

Speaker 1: The HD Insights Podcast is brought to you by the Huntington Study Group. The Huntington Study Group is a nonprofit research organization dedicated to conducting clinical research in HD and providing critical training on HD to healthcare [00:00:30] professionals. Funding for this podcast is made possible through the generous support of listeners like you and sponsorship grants from organizations like Genentech, Teva Pharmaceuticals, Neurocrine Biosciences, Vasonex, and WAVE Life Sciences.

Kevin Gregory: Hello, and welcome to the HD Insights Podcast. Thank you for joining me today. As always, I'm Kevin Gregory, director of education, [00:01:00] communication, and outreach at the Huntington Study Group and your host for this program. There are a lot of well known commonalities for people with Huntington disease. Chorea, for, example is probably the physical symptom of HD that most people are familiar with. But there are other motor symptoms, behavioral symptoms, or cognitive symptoms that are part of the lived experience of HD. On this episode of the HD Insights Podcast, we dive into a feature that you probably wouldn't have otherwise thought [00:01:30] of in terms of progression of Huntington's disease, and that's speech.

Kevin Gregory: Dr. Adam Vogel is professor of speech neuroscience at the Centre for Neuroscience of Speech at the University of Melbourne. His team works on improving how we recognize, describe, and treat communication and swallowing deficits in people with progressive neurological disorders, including Huntington Disease and Parkinson's Disease. Back in November of 2019, Dr. Vogel was selected as a platform presenter [00:02:00] to share his research with the full audience at that event. I found his research intriguing and wanted to provide him a platform to help raise awareness to that research and the potential it could bring to the HD community. So without further delay, here's my conversation with Dr. Adam Vogel. Well, Dr. Vogel, we really appreciate your time today and thank you for joining us here on the HD Insights Podcast.

Dr. Adam Vogel: [00:02:30] It's a pleasure, Kevin, thank you for having me.

Kevin Gregory: I guess I want to start off... I know it's some really challenging times. So first of all, I know you're in Australia, so it's the start of your day. It's the end of my day here on the East Coast in the United States. But just how are you and your family doing during this whole pandemic? Specifically, how are things in Australia? What steps have been implemented where you are regarding everything that's going on with the COVID-19?

Dr. Adam Vogel: [00:03:00] It is a very interesting and different time for everybody. In Australia, we've had a lockdown for a couple of weeks now, which means all nonessential travel is banned. We have to remain in our houses unless we're going to go to the supermarket, very similar to the East Coast. We're very lucky over here, though, because we have very few cases of COVID-19 confirmed, which means out of the 25 million [00:03:30] people that we have here, only about 5,000 at the moment, I'm sure that the number is increasing daily, are affected by the

virus. I'm trapped in the house with my two kids and my wife. I really enjoy getting away and traveling for work. But at the moment, we haven't had the opportunity to do that. So it's all very new for everybody. Hopefully, it won't last for too much longer.

Kevin Gregory: Absolutely. Well, in the meantime, [00:04:00] we're happy to have you on so we can start to talk about some other topics and take people's minds off of things. I really was very excited to have you on because I really enjoyed your platform presentation in Sacramento back in November at HSG 2019. I guess let's start there. Your research really specializes in work around speech and communications and in particular swallowing in neurological [00:04:30] disorders. Take us back and tell us about what initially got you interested in these functions and this area.

Dr. Adam Vogel: I worked as a psychologist. Sorry, I studied as a psychologist back in the day, and I was really interested in communication as something that would lead me somewhere where I wanted to be able to make a difference. My first job was at the Great Ormond Street Hospital, which is in London, a specialist [00:05:00] service that worked in neuro disability. In that space, I started working with some kids with profound and significant genetic disorders that were affecting their speech and swallowing and working within a team of professionals like psychologists and neurologist and occupational therapist, physiotherapist. I really enjoyed that cross-disciplinary approach to care.

