absolutely thrilled to have doctor Dale Bredesen here today.

He's an internationally recognized expert in the mechanisms of neurodegenerative diseases. And doctor Dale reticence career has been guided by the simple idea that Alzheimer's, as we know it, is not just preventable, but also reversible.

Thanks to his dedicated pursuit of finding this science that can make this a reality, this idea has has placed Doctor Peterson at the vanguard of neurological research and led to the discoveries that today underlie the Recode report.

Doctor Pedersen is the author of the New York Times bestseller The End of Alzheimer's, as well as the End of Alzheimer's program. Doctor Bateson is also a mentor of mine and has influenced my work profoundly, and also the health of so many of my patients, and so grateful to him for his guidance and for taking the time out of his very busy schedule to be here with us today.

Thank you so much. Thanks so much for having me. Heather, always great to talk to you, and thanks for the fantastic work you're doing with your patients.

So one of the reasons I'm so excited to be recording this now at this time, is because you and your group have just published a trial, taking 25 patient participants through your basically your whole program.

So I'm thrilled that we can finally share with the world what you guys are finding. There's a study that we can point to, to not just the one patient here or there that is getting better in someone's clinic, but that there's robust science coming out.

So would you please just describe the the trial, how it was set up, the protocol and then also what you found. Yeah. Great point. So, you know, way back in 2011, we proposed the very first trial that would address all the different pieces, the things that we have identified in the laboratory, over the years that were critical things like specific pathogens and things like specific toxins and all the things that you deal with with your patients as well.

And we were not allowed to do the trial back in 2011 because it was, quote, multivariable in the IRBs wanted this to be single variable. So you just had, you know, drug or placebo.

And so of course, we objected and said, hey, wait a minute. This is not a one variable disease. So we wanted then to collect anecdotes. And as you know, we published anecdotes 2014, 2016, 2018.

We published 100 with improvement that was documented. So then we went back in 2018 after that publication and said, okay, can we do the trial now? And they said, no.

And so, you know, it's still crazy.

Designing the 25-Patient Proof-of-Concept Trial

So finally, in 2019, we were allowed to do a proof of concept trial. It's only 25 patients. But the idea was it would allow us then if we got good results with that, to go to a randomized controlled trial, which was what we're now in the midst of doing.

So really very fortunate, to link up with Diana merriam and the Four Winds Foundation that supported this trial. And we're just fantastic. And then also also, three absolutely outstanding functional medicine physicians, doctor Anne Hathaway, doctor cat tubes, and Doctor Deborah Gordon.

So really honored to work with them. And as you know, we basically took this from the test tube straight to the people, and to say, okay, what are the things for each person instead of all previous trials, which, as you know, have predetermined what's going to be the treatment, which makes no sense.

Or they say ahead of time, everyone who comes in is going to be treated with drug X, no matter what's causing the problem, which makes very little sense.

So the idea for this trial was to flip the script and say, okay, for each of these people, we're going to look at all the different determinants. And there are about 150 different determinants from their various genetic things.

And we worked with Intelex DNA and Doctor Sharon Houseman, whom, you know, to look at with, the genetics, whether, you know, whether there were issues, with that glue to fly on, related with methylation related with thrombosis for later on and on, and then also looking at the various biochemical parameters, the various micro biological parameters, looking at gut status, of course, looking at all the different pieces and for those for then for each person, we were able to construct a fairly, hopefully a fairly accurate map of what were the contributors.

And as you know, you virtually never see people with just one contributor. Typically there are multiple things, starting, of course, with the genetics, with a belief for very commonly.

And about half the people in this study turned out to be able in for positive. But we saw all sorts of different things, as you can imagine, across the spectrum, and then tried to guide that and target treatment to each of those things.

And of course, it included a core. So we had a, mildly ketogenic plant rich diet for people. We wanted to look at their sleep. We wanted to look at their nocturnal oximetry.

We wanted to look at their stress levels. We wanted to look at their hormonal levels. So all of the things that you know well from functional medicine world that are critical, I think what the science has taught us is what the what the priorities are.

There are things that have a fairly small input into cognitive decline. And then there are things that have a huge input into cognitive decline. And so then we can look at each of these and target these.

And as you can imagine, the people who were able to comply. And when we have people working with health coaches. So it was really fantastic people working with nutritionists and people working with physical trainers and then working with, neurofeedback and things like that did very, very well.

And so we were very excited to see, how much better the outcome was with these people than with a typical drug approach to Alzheimer's disease. So how long did it take?

