

## The Brain Trust Podcast | Episode #13

### Transcript

#### **Moderator: Kate Rowland, MD**

Welcome to the Brain Trust, A Physician's Guide to Diagnosing Alzheimer's Disease and Related Dementias. Brought to you from the Illinois Academy of Family Physicians. I'm Dr. Kate Rowland, family physician, member of the IAFP and faculty at Rush University. Funding for this podcast series was provided by a grant from the Illinois Department of Public Health. The goal of the Brain trust in this podcast series is to educate and empower the primary care clinician in the early detection, diagnosis and management of Alzheimer's disease and related dementias.

Clinical resources, Free CME and other educational materials are available online at [theBrainTrustProject.com](http://theBrainTrustProject.com). CME Credit is available for each podcast. The Illinois Academy of Family Physicians is accredited by the Accreditation Council of Continuing Medical Education to provide continuing medical education for physicians. Information on how to receive credit can be found on the Brain Trust Project website.

Thank you for joining us. As we empower each other and provide training on the early detection of Alzheimer's disease and related dementias. And now today's episode.

#### **Host: Raj Shah, MD**

So welcome, everybody to the Brain Trust, our podcast series about the early detection of Alzheimer's and related dementias. My name is Raj Shah, and I'll be your moderator today. I'm a professor of family and preventive medicine at the Rush Alzheimer's Disease Center at Rush University in Chicago. And today, we have a wonderful and very innovative and exciting session where we'll be talking about how we best utilize information and the electronic health record to assist primary care physicians, family physicians, and the early detection of Alzheimer's disease and related dementias.

And our hope today, as far as some of the learning objectives is that will go over some of the tools that can be used to screen for dementia that are can be discretely stored within the H.R. or electronic health record and tracked over time. And we'll discuss some of the future directions, the good, the bad, the ugly about the use of augmented intelligence or artificial intelligence and the early detection of Alzheimer's disease and related dementias.

So I've had the pleasure of driving almost two and a half hours down I57 to meet our guest today, who's welcome at the University of Illinois, Urbana-Champaign. And that's Professor Ravishankar Iyer, who's the George and Anne Fisher, distinguished Professor of engineering and professor of electrical engineering and computer science at the University of Illinois at Urbana-Champaign. Dr. Ayers, also an affiliate faculty at the Mayo Clinic and also at the Carl College of Medicine.

And we're really glad to be able to spend some time with him today. So, Dr. Iyer, thank you for allowing me to stop by at Urbana-Champaign and to meet you today.

**Guest: Ravishankar K. Iyer, PhD**

Great to have you here.

**Host: Raj Shah, MD**

All right. And I think we also have a special treat that we've been able to call in, your colleague that you've been working with at the University of Illinois Chicago campus, and that's Dr. Carl Kochendorfer, who's the assistant vice chancellor for Health Affairs and the Chief Health Information Officer and Associate Chief Medical Officer. Carl is also an Associate Professor of Clinical Family and Community Medicine at the University of Illinois Hospital and Health Sciences System.

So, Carl, I think we've got you online with us today. Hopefully you can hear us. Okay. How's it going?

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

Thanks. I can hear you just fine.

**Host: Raj Shah, MD**

Thanks for all of being here with Ravi today. I probably should have done it the opposite way where I could have walked over from Rush to SIU Carl just about 10 minutes away, sort of driving two and a half hours.

But it's always nice to take the route down 57 to go to Urbana-Champaign. So today, yeah, we're going to talk a little bit about sort of how we best help primary care physicians in this sort of conundrum of early diagnosis. And maybe if I can just frame it up at is if you think there are younger people that get Alzheimer's disease and related dementias, but the population most at risk around the world are people over age 65.

And in the United States, we're already at about 56 million people that are over the age of 65. And in the next 30 years, we estimate that to grow to about 90 million and we're not going to grow our primary care workforce to match that and especially to go one by one in annual Medicare visits to be able to identify every single person at risk and to do it every year.