Dr. Adam Vogel: And when I returned to Australia, it's quite a long time ago now, 15 [00:05:30] years, 16 years ago, I looked for a job that was exactly the same. I wanted to work in a big team where we could make a difference for the whole patient rather than just my own specialty. I came across a clinic which has a very similar model. It was in Friedreich's ataxia, so this one of the most common cerebellar hereditary ataxia. It's not dissimilar to Huntington's in terms of how it affects so many aspects [00:06:00] of an individual and their family. So it does affect their speech, and it does affect their swallowing and movement and aspects of cognition, so thinking.

Dr. Adam Vogel: So that got me on the path of working in progressive neurological diseases and being able to ideally make a difference to individuals experiencing those particular disorders. So I work in the ataxias. Huntington's is one of the groups that I work with, and so is Parkinson's and multiple sclerosis. [00:06:30] So you can see that I've got a focus on these progressive neurological diseases that affect adults. There's such a profound impact on communication in all of these diseases. But unfortunately, there's not much evidence supporting some of the work that people do in this space. I think it's a field and a space that we can really make a difference from a research point of view.

Kevin Gregory: Specifically, [00:07:00] then, in regards to speech. You got into working with children. You got into the neurological disorders. What is it about speech? Was that an area that you really wanted to dive into, or was it something that as you

started working more with these patients and in this field that you realized maybe that there was a stronger connection than was really previously known?

Dr. Adam Vogel: I think speech [00:07:30] is so important. I mean, we're doing it now. A life without it is a life that lacks the things that make us human. If we're unable to communicate to our friends and loved ones, that really lowers our quality of life. If we can't communicate clearly, it's very hard to maintain employment. You try getting a job with some sort of speech impairment. It's a very challenging thing even to get through the interview. So [00:08:00] even talking to people on a daily basis asking for a cup of tea or coffee can be a challenge for some people. I want to be able to ensure that everyone has the capacity to communicate effectively. I know that there's new technologies coming on board daily that help with that process. But if we can maintain people's verbal communication, then we're able to maintain so many important things that make us who we are.

Dr. Adam Vogel: [00:08:30] There's always a stress or a focus on mobility, so being able to get around and using our hands and arms and legs effectively. But there is a time in many of the diseases that I work with that those aspects of someone's personality and functioning are no longer working as well as we'd like them to. But speech is something that we can maintain for longer. So you might end up in a wheelchair, [00:09:00] but being able to communicate still is such an important aspect of someone. So ensuring that we can maintain that capacity for as long as possible is a real goal for us in our group.

Kevin Gregory: That's a really good point to follow up on here. You've been involved in some really remarkable work regarding speech as biomarker in Huntington's disease, which is probably something that may not be [00:09:30] as well known to people in the HD community. Like you mentioned, certainly there's the well known cognitive behavioral and motor function type of biomarkers, but how has speech evolved as a biomarker for the progression of Huntington's disease?

Dr. Adam Vogel: You're right. It is relatively new. What we've got a particular interest in is looking at those biomarkers [00:10:00] that change even before diagnosis. So individuals who are carrying the genetic variation in Huntington's may not become symptomatic for a number of years. But there are some subtle signs in people's presentation that suggest that there are changes in brain function. There's a lot of fantastic work in early brain imaging work in this space. As you mentioned, cognition is one of those [00:10:30] markers that can tell us a little bit about function prior to diagnosis or symptomatic diagnosis.

Dr. Adam Vogel: If you think about speech and how it manifests as a behavior, it draws on so many aspects that are involved in thinking and motor movement. When we're trying to formulate thought, just like I'm trying to do now, our brain is working very hard to generate some language, [00:11:00] so the content of what I'm trying to say. What also needs to happen simultaneously is the muscles that are involved in speech, and there's quite a lot of them relating to the lips and tongue and how the lungs are producing air and the vocal folds themselves, all

of those need to coordinate simultaneously with the brain to be able to produce sound. In a disorder like Huntington's disease where there are some changes in brain function and there are some changes [00:11:30] in motor function, you can appreciate changes in speech are going to occur simultaneously in that space.