How long were people in the trial? When were you getting the metrics? Yeah. Great point. So what the the each person was on for nine months. And so the idea was we typically see people improving within 3 to 6 months.

So we did we looked at several variables. So we looked at their Moca scores. We looked at their CNS vital signs scores so we can get a more sensitive indicator.

And also different domains. We looked at their IQ change scores. So in other words did their partner notices. You know some of the drugs just barely reach statistical significance.

But the partners couldn't tell any difference at all. So we wanted to know did the partner also notice that these people were better, yes or no? And then we also looked at their MRI volumetric.

So we looked at what happened to their gray matter and what happened to their hippocampal volumes. And then we also looked at their brain HQ. So did they get better with their brain training or were they failing on their brain training.

So that way we it gave us a lot of different complementary parameters that we could look at for these people. And what do you find. So yeah. So we looked it was interesting.

We looked at three months, six months, nine months and then nine months was the end, as I mentioned. And what was interesting to see was at three months they had improved somewhat, but it was just reaching statistical significance.

At six months, they had clearly reached statistical significance, and at nine months they were still better. And at that time it was less than p p less than 0.01, so really strikingly improved.

And we had people who went from smokers of 19 to 30, perfect scores of 30. So we had some dramatic improvements and then we had some less dramatic improvements.

And again, we had and we had just a few people. So 84% of the people improved their scores, improved their CNNs vital sign scores, 76% of the people improved their Moca scores.

And what was interesting is that their MRI is actually improved. So you can look at MRI and there's a there's a great example of, you know, what actually happens with MRI over time.

If you have Alzheimer's or MCI, you typically lose a significant amount of gray matter volume and hippocampal volume each year. And you can see that going down if you're aging normally with no, no complaints, you actually still lose a little bit on average.

So these people who actually had MCI or Alzheimer's, and we had some with each actually did better in terms of their MRI volume metrics than normal people who had no complaints.

So their gray matter volume actually increased slightly. Their hippocampal volume was a slight decrease, but as I say, less decreased than just normal aging.

So they show for all these parameters they did well. And by the way, their HQ change scores, their partners noticed that they did well as well.

Personalized Treatment Protocol and Core Interventions

So by all these different criteria, and actually 100% of them improved their brain HQ scores. So just practicing getting on this, they actually they all did better with that.

So I think again, it really supports the idea that targeting the things that are driving the decline, really is the way to go. Now, of course, we didn't include people with Moca scores of zero or 5 or 10, and that's one of the reasons I'm very excited about your trial, where you're looking at people with Moca scores down to 12 hours was 19 through 30, and with CNS vital signs that were abnormal as well.

And so I think it's going to be very interesting and very important, what you see in your trial. So one of the questions that I get asked most frequently in my office is if we do this, if we put the money and the effort and all of this energy, if I, you know, go to part time work so I can help my mom or dad do this, how likely is it that we're going to get benefit?

And that really was what drove me to ask the question of, you know, who, who's going to get benefit and how often, so that I can have a lot of confidence telling these families.

I think one of the big things I want to come back to that you mentioned was the changes that the spouses of

Alzheimer's is so devastating not only to that individual, but to the entire family network that's affected.

And sometimes it's not even just the family, right? They're out of the workforce, and a caregiver can come out of the workforce often. To take care of that person doesn't just take down the patient.

It affects many people around them. And, you know, measuring we failed to do that. In the next trials, I think everyone should be doing that because how we define success is really important here.

And, that's what I want to draw attention to for our listeners, is that the changes that a caregiver notices can have that has more, you know, you start to get exponential impact.

Right? And when we compare this to what some of the drug makers are looking for in terms of success, I want to be really clear about the differences there.

What you're talking about is improvement. What they're talking about is a slowing of decline. So I know you have a slide that really represents this. Well, yeah.

Let me just show this. That's a great point. Let me just show the difference here. So I think you're right. The the semantics of success are very important.

So this is just to illustrate that on average if you have someone who has Alzheimer's or MCI and this has been this is in published literature, then you lose on average about 3.4 points on a 30 point scale per year.

So you lose, whether you're talking about MSK or Boca, you're losing a little bit each year. The best. And so aducanumab, which was just approved in June by the FDA, so-called adieu, held this in its best trial.

And I should say in one trial, it failed completely. But in another trial, at one dose, only the best it did was to slow the decline by 22%. So it's not making people have a better cognition, it's just slowing the decline.