So it's going to take us some, you know, novelty about how do we scale things and use resources we already have available. So I was curious, Carl, we have you on the phone. I would just add your practice in the unified system, sort of what are the patients you're seeing in your primary care practices, especially the ones that risk for dementia? If you can just give us a sense of what you're seeing here

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

Sure, just give you a little background. You know, I practice at our University village clinic location within UI House, the health care delivery arm of a University of Illinois, Chicago. And we have a very diverse patient population, you know, for moms and babies, to many students at UIC, to many older adults with many chronic conditions, about let's say 40% of our patients have Medicaid as their insurance.

That's for a racial and ethnic mix of our patients. It's maybe about 40% African-American, 30% Hispanic, or 20% white, not Hispanic, and maybe 6% Asian. I'm not a geriatrician. I'm not an Alzheimer's expert. It

can be hard sometimes to get any of my patients into our memory clinic. So, you know, we have few geriatricians in our organization, even in an academic health center.

So I'm just a practicing family doctor who, you know, does his best to try to meet the needs of my older patients. And I try to leverage technology whenever I can and wherever I can to help me be more efficient and take the best care of our patients.

**Host: Raj Shah, MD**

Yeah. And tell me a little bit about that background, because we've known each other a long time.

Carl, you know, from medical school days at the University of Illinois, Chicago. I mean, you have a combination where I can see your interest in chi using and the positions you've also taken apart from being a practicing family physician and an academic center with the work you've been doing around informatics. Can you give us a little bit about your background also in so your training and before you went to medical school?

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

It's really been my calling for many decades. I think it was even in high school when I realized I had had a very prescient brother who shared that there'll be a future in computers in medicine. And I had kind of background in program computers when I was a kid and went on to get a computer science degree from the University of Illinois at Urbana-Champaign, but also do my pre-med requirements at the same time.

And it was nice that they allowed us to do a have a goal directed sequence. Once a practical experience, I worked in industry, worked up in the suburbs of Chicago at Baxter Healthcare when they were a Fortune 100 company, but they always knew I was going back to med school at some point, and I eventually did at that.

UIC And you're a wonderful mentor as two years older in med school that you guys did a great job of orienting us as first year medical students, and I always appreciated that. I think when you were president of your class, so really it's been a lifelong love of trying to be able to leverage technology and computers. I didn't know for about ten years that the field is called informatics.

I think I was walking the halls of the medical school and they had a sign up on the wall that said, Are you interested in computers in medicine? It was, Holy cow, it's speaking to me and it's there. And they said, come to NIH and the National Library of Medicine. So I spent two months there during medical school and learned from some of the founders of the field.

And it was a great experience. So just really try to tie that into my career and leverage technology to help be a better primary care doc now, but also to help other clinicians use technology to deliver better care for their patient populations as well.

**Host: Raj Shah, MD**

And that's great. And then Ravi, how did you end up meeting Carl, or how did you start working together and get to know each other?

**Guest: Ravishankar K. Iyer, PhD**

It was a fortuitous event. We've had this Center for Genomic and Computational Medicine, funded by NSF and supported by several companies. For some time. And Carl came to one of the meetings and we started to chat and it became very clear to me that the kind of breadth that Carl had and the kind of questions that he would bring in are really a function of the kind of patients that the diverse patients he sees in Chicago and their problems.

And of course, you know that their aspects of this seemed to me very, very relevant for studying dementia and the brain related neuro disorders that we were studying. So that came an opportunity for us to write a proposal together to the Discovery Partners Institute, which had just about formed, I think, and that was on neurodegenerative diseases. And that, you know, we just sort of took off, I think his, his ability to go and bring in a patient perspective and take these tools and methods that we were discussing and give us feedback, I think has been very, very valuable.