Dr. Adam Vogel: So we've been looking at how we can measure those changes very early on in the disease life cycle. So this is prior to diagnosis in people who are carrying genetic variation but also people who are very early on in the disease cycle as well. The combined cognitive and language [00:12:00] and motor elements make speech one of those very sensitive markers of change in the disease. It's not easy to measure and sometimes you can't hear these differences, but there are particular ways in which you can measure the speech output which tell us with a bit more sensitivity how speech is changing over time in the disease process.

Kevin Gregory: Specifically, what type of [00:12:30] assessment are you doing? You talked about there's subtle changes. Now, is that something that a person is able to detect, so whether it's somebody working on your team or in a clinic? Or is that very much more something that requires a bit of technical analysis or bringing more computer analysis or even some sort of artificial-intelligent [00:13:00] learning into the fray for this?

Dr. Adam Vogel: Yeah. There's lots of really good points there, Kevin. We have a number of studies within this space that we're focusing on whether or not we can listen to individuals in this presymptomatic, or prodromal, phase of the disease and tell if they have something going on. Now, I have a really good PhD student called Jess Chan and this has been her focus for a number of years. [00:13:30] She's just finished a manuscript which is looking at exploring whether or not we can hear differences in people's speech production. This paper is under review at the moment, so we're not ready to say that it's out there. But there are some very subtle signs in someone's speech that can be perceived by the listener. I'm not going to go through what those are today because I want to get that evidence out there and make sure it's peer reviewed before people are happy with it. [00:14:00] But it's not a straight forward process.

Dr. Adam Vogel: We had a number of, two or three, expert listeners go through samples in a blinded way, meaning we didn't know whether they were healthy controls of presymptomatic individuals or early stage individuals with Huntington's, and then they had to listen to about 20 different aspects of speech and rate their performance on a five-point scale. So there are subtle differences in that space, but I guess there's a huge [00:14:30] limitation in relying on listeners to make those judgments in that when I listen to someone, I've been doing this for 20 years, I can pick up various things that I hear in someone's voice and speech. And someone else who may not have the same sort of experience and expertise may listen and hear different aspects. We may hear different components of speech. But then also applying a rating scale to that is a very challenging task

because my rating will be different to your rating and someone [00:15:00] else's rating. So although we may be able to hear some subtle changes, I wouldn't rely on that particular listening-based approach to tell us what we want to know about speech.

Dr. Adam Vogel: You're right. There are some computer-based analyses that help us in this space. One particular measure or approach that we use is called acoustic analysis, which is effectively signal processing. If you think of other [00:15:30] domains in this assessment regime, something like electroencephalography, so EEG uses signals. Interpreting that information is one way of telling us something about the brain function, and acoustic analysis is one way of telling us something about the physical signal of speech itself. You can use acoustic analysis to provide objective information on speech. When [00:16:00] I say objective, I mean something that's not fallible. So it's something that can tell us exactly what we need to know without human intervention or the biases that come with our own listening and judgments that we bring to an assessment.

Dr. Adam Vogel: The acoustic analysis can measure every aspect of speech. There are literally thousands of different algorithms that tell us about voice function or voice quality, how much control [00:16:30] we've got over our speech, how precise our production of consonants are or vowels, and how important different aspects of timing are in the speech profile, so things like gaps between words, how long it takes to produce particular sounds, et cetera. So within the assessment protocol that we use, we have adopted a protocol that tries to capture all of the aspects of speech that [00:17:00] I was describing before in terms of the cognitive performance relating to producing speech but also the motor elements that are important.

Dr. Adam Vogel: In the talk that we did last year, I went through the protocols that we use which rely on tasks like a sustained vowel. So this is just saying... for a particular amount of time. From that stimuli, we're able to pull out lots and lots of information about voice quality. Then if you have more cognitively [00:17:30] demanding tasks like describing a picture, for example, that's actually quite difficult if an individual has a cognitive impairment because they have to think of what to say while they're also producing their motor movements.