And unfortunately, you know, one of the years ago, one of the husbands to one of the patients said, you know, I know that drug makers are trying to make drugs that slow the decline.

So but speaking as someone who's the spouse of someone with relatively late stage Alzheimer's, this is the last thing that I would want to see. So it's really tough.

And you know, we all want to get things earlier on, get people. And that's one of the big goals to get people to come in early. And I should say the aducanumab trial, the range of cognitive scores that they took were very similar to what we did in our trial.

So ours were 19 and above, for the for the motor scores. And so you can see here in the trial, in the, in our trial, on average there was a 3.89. improvement.

So they actually had improved cognition. Now as I said we had people going from 19 to 30. But but on average it was 3.9. And a lot of them there was a bit of a ceiling effect because people would start at 26, but you can't go up too much from 26.

You can only go to 30. But this is what we saw on average. So I think you're absolutely right. It's important to talk about the semantics of success. So many people have asked me, well, I should I put my spouse on this drug because do you think it will help?

Do you think it will make them better? Well, that's not what the drug is for. It's simply to in the best case scenario, slow the decline. And of course, that's with, 17% of them developing micro bleeds in the brain, about 40% developing, some form of edema, swelling in the brain, headaches, you know, all sorts of issues.

And with the ability for positives, it was about 50% who had complications. So, I think as many neurologists have

said, this is not the drug we were looking for.

You know, this is a drug, but it's it's not the goal. So that's another point, that I really want to drive home. Here is the difference in side effect profiles.

Right. So this we're talking about a drug that can cause micro hemorrhages. So bleeding in the brain swelling in the brain high cost burden to Medicare.

Whoever's paying for it to make sure that these side effects are managed. On the flip side, what are some of the side effects of your intervention? That's a great point.

So the intervention that we use, the side effects have been, better way control, improved lipid profile, improved glycemic, profile, improved insulin sensitivity, improved microbiomes, improved depression, more joy, you know, happiness.

Now, to be fair, yes. It's, you know, it's a complex approach. You're you're hitting various things. And so, you do, you know, it definitely helps to have a health coach, but what people found is that they have more energy.

They do better, they feel better, they sleep better. They, you know, their their whole lives are improved. And again, I think this comes back to this fundamental schism in medicine when I was trained in medicine and and I'm sure when you were as well, there was a lot about writing a prescription and a lot about kind of non physiologically relevant.

Although I know you were trained that a more physiologically relevant environment, which is fantastic.

Trial Results and Cognitive Improvements

You know, human beings are complex organisms. And I think we're now understanding that there is so much more that we can do to address the physiological parameters that are driving the decline to begin with.

We are unfortunately still laboring under that. This whole the Flexner Report of over 100 years ago that changed American medicine and said medicine should be more scientifically based.

Great. The science has moved on by more than a century, and the medicine really hasn't. So it's now time to increase our data set size, to have more complex algorithms, to have deeper dives into what's actually causing these problems.

So I think that, you know, that is the future. And I think that the part of that future is going to be a future where we really pretty much end these complex chronic illnesses, from Alzheimer's to Parkinson's to Lewy body disease to, you know, on and on.

Yeah. This is such a really great point, is that the the science and the paradigm that we're using, they don't match anymore. Right. And we have the ability we have the the intellect.

Do we have you know, we have the people. We have the, the technology to really start to match the complexity of the human body with our intervention. And there's there's nothing stopping us other than sort of these social constructs.

Right. You know, it's interesting to me that, you know, Google knows where you shop. They know, you know, how you're living your life. They know a lot of things about you, and they have some very, you know, some very complex algorithms to use.

So why are we not using that same sort of technology to identify people in their earliest changes? And there's been discussion about using changes in keystrokes, for example, or using changes in pick up.

When Alexa is listening to you, Alexa can tell you, hey, you know, your voice is beginning to change in a way that suggests that you may be getting you maybe at the earliest stages of cognitive change.

So I think for the future, having the earliest ability to get people to make sure that you now are ready to reverse your cognitive decline is absolutely feasible and will be the way of the future if we simply get people to come in earlier, either for prevention or earliest reversal, we really can make neurodegenerative diseases rare, beginning with Alzheimer's, but then including these others.

And let me just make one other quick point here. One of the biggest things that has held all of us back, and I think is actually hurt millions of patients, is the term mild cognitive impairment.

So if you look at what happens to all of us, to people who are developing Alzheimer's, there are these four stages. So you have you have a pre-symptomatic stage where you can already pick up changes on Pet scans and spinal fluid and things like that.