**Host: Raj Shah, MD**

That's terrific. Now, it sounds like you found yourself and found lightness and complementary ness. That's really important. And team based science and how we work together to solve these complex problems. And Carl, I just wanted to get back a little bit into that complex problems that you see in your practice and that's, you know, we invest a lot of time as family physicians, as primary care physicians, and entering information into the electronic health record in hopes that it delivers some more information back to us.

That was always sort of the promise of, you know, working in electronic health records that it will be, you know, once you digitize things and you collate and organize them, they become easier to search and find information than, say, going through written records that aren't as structured. Where do you think we're at right now and sort of leveraging sort of what is in the electronic health record to identify early the diagnosis of a condition like Alzheimer's disease? Where are some of the, you know, things that are working well? Where are some of the opportunities where we may consider improvements so that we can get the most out of that information? We've been entering?

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

Yeah, no, absolutely. I mean, no one wants to just be a data entry clerk and for many years it feels like that's what we've been, you know, one of the biggest sources of data, I think, you know, will become the patient suit that we don't always have the time to do the screening in our 15 or 20 minute visits, and we can try to get our extended staff medical assistance to try to help input some of that data.

But there are getting strapped just as well. So you really know, making some of these tools available to patients to to complete before the visit, you know, is really important. And they're the ones, you know, that that do have a little bit sometimes more of the time to make sure that this data can get entered. So I think that's a huge still and somewhat untapped resource for us to to make sure that we can make it easy for patients to be able to do this kind of work on when they don't or can't.

And obviously in the clinic, maybe still the best time to do it. You know, it's just really important to get the data in one place that we can start to build on. And to me, some of the basics are, you know, we learn the many mental status exam in medical school and we know as a first faculty position at the

University of Missouri, a geriatrician taught me about the mini cog and I love the tunes and simple quick way to screen.

You know, more recently, I've utilized tools like the MOCA and now we've gotten some grant funding with Northwestern to, to work on deploying the patient record on outcome measures and other functions short form, you know, that can be used through that as well. So there's lots of questionnaires that are out there. But I think getting them I think some have pointed out sometimes there can be a proprietary nature to some of these.

Sometimes you can just get permission to do it. And I'm not just putting the score in. If you can't put the whole screening instrument inside the medical record, you know, working with your IS group, if it's not already in your electronic health record, you know, usually there is some way to get at least one of these forms in there.

And to me, this is just kind of the basics and starter setup. You need something. And even if you can't, like I said, to do it all electronically or there might be some permission issues because you end in trying to do a clock draw. Obviously you want to have patients do that on paper and if you can't get them to do it electronically on a tablet, you know, just even putting the ultimate score in there can be useful that can be tracked and graphed over time, I think is important as a first starter set.

So lots of opportunity to do this better. You know, I think we're at a cusp of, you know, making this more accessible and making more accessible to patients. The clinicians, I think, you know, there's a huge growth that's going to be happening now that a lot of this stuff, the basics have been done and that's where I think, you know, we hope we can take it to the next level.

And that's where it's been great to partner with somebody like Professor Ayer and his team to, you know, look at ways to do novel ways of using the data that's in the future and coming up with more sophisticated predictive models beyond just a a simple screening tool.

**Host: Raj Shah, MD**

Yeah. And Carl, you know, you bring up an interesting point. As you were talking and I was listening, I hope Robbie could maybe comment on this.

That's sort of like when we get streams of data, right? What you just expressed, Carl, is there's a lot of choice out there about how people can document, you know, a cognitive screening tool. And there's many cognitive screening tools and people pick different things, right? So there's ways you can handle that in data, right? One of them is standardization, right?

Uofl will I will only use this tool. Everybody needs to learn it. Everybody needs to use it the same way. And then the other way is that you kind of figure out that you have these diverse tools that might be answer it in slightly different ways and versions that are modified because the physicians practice. They won't do it exactly the same way with fidelity all the time.

