Detect Alzheimer's EARLY with This Simple Blood Test! Transcript

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Introduction to the new Alzheimeru2019s blood test

This is now a blood test that can be ordered by a specialty clinic, so by a neurologist, as a test to determine whether or not Alzheimer's disease is there.

What the goal for a lot of us really is, is to move towards a way to screen. I firmly believe that in the next several years we're going to get to the point.

that this will become an eventual screening tool. This test can be ordered and based on the feedback doctors can order it now. It is FDA approved and it provides remarkable information to the physician that wasn't there before because it's really been vetted.

One of the things we're going to see over the next several years is not just how do we treat the disease when someone has been diagnosed based on a clinical presentation, Now opportunities to treat the disease, even before there's an indication that there's something going on, that becomes an opportunity.

So I think the next 10 years are going to be remarkable, and I'm really, really excited about the work that's going on, both here, but also globally on this.

Hey everyone, this is Jonathan Marks from GoToHealth. How are you today? I wanted to share a groundbreaking story out of the University of Nevada, Las Vegas, that's UNLV, that could change how we detect Alzheimer's disease years before symptoms even appear.

The FDA has just cleared the first blood test for identifying patients with amyloid pathology, and we will explain that, that's associated with Alzheimer's disease.

And part of the research behind its approval was conducted by leading experts in the UNLV Medical School's Pam Quirk Health and Biomarker Laboratory. The blood test helps detect Alzheimer's at an earlier stage and more efficiently than traditional methods and opens new doors for prevention strategies and therapeutic trials.

The lab is co-led by renowned brain health researcher and UNLV's Department of Brain Health Chair, Dr. Jefferson Kinney. Jefferson Kinney, PhD, is the founding chair of the Department of Brain Health in the Kirk Kerkorian School of Medicine at UNLV.

Dr. Kinneyu2019s research on early Alzheimeru2019s pathology

He investigates neurodegenerative disorders, including Alzheimer's disease, vascular dementia, and Parkinson's disease. And before we interview Dr. Kinney, studies show that acts of gratitude improve your well-being.

So here's your chance. Leave us a five-star review, please, on Apple Podcasts, Spotify, YouTube, or wherever you are listening to us and help this show grow.

It's free, takes just a second, and gives you a little dopamine hit, too. So welcome to the show, Dr. Jefferson Kinney. How are you today? I'm doing well.

Thank you for having me. Good. So what have you found out about the development of Alzheimer's disease in the early stages? So that's a very good and very broad question, right?

So there's an awful lot of work by my lab and hundreds of other labs that are really trying to understand the start of the pathology, how the pathology progresses, how it relates to what is seen clinically, and now also into how to deliver treatments that actually can impact slow or eventually arrest the progression of the disease.

My laboratory is primarily focused on identifying what are called biomarkers, so biological targets primarily from blood that indicate that Alzheimer's disease is there, but it also allows for a way to investigate mechanisms for what is causing the disease.

and what is driving what we see in Alzheimer's disease. So we have projects that are focused on the amyloid pathology, some on tau. One of the centerpieces of a lot of our research is on an inflammatory response that persists in the brain in Alzheimer's disease and how these three things work off of each other to cause what we see as Alzheimer's disease as well as the progression of Alzheimer's disease.

Great. So let me go back to some basics. I have two questions for you. What is Alzheimer's disease? So Alzheimer's is a form of dementia, right? So it's many people sometimes think that it's the global description of dementia and it's not.

It's just the most common form of dementia, in particular age associated dementia. So it's characterized by a progressive loss of memory. So as the disease progresses, the loss of memory moves backwards in time.

The official term for that is progressive retrograde amnesia, which is really just a fancy way of saying that information is being lost progressively backwards over time and what comes along with that is also difficulty in short-term memory in performing some tasks and this is usually why a loved one refers or has you go has someone to go see a doctor that's then referred to a neurologist.

Got it. So when you say backwards in time, I'm assuming that means I can't remember what I had for breakfast or what I just said, but I can still remember what I wore on my second grade photo shoot.

Yeah. I think you have it very much there. It's that the last five years becomes less descriptive, and then it'll move to 10, and then it'll move to 15, right?