And so and so, you know, we call this pre-symptomatic. Then we have a second subjective cognitive impairment, which typically lasts about ten years. It's easy during that time to reverse the decline, but very rarely do people do anything about it.

Then the third stage out of four we call mild cognitive impairment. At that point, you're relatively late in the pathophysiological process. So this is very much like saying, oh don't worry, you just have mildly metastatic cancer.

It's really a late stage. And so to me MCI should be called advanced stage Alzheimer's. It's the third of four stages. And by the time you're actually told you have Alzheimer's, that is final stage Alzheimer's.

You're actually now losing activities of daily living. Typically, you've now had the underlying process for two decades. So we're hurting the patients who are hurting our practices.

And we hurt we're hurting the global burden of neurodegeneration by saying, oh, don't worry, it's just MCI. We really want to get people in far before that, hopefully for prevention or at the latest for CI, CI, which really should be called early Alzheimer's disease.

That's when the changes are actually there and they're already symptomatic. And the reason this is so important is because this drives human behavior, right?

There are so many people who are still told the old, outdated, factually inaccurate narrative that there is nothing you can do by their neurologist who's very well-meaning, but who doesn't realize that there are interventions that can work.

And so people are driven to either hide it or go further into denial, and they they delay getting the care that could help. So changing the storyline so that people here go soon, they go immediately.

When you start to notice change, that's when we can have the biggest impact. That's when we can really prevent this disease from, from essentially torturing you and your family.

So. Right. So the number of people, that we're in the book that's coming up, the first survivors of Alzheimer's, they are worried about their families.

So now the idea is you're going to end it with this generation. And none of the future generations should have this problem. Alzheimer's is optional. There are things that we can do, especially if they're done early on that can prevent the progression of the nurture generation.

So there's, a lot we know, a lot more certainly than even a handful of years ago. What are some of the intriguing things to you that we don't know? What are some of the important questions that are left unanswered?

Great point. I think there, you know, there are a couple of directions that are that things are happening. So we looked at initially in the laboratory at what is the what is the fundamental nature of this problem.

And what came out of this was surprising and interesting to me in that it really is. If you look at the fundamental nature of this problem, it is a it is a network insufficiency.

So just as you would have a deficiency of vitamin C giving you scurvy, this simply is a more complex insufficiency. It's an insufficiency of a network so that now the network demand exceeds the network supply for years.

And then ultimately you start, you know, bringing the network down very much, by the way, when it's very much analogous to what happened with Covid 19, we had an insult, SARS-CoV-2.

Everyone was told, shelter in place, pull back, go into a protective mode, a downsizing protective mode. And of course, we end up with a recession. Your brain is doing the same thing.

Why Improvement Matters More Than Slowing Decline

It's exposed to pathogens, things like gingival loss and things like, you know, various fungi, herpes simplex, Lyme disease, you know, toxins, all of these sorts of things.

And your brain is saying, okay, I'm going to go into a protective downsizing mode. So we then simply have to address these things. So we look at that.

And then there kind of two critical directions. One is can we now adapt this and look at the specific neurochemistry for other diseases. So we're now started what we call the Arc project arc because the arc was two by two by two.

This is small numbers of patients and we're dealing with the first ones, who have macular degeneration. So we're very excited. It's a different chemistry, but there are some of the same sorts of things.

And then the next one is going to be, Parkinson's Lewy body and on on and on. So we're very interested to go in that direction and see if we can adapt this approach to all other neurodegenerative diseases at the same time.

As you kind of apply, we're also looking at how do we now make this better. What about people who come in with single digit Moca scores, who truly have very late stage Alzheimer's?

And so we're I'm very interested in setting up another trial that we would call the Sarah trial severe Alzheimer's reversal attempt. So this is an attempt.

What do we need to add? So for example, what if you take these people now and who we they're no question. Anecdotally there are a few people who will improve their Moca scores.

We've seen people go from 0 to 6, seven, nine. We've never seen anyone go from 0 to 30. What are we missing? What you know is there. Do you need a brain transplant?

Do you need stem cells? Do you need intranasal trophic factors? Do you need you know, what is it that you need to to make people do even better? Of course, we hope that ultimately that won't be an issue because nobody will wait that long.

But but we so we'd like to understand so all sorts of interesting new areas as you know plasma religions, all really interesting work by the biochemist Doctor Dan. Good.

Now on plasma allergens which are typically low in people. How do we, you know, how do we improve those? And is that going to turn out to be critical?