Is there an opportunity, I guess? Me If you think about it from a data side, right, based on how do we use these sort of diverse tools that are complementary, that are not perfect without having to go and say, we

can't use any of this because you didn't use all the same measures the same way. Is there a way to save information? I guess, you know.

**Guest: Ravishankar K. Iyer, PhD**

It's a very good question. You know, and it's sort of the brings us to the root of how and why, but how do we process information? We process information that is mostly it's God knows it's somewhat imperfect, but in that a sea of uncertainty and things being imperfect, we are able to go and make very good decisions, I should say.

You guys, you and Carl and neurosurgeons. And this is continuous to happen. And all we started is to say, why is it that we can't invent a process that also learns much the same way as we learn and can get better and develops an understanding of the underlying science or takes advantage of it. The similarities between the tools then become more important when you actually do the analysis than the differences, because differences sort of fade into the noise, which can be handled similarly.

**Host: Raj Shah, MD**

Interesting. And thanks for bringing that perspective. You know, about handling diversity of data because I think that's been a struggle, right? Like everybody feels like, Oh, we can't use this because we're all using this in different ways. And then people struggle because they've learned certain things in their career, different ways to screen for cognition that they'll have to relearn and retrain.

But if there's some ways we can save this information and find that same ness, as you're saying, and the data rather than the differences that can help us and if I can build on that a little bit is for our audience, right? There's sometimes a fear as they're hearing about these data driven tools, about using things such as an AI.

And for many, that's, you know, symbolizes artificial intelligence or AML or machine learning as these sort of practices of iteratively growing and learning with information. Tell me a little bit about your view of sort of what are we going to need to deal with a condition like early diagnosis? Do you sense like the computer or the data streams and the models we use will replace the human or the trained physician in that experience?

Or is that something more of augmented intelligence where it's the tools with highly complex, highly diverse data at large volumes being organized in a way that can help people that are ready to pick up their own intuitions and clues as humans and those two things to work together. Where do you see this kind of going? Is it going to be more the replacement model or kind of this augmented model?

**Guest: Ravishankar K. Iyer, PhD**

You know, this is this is also a very good question, as Carl and I often discuss this very early on when I, I think first went to Mayo Clinic and they asked me to come and give a talk. And here I was, you know, very proud of my work. I thought, boy, I really can give a and these surgeons me very, very early, much too early for us.

And I started I said, look, we have built these tools that can do this and it can do that and it can really tell you know, the surgeons where which are the boundaries of surgery. And as soon as I said that one of

them put up his hand and said, look, I have to tell you this, imagine you are lying on my operating theater, my operating table, and they're giving me all this information about you.

But when I open you up, what's inside is not really the same as the information that I have. So he sort of flicked this thing goes, said, I have to make a decision like this. And you said your machine, Ravi, will never do that. And I you know, the whole audience broke up into laughter at that, made my response so much easier.

And I said, you know, it's not going to replace you anytime soon unless it's possibly the robot that becomes intelligent, but it's going to help you. And in the end, I think it's going to grow much like our knowledge of medicine will grow and the physician, the human and the machine. I believe, will be very good partners. And he came up after that and he said that was a great answer.

I would really like that. And I sort of built a friendship for over a long time. So I believe that's what is happening. We are learning from the data. We are also we are incorporating into the artificial intelligence models, the domain knowledge, the expertise of people like you, Raj, people like Karl, and the domain expertise of the neurosurgeons and their understanding the impact of recent drugs.

When you do that, you are really underlying the learning and the iterative process by which the machine learns becomes much closer or is becoming closer and closer to the iterative process through which we learn.

**Host: Raj Shah, MD**

Yeah, and that's the key thing. I think we; we think these are static, right? Like because we've always thought of them as algorithms that we use, and we plug in a value from one time point and that's going to tell us what happens to the future. But these systems we're talking about our iterate, they've got to learn and see as new information comes in, how do we get better?