Dr. Adam Vogel: And then you can have tasks that fit in between those two that I've described, something like saying the days of the week, which is something that people have done thousands of times in their life. So there's [00:18:00] no need to think of new or novel language, but there is still that complex motor element to their performance where they have to produce all of the sounds required in Monday, Tuesday, Wednesday, et cetera. So we can use a protocol that draws on demanding cognitive tasks as well as straightforward motor tasks to tell us about the function of an individual using that broad spectrum of performance across [00:18:30] those domains.

Kevin Gregory: That's really impressive. I guess the one followup I would ask... I imagine it's potentially pretty challenging for a patient that's prodromal. But I'm wondering, do you account for other potential factors just in the normal course of life or day-to-day routine that could impact... [00:19:00] So I think of myself in particular. It's a lot easier for me to gather my thoughts in the afternoon than it is first thing in the morning or if I'm feeling slightly under the weather. Do those external environmental factors make their way into the analysis as well?

Dr. Adam Vogel: Yeah, absolutely. I also think better in the afternoon rather than the morning. It is 7:30 [00:19:30] in the morning for me, but I have been up for a few hours for some other meetings. But I'm going to use that as an excuse of why I may be a little bit disfluent today. Other features that do affect speech include tiredness, so that's actually a huge element of our own speech production. We can hear when our loved ones sound tired just by how they're saying sounds or how they're speaking. That becomes exacerbated [00:20:00] in some progressive neurological diseases where fatigue or sleepiness is a big feature.

Dr. Adam Vogel: Depression also plays a role in someone's speech production. If you think about a stereotypical individual with depression, their speech is actually slower, there's less variation in their pitch, and those features can be drawn out in someone's speech production. Tiredness and [00:20:30] depression are very common in progressive neurological diseases. Huntington's is one of those. And so if someone is designing a protocol for assessment in this space, they need to consider those as potential covariants in their analysis.

Dr. Adam Vogel: To get around that, we typically assess people at the same time each day. The batteries are very short, so you don't induce change just by the fact that you're getting them to perform a task. You think about some of the clinical exams that go on [00:21:00] in the clinic but also in clinical trials, they can go for hours, which is a really demanding process on a patient or an individual. So any battery should be as short as possible. Our speech batteries are five minutes long, so you don't induce change just by virtue of doing the assessment itself. So fatigue and depression are big features. There's some more subtle ones, things like hydration. So if someone is [00:21:30] thirsty, their vocal folds can change in their constitution, and that can affect the voice in very subtle ways, not so much in terms of influencing an outcome in an assessment, but just considering it as one of those features that need to be mitigated against when someone's designing a speech battery.

Kevin Gregory: That's interesting. Now, in terms of an assessment, walk us through a typical assessment. You said the battery is pretty short. [00:22:00] If I'm coming in for one of these, what would I typically... I'm having my own issues here.

Dr. Adam Vogel: It's contagious.

Kevin Gregory: What would I have to go through during one of these assessments?

Dr. Adam Vogel: Well, I think there's two ways of approaching it. We design our batteries specifically for things like a clinical trial where speech is being used as an outcome measure to test the efficacy of a particular drug. But we also [00:22:30] have clinical assessments in which we would do assessments in conjunction with the neurologist, for example. So to speak to that setting first, if we were assessing an individual in a clinical setting, we would record their speech. I mentioned the battery's relatively short. We'd get a sustained vowel and maybe some connected speech, which sounds like a monologue or just describing a story, but also some syllable repetition [00:23:00] tasks, which are quite sensitive in Huntington's disease to pathology.