I think, the jury's still out. We don't yet know, but they certainly look very promising. What about stem cells? And are

there specific ones that are going to be better than others, and are you going to have to administer them in a better, you know, a different way?

Do you want to open the blood brain barrier, which is a common thing that's done when stem cells are administered? Is that going to be more helpful? I think there's a lot of promise for some of the intranasal trophic factors.

So things like the vernal tide, which failed unfortunately, in the past. But of course it was it was used as a monotherapy. So all of these things where they try to use it as a monotherapy, I do think the future is going to be to combine targeted drugs along with the the protocols where we can target the things so that you're now going after what's causing the problem.

But you also have very powerful drugs against specific molecular targets. I do think it'll be interesting to see when you take things that are anti amyloid, which I think are not a great idea at the beginning.

Yeah, it's there for a reason. But now after you've addressed those things, is it going to be okay secondarily to begin to remove the amyloid. And I think, you know, that is going to be an important question.

The concern is are we going to cause cerebral hemorrhage? So, we're still arguing about whether we should be trying to include this as a control in this next trial.

My concern is it might be a bit dangerous. I mean, we don't want to cause cerebral hemorrhage in people. We don't want to cause a diem and things like that.

However, maybe we'll very low doses, over time to to help slowly remove that amyloid which you now no longer theoretically need because you don't have the same insults.

Of course, there's a lot now on microdosing of various things like LSD and various things, the ayahuasca and, psilocybin and all these sorts of things.

So there's some promise there with, with small doses of these as well. You have to be a little bit careful. There's some interesting work on cannabinoid receptors, and fairly direct roles in the process of amyloid and cognitive decline.

So I think that the what's really interesting to me is we've been taught that the arsenal is zero. There's nothing you can do to prevent or reverse or delay the decline of Alzheimer's, and therefore don't check your weight.

But we status, you know, don't look. And I think the truth is just the opposite of that. The arsenal is huge and the critical piece is knowing when to use it, how to use it, what to target, and knowing you know, what the critical species are.

Now, one thing we are finding, and I'm sure you're seeing the same thing, people will improve and then plateau. And there's something being missed. And sometimes we'll say, okay, this turns out, and one example for, for example, is a person who did very well, then started to have a little problem actually, and turned out to have undiagnosed the desire.

And when that was addressed, she then did very well. Once again, I mean other people, it turns out to be things like leaky gut or it turns out to be things like, you know, undiagnosed or unrecognized toxins that were present.

One recent one turned out to be just a person who was now under additional stress and just removing that stress. And I was, you know, as a scientist, I used to think that stress wasn't particularly important.

And I have to say, you know, I have to say it's turning out to be very important. And of course, I can't argue with the data. So things like meditation, which we never considered in the laboratory, turn out for some people to be absolutely crucial to getting the best outcomes.

So I think we're all once we kind of have the background, we have the template. We're now all seeing how we can make this better, better, better, better.

And so I'm really interested to see, you know, what you see. Now, I should say we just looked at the data so we know we we published the data on the the the preprint server MIT archive.

We've now looked at what happens when you just don't do the trial, but you just take large sums of data for many, many practitioners. So we've had, as you know, over 2000 practitioners who's now who've now, been trained.

Side Effects, Safety, and the Limits of Drug Approaches

They're not no one's following them so that therefore it's that you don't have the same level of compliance with the program. And no surprise, the data show that on average, people did a little better, but it clearly wasn't as good as the trial.

So getting people to do the right thing and optimizing things really turns out to be important. And this is much more like surgery than it is like medicine.

There are doctors who are getting almost everybody to get better, and there are doctors who are getting almost nobody to get better. So it really does depend on because, you know, you you become good at this over time, in working with people and in getting your best outcomes.

So one of the things that people can do right now that they could take away today is a cognate. Skippy is what you call it. So if someone is listening to this and they're saying, this makes a ton of sense, what can I go do tomorrow?

Can you describe what they would ask their doctor to do? Essentially, yeah, that's a good point. And so, you know, the idea was simply that we all know that when we, that when we turn, 50, we should we should get a colonoscopy, so that we know where we stand.

And, you know, we can, we can make sure that we lower our risk of dying from colorectal cancer. So our idea was, okay, don't forget the cognates. Could be you want to, you know, if you're 45 or older, and certainly if if there's, Alzheimer's in your family, you probably want to do this at 40.

So at some point, you know, you want to find out where do I stand? And it's really the four big groups of things that you want to know, you want to know.