We oftentimes hear about people recognizing photos of their kids very well, but having difficulty, at least in the more advanced stages, for their adult present-time kids, right?

So it's moving backwards in time throughout that.

Understanding Alzheimeru2019s, amyloid, and tau

Okay. And what is amyloid plaque? What is amyloidosis? Is that part of Alzheimer's? Is it different? Yeah, it is. So there are really two key pathological features of Alzheimer's disease.

The first are amyloid plaques. And these are basically the reason for the name. So they're composed mostly of something called beta amyloid. What this largely is is a protein.

So it starts as something called the amyloid precursor protein. And it has a number of functions, we're still doing a lot of investigating of that. But as it is normally supposed to be cut up, cleaved away, and thrown out, a very specific version of it, in case anybody, you know, watching or hearing this, it's really the A beta 42. So it's this little 42 amino acid fragment.

It is sticky and it isn't very good at being disposed of. So these little tiny pieces start to stick to each other and eventually start to form these masses which are the amyloid plaques.

So this is outside of cells and it's the first real pathology in this disease. What we largely know is that amyloid is starting to accumulate 10 or 15 years before someone presents clinically in a way that would reach a diagnosis from a neurologist.

So an awful lot of the work of my group and a lot of others is trying to figure out why amyloid starts to accumulate. And if you can detect it earlier, that gives you a head start on the disease.

If you want, I can talk about tau or we can focus on amyloid, whichever you would prefer. It will tell us what tau is now that you brought it up. Yeah.

So tau is the other, it's the other core pathology. So it comes later in the disease. So amyloid begins, you know, many years before someone presents clinically of memory problems, processing problems, things like that.

How is something very different so how is a protein writing protein here is just the thing that does something. How is a protein that's part of these tubes within cells that basically help cells hold their shape but also service the highway for transportation of proteins in and around the cell.

So tau is this protein that does a great job of stabilizing these highways. But what happens in Alzheimer's disease, and again, this is later in the disease, this is well after amyloid is, the plaques are present.

Tau starts to what's called hyperphosphorylate, which means it is, a phosphate group is added and it basically comes off of its position and they start to stick together.

These tangles are inside cells. So the progression is from the amyloid initially and amyloid is not closely correlated with cognitive difficulties, learning and memory impairments.

Tau comes later, but the tau tangles, so these masses of tau within cells, that actually is very tightly correlated with the severity of what's going on in Alzheimer's disease.

And how do we spell tau? Tau is T-A-U. T-A-U, okay. T-A-U, so in this field, the conversation is always about phosphorylated or hyperphosphorylated tau.

It's just a fancy way of saying normally tau has this job that it stabilizes the microtubule. Something needs to go walking by, it gets phosphorylated, it comes off and that allows something to go traveling by, phosphates removed and it reattaches.

In the disease, it's hyperphosphorylated, meaning it's staying there and it's detaching from its spot. Now, these start to stick together into small masses within neurons.

If you can speak to this, what are signs and symptoms that patients might and families might be looking for in early Alzheimer's onset? Yeah, so I mean, I can to some extent, but I really want to make sure and highlight some, there's some really great resources out there from the Alzheimer's Association and several other organizations about, you know, the 10 warning signs that are of concern.

So difficulty in remembering some information is sort of a general one, but having difficulty following directions, getting lost on driving somewhere that they know that someone knows really well and having trouble following directions.

I would really, really urge anybody who's actually watching this, look up the Alzheimer's Association of the 10 Morning Signs. They've been tried and true to be very, very helpful for people to look for something with Alzheimer's disease.

Good. So tell us, how does this blood test work? What do people do for it? Is it approved by the FDA? Can people get it at this point? Tell us all about it.

So this is actually really huge in our field because it's a really big leap forward in what we can do for both diagnosis, but also in clinical trials and just across the entire landscape.

Early warning signs and symptoms to watch for

So what was recently FDA approved, so this was just back in May of this year, is a test for, it's actually a specific epitope, a spot of this tau marker.

So it's called P-tau 217. as well as another one which is an A beta 42 which I mentioned a moment ago from blood. So the effort here is largely if we know that the disease, if we know that the amyloid plaques are occurring up to 15 years before someone presents clinically, it means there's an opportunity to detect it earlier and it means that there may be opportunity to try and treat it earlier.