Dr. Adam Vogel: I'd then also speak to communication partners. There are some formal questionnaires that you can ask individuals who are working or living with individuals with Huntington's disease. And then we have developed a dysarthria impact scale, which looks at... Dysarthria is the neuromuscular [00:23:30] speech disorder associated with Huntington's. We have a scale that looks at the impact of speech on an individual's daily life. It talks about things like whether or not employment is an issue, social relationships, any anxiety around the changes that are occurring because of the disease in relation to speech. And covering different aspects of the patient profile I think are really important in a clinical exam. So you're [00:24:00] going to cover things like the impairment, the actual speech changes that are occurring, and the impact of those changes on both the individual with Huntington's and their environment. So a clinical exam should cover every aspect of communication. You most likely pair that with a neuropsychological examination which will then focus on some aspects of language or the speech pathologist could do that. [00:24:30] And then the interaction with cognition as well, I think, is really important.

Dr. Adam Vogel: From a clinical-trial setting, the battery needs to be incredibly short. Those clinical trial batteries are usually very long overall for a patient, so we try to minimize those as much as possible. They just include those speech tasks which are recorded and those that I've mentioned, the sustained vowel, syllable repetition, picture description for example. The good thing about [00:25:00] speech is that you can record it and then do the analysis any time after that. So one issue with some clinical exams is that every task that is being elicited from the patient, the recordings are done then and there and you need lots of iterations or repetitions of that task to get a reliable measure. Speech is helpful because you just get someone to speak and then you can record it, and then you can conduct any number of analyses after the point. So [00:25:30] clinical trials, it's a very short battery. And if you are seeing a medic and their allied health team for a clinic setting, that needs to be conducted in a much more holistic approach.

Speaker 1: We'll return to the interview on the HD Insights Podcast in a moment. We hope that you're enjoying this episode. As a nonprofit organization, the Huntington [00:26:00] Study Group relies on the generous support from the community and listeners like you to continue bringing you in-depth content on HD like this

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[00:26:30] We greatly appreciate your support. And now back to our episode.

Kevin Gregory: Now, for the platform presentation that you did in Sacramento, what was the study? How many participants did you have in that particular study, and how long did it last? How many times did they have to come in for a visit?

Dr. Adam Vogel: So [00:27:00] we had two elements to the work that Jess Chan has been conducting over the last couple of years. One is looking at a single time point and comparing different disease stages for a bunch of individuals with Huntington's mutations, and another was looking at how stable those productions are over a six-month period. For that single time point for that prospective study, we had four groups depending on how you [00:27:30] want to split the cohort. But we had a presymptomatic group, and there's about 15 in that group, a prodromal group, so getting closer to reaching symptomatology. That has about 20 individuals. And then we had early and mid-symptomatic individuals. They had about 10 to 15 in each of those groups. They obviously differ by age, given that the disease progresses. Their burden of pathology [00:28:00] scores which were based on the genetic profile as well as their age varied because of their disease stage, again.

Dr. Adam Vogel: Within those four groups, we were interested in looking at how speech differs at a single time point. I think an ideal protocol is running a very long study following people from 20 years presymptomatology all the way up to becoming symptomatic. [00:28:30] But that's something that we could possibly pursue, but it's not something we have done in this particular study. I'm still relatively young, so I could follow these people for another 20 years, and let's see if we can capture that. But the second phase of the study is looking at how people's speech... how stable it is over a six-month period. And we just had a really small pilot study in that space looking at 10 individuals who were recorded five times in a [00:29:00] day, five times in a week, five times over a month, and then at three and six months. We wanted to see if speech production changed in any context over that period because it's important to know what is happening, how stable someone's speech is if you want to know how much is changing.

Dr. Adam Vogel: So just to go into that a little bit, if we are making assumptions about [00:29:30] someone's performance based on one assessment, you can appreciate that perhaps that's not representative of what's going on on a day-to-day basis. If you have more assessments occurring over a longer period of time, then we can say that that's actually representative of their function. If we test someone at time point A and then their speech changes at time point B, how do we know that that time point B is because of the intervention that we've introduced or is [00:30:00] it resulting from the fact that we've assessed them again or is it resulting from disease progression? So we need to know what stability looks like in the context of the disease in order to make judgements about the sensitivity

of an assessment. I think that's a really important aspect that's often missed in clinical exams in that we need to know what's not changing in order to make assumptions about what is changing.