Are there ongoing pathogens? Are there ongoing toxins are that what's the status on trophic support. So hormones and nutrients and things like that. And then what's the status on energetics.

Which means, you know, it's going to mean blood flow oxygenation, especially people who have sleep apnea. That's a huge issue. Mitochondrial function.

And then your ketones, are you getting combustible substrates there. And that's where you can even see on a Pet scan that people who have Alzheimer's and pre Alzheimer's, are not doing well at it with, utilization of glucose in their temporal lobes and parietal lobes.

So for a cognate with the we look at that set of things, we're looking at the various nutrients in the various forms and in the various inflammatory, you know, metabolic inflammatory parameters.

And looking at that microbiome and those sorts of things, which are critical to know. And again, it's so interesting to me that 100 years ago, you know, we were all dying of acute illnesses like, you know, TB and all.

And, pneumococcal pneumonia and diphtheria and things like this. And now we're all dying of these complex chronic illnesses. And the bad news is, you don't get the symptoms until relatively late in the disease, just as we see with Alzheimer's.

The good news is, if you know what to look for, of course you can see them coming 1020 years ahead of time. So if you simply know what to look for, then you can look at these.

And just as we all know our cholesterol, we all know our blood pressures. We should all know these other parameters. And what's, what's been really interesting.

I think wearables are going to be so helpful as everyone's now being able to follow themselves. So you can see where your glucose stands. You can even do it day to day.

You can even do CGM, continuous glucose monitoring, which is so surprising to so many people. They find out that they have these huge, you know, peaks and valleys, both of which are bad for your brain so that they're developing their insulin resistance, but then they're also crashing at night and waking up in the middle of the night, not realizing, oh, my glucose is 45.

That's why I'm waking up. Your heart rate variability, I can I'm following my own, and I can see, you know, when I'm under a lot of stress is going to get way low.

And then when you're just relaxing and you're doing some deep breathing and things like that, boom. You know, you're so much better. So that's a critical variable.

Just simple things following your blood pressure, looking at your nocturnal oximetry, making sure that you're getting enough oxygen while you're sleeping at night, looking at your sleep stages, looking at your ketone levels, these things, then looking even at your vascular elasticity.

These are all things that we can all do fairly easily and monitor ourselves. And at the same time we can see, you know, are we are we getting too far?

You can use things like a breathalyzer. So a couple of weeks ago, I decided, okay, I'm going to try to my wife, my daughter and I all said, we're going to try fasting, mimicking diet.

And it was very interesting. I mean, my ketones went off the charts, high, but actually it was too much too soon. And I actually had to back down a little bit because I started feeling horrible, like, too much.

So I had to kind of ease into it a little bit bit more.

Future Research: Advanced Disease, Other Neurodegenerative Conditions, and New Therapies

And so for all of us, we can now see these things, which really gives us a leg up to see, okay, I am in a situation where I am at high risk for Alzheimer's and of course knowing your.

But for status or equally status and other genetics as well can be very, very helpful for this as well. So we really have so much control over our own future as you just said earlier, Alzheimer's is now optional.

So the this can feel I know for a lot of patients or people listening, if you're new to this, this can feel a bit overwhelming. And if you would like a guide or a coach, whether it's a doctor or a health coach or someone to help you through this, the Apollo website is a phenomenal one.

So Doctor Bateson and his team has developed the Apollo website. And you can now access practitioners so you can find practitioners who have been trained by Doctor Bredesen and the team there, to do this work.

So don't don't let this be discouraging. This is a very, very hopeful time where there is a lot of access. Like you said, there's over 2000 doctors or providers who have been trained.

And so the help is out there. The work is the word is getting out. Also, your books are very, very informative so you

can get started on your own. I've seen lots of patients who they get better, they follow the book.

They get a lot better just by doing the diet and lifestyle things they can do on their own. And then 6 or 8 months later, they come to me and say, I think we're plateauing as a husband and wife team.

I want to get more out of this. And then we do all the lab work. So there's a lot of ways to to kind of interface with this and use this information at home.

Do you have anything else to add to that about how people can get those? It's really vital nutrient, resources. No, I think that you, you hit on all the critical things so you can go to Doctor bateson.com.

You can go on the Apollo Health co, website. And, you know, this will give you information. We also put it in the second book of the End of Alzheimer's program, a lot of specifics on where to go to get additional information.

And as you said, people will often get improvements just on their own doing some of the basics. And then we'll say, okay, now how do I have to keep tweaking to get better and better outcomes?