So Treatment up until fairly recently has been only after someone presents clinically and by then there's an awful lot of this pathology going on. So there are a number of blood tests.

There are also tests that have been performed on cerebral spinal fluid, so for what's circulating within the brain, but that can be more difficult to get samples for.

So what this blood test really does is the platform basically measures the amount of this p-tau-217 and this A-beta-42 each of those proteins separately in the blood and provides a ratio.

And based on that score, what it's basically done is defined a lower region, which is if the score is below this point, Alzheimer's disease is not of great concern.

We seem to be totally okay. A score above a point, which is indicative that this is likely Alzheimer's disease is starting here. and can be either confirmed with another test or some docs will be able to act on that and a fairly small indeterminate range that we're just not sure.

But what it means is that The clinical diagnosis of Alzheimer's disease can be gotten wrong, right? And it's based on a series of both tests of the patient, but also information from a caregiver, from a partner.

And this makes the assessment on the fundamental biology.

How the FDA-approved blood test works

Now that there are a couple of FDA approved treatments for a very specific phase or early phase of Alzheimer's disease, This opens up the possibility for being able to screen for who is eligible for those treatments far faster than is available right now and far more cost effective.

Got it. And is this a blood test you do once for your lifetime or you do it once every year or once every five years? How often do we do this? The where we are right now, which is this is now a blood test that can be ordered by a specialty clinic.

So by a neurologist as a test to determine whether or not Alzheimer's disease is there. What the goal for a lot of us really is, is this and others. So this isn't the end of the blood test.

This is the start of them. Okay. Is to move towards a way to screen, right? So all of us go to the doctor every year and they screen your cholesterol to let you know whether or not you have risk for cardiovascular disease, right?

I firmly believe that in the next several years, we're going to get to the point, but it's going to take some time for the science to demonstrate it and flush it out.

that this will become an eventual screening tool. For now it really is if there's a concern of whether or not Alzheimer's disease may be present, this test can be ordered and based on the feedback doctors can order it now.

It is FDA approved. There are a number of clinical sites that are actually already doing it and it provides remarkable information to the physician that wasn't there before because it's really been vetted and it It has, I didn't really jump into this, but the reason why we know this works is that to prove it out was to show that levels in the blood of these targets map well onto levels of amyloid in the brain.

That's been very well characterized, which is why it now has been able to receive the FDA approval. Let me give people a link where they can go to learn more.

And I've created a special link that's easy for you to get to. It's bit.ly, B-I-T dot L-Y slash U-N-L-V dash Alzheimer's. It's bit.ly slash U-N-L-V dash Alzheimer's.

U-N-L-V stands for the University of Nevada at Las Vegas, which is where Dr. Kinney works. I understand, doctor, that you're also studying diabetes and inflammation in the brain.

Tell us about that. Yeah, so like many of my colleagues, we all have several very pockets of specific interest in this disease. I'm actually a basic scientist by training, so I'm not an MD.

And my primary focus in research has largely been on understanding the mechanisms of what causes Alzheimer's disease. So one of our projects is the third sort of pathology that is, especially over the last 15 years, really been highlighted.

So there's the amyloid and then there's the tau, but there's a sustained inflammatory response in the brain in Alzheimer's disease. To be fair, it's also present in Parkinson's disease and in Tauopathy's.

This is a feature of neurodegenerative disease, but it's not the same in these different diseases. So part of the work that goes on in my laboratory is trying to understand both what that inflammatory response is contributing to amyloid in Tau.

but also trying to look to see whether or not there's ways to intervene in it that may serve a role as a different way of treating Alzheimer's disease.

So what's currently FDA approved or what are called monoclonal antibodies for amyloid, it basically triggers the immune system to go attack the pieces of the amyloid plaques.

And that's a way of pointing the big bully immune system after disease pathology to try and clear it. Part of what we're doing is trying to mechanistically understand how the immune system gets changed and what is altered in that.

Inflammation, diabetes, and brain health research

A small piece of that is actually the other one you mentioned. So we've had some research funding. There are a number of things that confer increased risk for developing Alzheimer's disease, diabetes being one of those.