Kevin Gregory: Now, [00:30:30] along those lines, too, I know in other clinical trials related to treatments, there's a lot of focus on more of a natural history study or longitudinal studies. Is there anything like that in place for speech, or is that something that's next steps for you?

Dr. Adam Vogel: It's an incredibly important aspect of any clinical research. We started to talk about this natural [00:31:00] history space while we're in Sacramento. I guess one of the issues with longitudinal assessment is that it's incredibly time demanding. But it's also incredibly necessary. So our work is focused on single time points. I mentioned that very small pilot study looking at stability over six months, but what we do need is something that's following people over a larger period of time.

Dr. Adam Vogel: Now, we've been building an assessment platform [00:31:30] that people can do in their home. This is a web-based assessment that we've been using in other populations to get as many people as possible to provide as many assessments as possible over time. I think what we're planning on doing is teaming up with our colleagues over at another university in Melbourne. Professor Julie Stout is a supporter of the work that we've been doing and working with her to [00:32:00] find a way of tapping into providing home-based assessments, which would require individuals carrying the Huntington's genetic variation to provide assessments as frequently as possible.

Dr. Adam Vogel: So people would click a link. Then they would record using whatever devices they have available to them, so we've been building this platform so it works on both mobile as well as computer-based [00:32:30] software. They would just run through a series of assessments which allow them to read a passage, say the sustained vowel, the syllable repetition, for example, and then maybe ask a couple of questions about how their speech is and how they feel. That consortia-based approach is entirely necessary for us to be able to actually answer some proper questions about speech in the context of Huntington's.

Kevin Gregory: Looking [00:33:00] back on your experience and all the research that you've been involved with, what's something that in the course of looking at it or researching it or studying it that you expected to find or to prove the assumptions you had, but something that turned out really to not be the case?

Dr. Adam Vogel: Yeah, it's nice to be able to think a little bit about some of the work that we've been doing over [00:33:30] the last decade or so. Well, when an individual is a long way from diagnosis, there is an assumption that there's not much going on from their speech. It's certainly not the impression from the majority of medics or even early clinical geneticists and early in the disease process who will meet an individual and provide [00:34:00] some counseling about what a diagnosis or

what a genetic profile might mean for the individual and their life going forward. There's no assumption that speech is changing in that context very early on.

Dr. Adam Vogel: What I was surprised to see in our data is that even from that relatively small sample size that I was describing, 15 to 20 in each of these groups, that there are very subtle changes in speech that are very [00:34:30] hard to hear for the listener. So I'm always an optimist. I think that the stuff that I'm doing is probably going to find something, but I'm also genuinely surprised when we do find these remarkable results that suggest that what we've been building towards is actually something that works in terms of being able to capture differences between different disease stages. So I guess that's comforting for us. We spend so much [00:35:00] time working in this space and having a PhD student who's been with me for five years now and her work actually turning out to be something that's telling us something we never knew before about the disease, I think that's been a real surprise and really a positive aspect of the process that we've been going through.

Dr. Adam Vogel: I just think there's also so much work to do. We don't really understand how speech is working within the brain, [00:35:30] how the changes in the neuropathology in Huntington's affect different aspects of speech. That's such a undiscovered space. Even how well speech interacts with different cognitive deficits, that needs more exploration. I think one of the new approaches that people have been adopting here in this space is the role that speech can offer in dual-task assessments, so dual [00:36:00] task meaning performing one task and then also doing another. I think that approach is going to be where some of the clinical assessments are going to continue but using objective measurements, like acoustic analysis. So there are some surprises, but I think there's so many unanswered questions there that there's another whole career for someone, or for many people, in this space to pursue.

Kevin Gregory: In terms of [00:36:30] continuing the research in this space, do you find that the field is in need of more people to have this specialty, to get in this area? Are there any particular suggestions or recommendations if people are interested in getting involved in this type of work or research that you would recommend to them?