And that's one thing I think that's been very interesting to see. It's not like classical medicine where you write a prescription and say, come back in two months.

You're continually improving, improving, improving because you are dealing with a very complex system, your brain's synaptic connections. And there are multiple things that will impact this.

And so, in fact, you can continue to get better. And the most important thing of all, interestingly, something that you don't get just from the trials is the sustaining.

So if you look at, for example, a drug like Aricept, you get a little bump, but then you go right back to decline again. In fact, over the time course, over several years, what's actually been published is that people who are on Aricept, it's slightly worse than people who weren't on, unfortunately, because yes, they got the initial bump, but they went right back to declining.

Whereas when you do the right things that you're actually addressing the things that are causing the decline, when you get the improvement, you sustain the improvement.

And if you continue to optimize, you can actually even enhance the improvement. And we now have people who are on for over nine years who have continued their improvement for this nine years. Wow.

So kind of taking this back to a bigger, more kind of global scale. The population is aging, right? We have more and more of us are older. And, we are going to need some solutions.

Otherwise, literally in this country Medicare may go bankrupt. And there are many people who you know and not to not to be too negative here, but I see it.

I have patients who show up in my office and they did. They didn't have kids. They don't have close family, or they're the youngest of their siblings, and they're terrified of getting older and not having either the financial resources or the network, the social network that's necessary to age gracefully and age in a, in a, in a way that they would look forward to.

And so we really need to start reimagining as a society what aging looks like and how we, how we address these neurodegenerative disorders that are so common in, in the senior population.

So I'm curious, you know, if we were to take that step back and look at what are the global solutions look like, what are what's your vision? You know, this is such a good point.

And I was just talking to a professor yesterday, who was talking about the, the amount of money he was spending,

over $200,000 per year, for his poor wife, who's in late stage.

Also, it was just it was so sad to hear. And this has been a burden. It's been a burden in so many ways. Finances are one one way, but there's so many other things that torn families apart.

It's of course, ruined the finances of the families. The interactions with the, with the children and the spouses. And of course, it's just, you know, just the, the psychological, the psychological impacts are huge.

And, so this is a problem, as you indicated, in fact, as Professor Christine Jaffe published a few years ago, this is now the third leading cause of death in the United States.

It's actually number two in the United Kingdom. So this is a huge and growing problem. And so you're absolutely right. We really need now to fashion. What would it be like a global program would be like a global vaccine program.

But in this case it's a global program to prevent neurodegenerative disease. And in cases where it hasn't been prevented to make the earliest reversals possible.

And if you think about this, you want to have a way that's efficient, that's the key. You want to have a way that where you really, get everybody without you bankrupting Medicare.

And so the idea would be to have a layered program. So it's a little bit like a pyramid. You're starting out with a simple set of things, just as you talked about earlier, what people do, some basic diet and lifestyle things.

Everyone can can do some simple things and even get evaluated for a couple of simple points like their genetics and very inexpensive and do that. So the vast majority of these people should never suffer cognitive decline.

And then what you can do for essentially free is once a year you simply check to see where they're where they're going. Again, you can do it by CNS vital signs.

You can do it even by that. People are now looking at keystrokes and things like this. So there are other ways to go. So you look to see where people sit.

Now what'll happen is most of these will not go on to starting to have problems. A small subset will those people. Now you have to take the next step so they'll have a little more evaluation.

They'll have a little more, it'll be a more extensive program. The majority of those will turn around and do very well. A small number of those will go on.

Early Detection, Prevention, and Practical At-Home Testing

So we have, as you now, have a graduated hierarchical approach where smaller and smaller numbers of people. So you'll only ultimately have a very few people that will actually break through these different layers and actually have cognitive decline despite an evaluation.

And those people, ultimately they will have some time in the hospital. And you have to look very deeply at all the different parameters. Why did they break through, these relatively straightforward programs?

I think you've done an absolutely fantastic job by setting up marama, where you're taking now the, of course, the disadvantages, you're seeing people relatively later in the process.

Ultimately, we what we like to see is that the vast majority of people would never get that far along. But for those who do, you have a fantastic program.

And the really the first of its kind. I think it's a real role model for so many other places around the world that will be

looking instead of simply watching people decline, will be actively involved in improving them and sustaining some level of cognition so that they now aren't lost to the family.

So I really congratulate you for such an outstanding job for setting up marama. Thank you. One of you know, one of my big goals is to I would feel successful if we could shift that entire senior living industry a little bit in our direction. Kind of like what you're saying.