So people with type 2 diabetes are about one and a half to four fold more likely to develop Alzheimer's disease. Definitely not a cause, but it's a higher risk.

And that presents a rather unique opportunity for researchers like me to try and understand what's going on in diabetes that may associate with the onset of this disease.

So we've done a number of investigations of looking at a few specific features of diabetes and how they relate to tau or amyloid or inflammation. as what you see in Alzheimer's disease.

And there are some connections. We have some pieces that some of what happens with diabetes results in changes in tau that is consistent with what's seen in Alzheimer's disease.

So we're making headway. This isn't solved yet, but we're making headway at understanding that relationship. Talk to me a little bit about the growing role of your research at the University of Nevada, Las Vegas, and how that fits into a national framework or a national map of research.

Yeah, no, thank you for the inclusion. So UNLV has been a growing research enterprise for several years, and anyone in Nevada knows we reached the R1 research designation.

One of those areas that I've been a part of from the beginning is growing neuroscience at UNLV. About six years

ago a small group of us started a new department here which is called the department of brain health.

I have the privilege of continuing to serve as the chair of that department but we have a really really strong interdisciplinary team within this department that includes my laboratory which is very the biomarkers in cell molecular neurobiology.

with one of the forerunners in the world and a researcher by the name of Dr. Jeffrey Cummings who he was this year rated number one in Alzheimer's disease clinical research in terms of publication.

who focuses on tracking clinical trials, on tracking the progress that we're making in treating this disease. We also have a faculty by the name of Dr.

Samantha John who does some remarkable work on health disparities in aging and Alzheimer's disease. So not a lot of people really know this is that Alzheimer's disease is more prevalent in minority populations.

The progression of the disease is faster and we don't know nearly enough. about why that is, and Dr. John's focus is primarily focused there. And then we also have a really new addition to our department, Dr.

Lena Nee, who does some remarkable stroke recovery work and fits within this brain health effort. But we've been fortunate in a number of grants and publications and impact of our work that the Department of Brain Health through collaborations through the work that we're doing here have been able to make a pretty sizable impact into this field.

Very impressive. And here we are just in Las Vegas. That's great. That's good. Good. So I always like to ask near the end, what question haven't I asked you or what message would you like to leave with people today?

Yeah, I'd say probably it's less of a question, but it's one of the ones that I get most often, right? Which is, has there been progress? Like, yeah, is it, are we optimistic or is it, are things sort of just cruising along.

And I do like to highlight to anybody I get a chance to, the progress over the last five to 10 years has been remarkable. We had two treatments that got FDA approved a few years ago.

And the last time that happened was 2003. So there's a jump here. And there are a number of treatments that are in clinical trials now, a couple that read out this year that are looking really promising.

UNLVu2019s brain health program and future outlook

The biomarker work becomes field changing because the detection of the disease now moves to, there's a concentration based on what's in blood, but that has the remarkable opportunity to move further and further and back, which means one of the things we're going to see over the next several years is not just how do we treat the disease when someone has been diagnosed based on a clinical presentation, now opportunities to treat the disease even before there's an indication that there's something going on, that becomes an opportunity.

So I think the next 10 years are going to be remarkable. And I'm really, really excited about the work that's going on, both here, but also globally on this.

Wonderful. Good. So remember, again, you can find out more by going to this link that I've created. It's bit.ly slash UNLV dash Alzheimer's UNLV dash Alzheimer's.

Dr. Jefferson Kinney, it's been a pleasure speaking with you. Really wonderful to hear about the work that you're doing. We're both here in Las Vegas, so it's nice to know you're local, me at least.

Anyway, it's been wonderful having you on the show. Thank you for coming. Thank you very much. Good. We've been talking with Jefferson Kinney, PhD. He's the founding chair of the Department of Brain Health in the Kirk Kerkorian School of Medicine at UNLV.

He investigates neurodegenerative disorders, including, as we've heard, Alzheimer's disease, vascular dementia, and Parkinson's disease, with a focus on cellular and molecular changes in the brain that underlie these disorders.

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This has been Jonathan Marks with go to health We'll see you again next time and remember as we say at the end of every show Go to health. Take care. Bye.

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