Dr. Adam Vogel: Well, the new frontier in this space is using [00:37:00] AI-based-machine-learning statistical approaches to sorting through data. Obviously, you need a lot of data to be able to make the use of and exploit those technologies. One area that we're certainly focusing in on is that machine-learning work and utilizing data we've been collecting over the last 10 years to inform judgements in that space. That's definitely a place that people could [00:37:30] contribute from a speech point of view. There are only a small number of groups looking at speech in Huntington's across the world. There's a fantastic colleague of mine in the Czech Republic, Jan Bruce who's doing some great work in acoustic analysis and Huntington's. There was a new paper that came out in neurology last year from the Huntington's group at Vanderbilt. We've got some colleagues in

Germany [00:38:00] who've been working in this space on and off over the last five or six years looking at presymptomatic Huntington's as well as symptomatic individuals. And then there's another group in New Zealand who are looking at the swallowing function in Huntington's disease, which I think is another under-researched space apart from a group in the Netherlands who've been doing that work for quite a while.

Dr. Adam Vogel: There's not much research [00:38:30] in there where I think the community could definitely benefit from a critical mass of individuals pushing the field forward. One area that's really not well developed is therapeutic interventions for both speech and swallowing in Huntington's. Behavioral therapies like that are very hard. They're hard to develop. They're also hard to test, and they take a long time to evaluate. So if [00:39:00] we can have more people join that space, I think that's definitely an area where I prefer exploiting from a scientific point of view.

Kevin Gregory: Well, hopefully this is a first step in helping to get that call out to people to join the cause. Dr. Vogel, this has been fantastic. I do want to ask you one last question, though, and that's out of everything that you've done, what do you consider to be your [00:39:30] proudest professional accomplishment.

Dr. Adam Vogel: Well, I'd love to say it was related to Huntington's disease, but I think it's more focused on one of my other progressive neurological disease groups, and that's in ataxia. For the last eight years, we've been building a speech treatment tool which is based on biofeedback. I think it's likely appropriate for Huntington's, and so we'll definitely be trying to [00:40:00] roll it out in the next couple years in the Huntington's space. But we've made a home-based therapy that actually improves people's speech when they've got a progressive neurological disease. There was this prevailing wisdom in [inaudible 00:40:16] that it's very hard to effect change in individuals with a neurodegenerative disorder because they're on a downward decline. I never really adopted that. I mentioned that I'm an optimist. [00:40:30] I always felt that we could actually improve people's function despite the progressive nature of these diseases. The therapy that we've been developing in the ataxia space has proven to be effective, so people's speech is actually improving with an intensive therapy that you can do in the home.

Dr. Adam Vogel: So I think that's also important. Something that you have to go into the clinic certainly in this current environment where you're not allowed out of your house is not really feasible. If you could do something in your home that provides you [00:41:00] feedback directly and live, I think that's really valuable. So a therapy that improves people's lives by improving their speech is something that I've been really proud of. I hope to be able to do something similar in the Huntington's space, but you'll have to watch it and see where we go with that.

Kevin Gregory: Well, I think we definitely have the right person working on it, so I want to thank you for all the work that you've done and the research that you and your team have done. Thank you, again, so much [00:41:30] for joining us on this episode, Dr. Vogel.

Dr. Adam Vogel: Thanks, Kevin.

Kevin Gregory: Many thanks, again, to Dr. Adam Vogel for help making the 15-hour time difference between our two locations work. I hope you enjoyed learning a little more about this line of research and that we could help provide some respite from the social distancing lifestyle so many of us are dealing with currently. There's a lot of amazing work being done in HD. If you're one of those people, a researcher, [00:42:00] an advocate, a provider, and have an interesting story to share, or if you know someone we should profile in a future episode, feel free to reach out to me at kevin.gregory@hsglimited.org. In the meantime, don't forget to subscribe to the HD Insights Podcast on your device to make sure you automatically get our newest episodes. So until next time on the HD Insights Podcast, I'm Kevin Gregory. Thank you for spending your time with us. Stay safe. Be well. Look out for [00:42:30] each other. And we look forward to bringing you our next episode.

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