And that's sort of the longitudinal nature of this, where we're constantly learning. But I wanted to bring up just, you know, a little bit about two issues and then I want to finish on sort of where you are doing your work together. And the first one is apart from data being very diverse, there is a missing now, sometimes there's not complete data for somebody in information and some of that missing ness is not missing ness random. It could be due to issues around who gets access, who gets to be seen, who gets time to get questions answered. So. So how do we handle from a data side, questions around missing ness and fairness of our learning that we do to gather and improve and reduce some of those biases by what we train our machine learning on?

**Guest: Ravishankar K. Iyer, PhD**

Let me take a crack at it and then I think I'd really love to hear what Karl's view is. This is something that the math doesn't do very well. Fairness is not something that the math does very well. So we are we are really learning something that is new and important. People may not show up because they didn't have a good experience the time before.

They are getting older and they sort of think, is it really worthwhile for me to go? Consequently, what happens in in dementia kind of situations is the gaps between the subsequent assessment of the

patients. They're not always concerned or near each other. So you have to just like, you know, the physicians sees you at different times. The machine has to learn to go and accommodate for that.

And it accommodates in this case because dementia is a slow moving disease. So that kind of accommodation is easier. The fairness, is something that has really come to for and I must say, of all various places in the in the US that I've seen fairness being handled, the diversity is probably handled better at Chicago than anywhere else that I've seen.

So I really applaud you guys, the UI Health, for bringing even more people into it. The clinics that you have in the field and the ideas of having these innovation clinics, I think is the way to go to reduce bias and fairness, which we all acknowledges there and is very much present in health care.

**Host: Raj Shah, MD**

Yeah, and yeah, Carl, if you wanted to add a comment on that about sort of the, you know, the aspect of fairness and how we want to deal with that.

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

I think it's important that we're also engaging our patients in the outcomes that we're trying to achieve and the communities that we're working. And to me, you know, making sure that we're building any models on, you know, diverse patient populations is key.

And I think that's the crux of what we're trying to make sure that we can add and bring to the table. University, Illinois. So I think that's really important. And I love the fact that you use the word augmented intelligence. I think I heard that five years ago when I met Professor Aya at the Mayo Clinic, at a conference, AI conference.

And it's really stuck with me that, you know, there are certain things I wouldn't mind if I would replace me having to write a prior off. But there's other things that, you know, holding a patient's hand or comforting them, you know, it's never going to do. And so I think there's a role for it to help and assist us to be better clinicians.

**Host: Raj Shah, MD**

Yeah. And as we wrap up then for today, I just wanted to ask your viewpoints on everybody wants this or assumes that this technology, these capabilities are going to be showing up at our desktop tomorrow, right. Like we'll be able to use chat GPT or something like that to ask does this person have a dementia right? What is your thoughts or what is your prognostication sort of the work you've done as how much steps do we have to take before these become sort of commercially available in practice?

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

I mean, it is moving fast. You know, our vendor has at a national conference just a month or two ago demonstrated that they are embedding chat CBT into an electronic health record to pilot to test it. And there were some times where I thought I did a better job than I could in responding to a patient's message.



And sometimes they're saying that it's more empathetic than sometimes what I might write, but I'm hurried in and out of time. But it is moving fast, but it will take some time. And that's where a lot of the hard work is, is how to embed this into the workflow of busy clinicians. And we still got a long way to go but it's it's happening so takes

**Host: Raj Shah, MD**

yeah you know for a short like quick summary today in our 30 minutes we really appreciate both your time today Dr. Koka Darfur and Dr. Iyer letting me visit with you and talk about an area of growth that has a lot of interest in primary care.

And we'll wrap up our session today and really appreciate both of your time and look forward to our next session of the brain trust coming up in the future. Thank you so much. Talk to you later.

**Guest: Karl Kochendorfer, MD, FAAFP, FAMIA**

Thank you.

**Guest: Ravishankar K. Iyer, PhD**

Thank you. Bye bye.

**Moderator: Kate Rowland, MD**

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