Like, if we just got the food right, what would be the change? Even just if we looked at the numbers right, the health care dollars that are spent in the people living in kind of a conventional setting where there's, you know, cake, cookies, ice cream, pasta, cereal, versus what we know is a very brain healthy diet.

So what would what would all of what would the financial impact just be at the health care level, right. Not to mention all of the other pieces, I think.

I mean, I think you and I can predict what that would look like. But just showing people how those relatively simple interventions with using information that we already have can really shift the trajectory of, of someone's health.

And the quality of life is another thing. I'm sure you guys measure that we're measuring quality of life scores in our study. And, you know, you expect improvement because people feel generally healthier.

So, yeah, it's such an exciting. Absolutely. So as you and. Yeah, absolutely. And I would just add, you know, in addition to all the things that we've been talking about, there was a nice paper recently, as you know, by Doctor Cara Fitzgerald, who was looking at aging parameters, looking at essentially methylated regions of the DNA that have been shown to be associated very closely with biological aging, and showing that doing some of these same sorts of things, not only is it making your cognition better, but it's actually giving you a reversal of your biological aging so that she saw about 3.26 younger years on people who were on a protocol.

Again, some of the same sorts of things compared to the ones who weren't on that. So as we're so we're going to be doing looking at biological aging with her on this next study.

So it'll be very interesting to see. Can we see cognitive improvement. But can we also see improvement in biological aging. So Ryan Bradley I mentioned to you earlier, he's my co-pi and my Co primary investigator on our trial.

And he reported her as her co-pi on her trial. So I'm very familiar because I know that they're my naturopathy colleagues, very familiar. And I know, the, the metric they used, the, gentleman at UCLA, the professor there before, but.

Yeah. Horvath, has created that kind of that in a way, to test it. So for people interested, you can actually get a test. Is it true? Diagnostics, I think, is the name of their, their company?

I think it is. Yeah, yeah. And so, so you can take a look at what they used and they have a lifestyle intervention. There's another one. I think they use DHEA and something else.

They didn't get quite as good data as Doctor Fitzgerald did, but there's a few people looking at this at how do we reverse the aging clock. So not just neurodegenerative things, but even taking that a step further and saying, how can everybody get benefit?

Don't you know we don't just have to focus on the brain, but how do we get yeah, how can we live better, not just longer lives but better lives?

Scaling the Model for Aging, Care, and Senior Living

One of the absolutely fun conversations I had recently was with a, another woman who is imagining and kind of place a place like Marama on the East Coast.

And we were talking about how fun it would be if by the time we retire, there's sort of this expectation that maybe you and your spouse or you and a friend go to sort of a retreat center for 6 to 12 months and you basically learn, okay, it's that it's that shift in your, your life, right, where you kind of graduate into retirement and how you want to live it.

Maybe you could go somewhere in the mountains or at the beach, whatever sounds nice and learn to live the healthiest lifestyle for aging and then take those patterns back to, you know, your home and your family and start to incorporate that.

So like a marama, but earlier on so that we can do that prevention and how fun. I would sign up for that. Yeah. No. And I think you're right. I mean, taking this to more like us, what would people would think of as a senior center, where you don't wait for it for cognitive changes or other changes?

And. Yeah, I mean, I think we've all been taught that it's it's all about a drug. You just get a drug for each problem. And instead of the fact that, in fact, the as we understand more and more, getting a healthy set up and understanding what's driving a lot of health is so much more powerful than we were taught in medical school.

And so, you're right, going to a place where you'd actually learn essentially learning to live healthily, which we kind of take for granted. Oh, yeah. I'm just going to eat, you know, change this or that.

No, there are a lot of things. Again, there's so much more biochemical manipulation that can be done in a very healthy way than we were taught. And so the fundamental way we think about retirement and we think about medicine really needs to change.

Amazing. Doctor Patterson, thank you so much for taking the time. I know you, you and I both are in hotel rooms at conferences, meeting with other people, really doing the work of, of changing this narrative.

And I couldn't be more grateful to you for your support of Marama of our of, you giving me the tools so that we could have this impact on on the lives of those who are suffering essentially unnecessarily at this point.

Yeah, yeah, you're absolutely right. And I think many places are, you know, ignoring the wonderful data that are coming out from numerous places like yours.

And therefore they're, they're putting people, unfortunately, at risk. And so I look forward to a day when we really can make these problems rare. And congratulations once again and all the great work.

I really look forward to reading about your exciting results in your trial. Thank you again.