

14| Neuropsychology for Non-Neuropsychologists (Part 2)

February 15, 2019



This is an audio transcription of an episode on the Navigating Neuropsychology podcast. Visit www.NavNeuro.com for the show notes or to listen to the audio. It is also available on the following platforms:



Speakers: Dave Fletcher, John Bellone, Ryan Van Patten



Intro Music 00:00



John Bellone 00:17

Welcome, everyone, to Navigating Neuropsychology: A voyage into the depths of the brain and behavior. I'm John Bellone...

Ryan Van Patten 00:22



...and I'm Ryan Van Patten. Today we're having a conversation with someone outside the field of neuropsychology in order to answer some common questions that often come up when we tell people what we do for a living. We tried to give as broad of an overview as we could in episode 2 - we were balancing being thorough with also keeping people's attention and not giving overly detailed information or making the episode too long. So we wanted to run that episode by someone who is not in our field, in order to check on whether anything was unclear or if there are any follow-up questions.

John Bellone 00:57



We chose my uncle, actually, Dave Fletcher, he's my dad's sister's husband, because he is smart, easy to talk to, has nothing to do with the field - he is in network engineering -and, most importantly, he's very curious and asks great questions. So we chose not to go into all the depth that we could have. This is kind of like a feedback session or a Thanksgiving dinner kind of conversation where we're just giving broad answers. The purpose is really for those of you neuropsychologists out there to maybe share this with others who are not part of the field who want to learn more, or maybe for students to gain a little more of an understanding of some of these topics.

Ryan Van Patten 01:41



Our conversation does center more around adults and older adults rather than children. Because, first, that's what John's uncle was more interested in, and also, it's more within our wheelhouse for John and me. We might do more of these episodes, if listeners give us feedback that they're enjoying it and if there are more questions to answer. We will say right up front that, of course, we're not experts in every topic, but we answer based on our understanding of the current state of empirical knowledge in the field. So if you're a listener who is not in the field of neuropsychology, I think it would be helpful for you to listen to episode 2, Neuropsychology for Non-neuropsychologists, before you listen to this. So you can go to navneuro.com/02 for a direct link to that episode. And now we give you our Q&A with Dave Fletcher.



Transition Music 02:36



Ryan Van Patten 02:45

Okay, and now we're here with Dave Fletcher. Dave, thanks for coming on the podcast.

Dave Fletcher 02:50



Yeah, thanks, guys. I just want to say I really enjoyed podcast #2, you know, for newbies since this is not my field or forte. It was awesome because, as we'll talk about and hopefully later in the podcast you'll answer some questions, I do have a parent that I think is starting to suffer from memory challenges. So appreciate your time.



Ryan Van Patten 03:12

Yeah, thanks. We appreciate the positive feedback and sorry to hear about your parent. So take it away, Dave, ask us whatever's on your mind.

Dave Fletcher 03:22



So I put together a list of questions as I was listening to the podcast. First one is: In your example of interviewing a patient for the first time you focused on memory. What are other examples that someone might seek your help?



Ryan Van Patten 03:36

Great question. Memory is only one of several cognitive abilities that we often test. Other examples are attention, processing speed - the rapidity with which someone takes in information - language functioning, visual spatial functioning - or someone's skills with regard to taking in and reasoning with visual information, mental manipulation, things like that - memory, as you mentioned, and executive functioning - which is a technical term for high level thinking skills, things like planning, reasoning, organizing information, solving problems, shifting between different sets, as we like to say, so multiple different cognitive skills. We had focused on memory because that's more of our area, but depending on the problem that the patient comes to see us with we might focus on a different area. So, for example, if we were to see a patient who has ADHD, attention-deficit/hyperactivity disorder, then we would be more likely to focus our questions and then our tests on their attention, rather than memory. We like to be broad and test all those skills, but we might focus on one area or another. We might focus on language for certain people, executive functions for certain people. Yeah, it really just depends.

John Bellone 05:08



Yeah, Ryan and I are pretty biased because we work mostly with older adults, and short-term memory difficulties or forgetfulness is by far the most common symptom that we hear and often the main reason why people seek evaluation or why their doctor sends them to us in the first place. But, like Ryan said, there are lots of other reasons to see us. Just to add a bit more detail, you know, if someone had a stroke in a certain part of the brain, they might present primarily with language impairments, either difficulty expressing their thoughts or trouble understanding what others are saying. Someone with a traumatic brain injury from a car accident, let's say, or a fall, might now be more impulsive, might have difficulty regulating their emotions, solving problems, or they could have a completely different problem based on where in the brain the damage was. In addition to ADHD, like Ryan mentioned, parents also often bring their kids in because they're concerned about a learning disability, or autism, or seizures - lots of things. So, basically, anything that affects behavior and cognitive abilities can be a reason why someone might see a neuropsychologist.

Dave Fletcher 06:22



Oh, that's great info. Thanks. I guess I always thought that everything that we ultimately do, we had to remember. Such as, you know, my brain is telling me to raise my right hand if I have a question. Did I already need to know how to do that? Or is it something that I just learned along the way of life?

Ryan Van Patten 06:42



Right, it sounds like you're getting at a different kind of memory, what we would sometimes call implicit memory. I'll briefly go over these two different kinds of memory that researchers have found in the brain. The type of memory that we usually think of is called declarative or explicit. That's like, "I remember a fact or an event that happened to me", like I remember what I had for breakfast this morning. The way that type of memory is processed in the brain is actually distinct from how implicit memory is processed. So your question is about remembering how to raise your hand - other examples might be remembering how to drive your car, or how to play pool or another sport, right? Something you've practiced and involves sort of muscle memory, as people might say, or a rote motor behavior. We call that implicit memory, because we can't and we don't verbalize it so much, right? Like, I can't tell you how to play pool so much as you can practice and get better. I can give you some instructions, but mostly it's a sort of ingrained skill that you learn through practice. And so I think, to your point about remembering how to raise your hand, that's referring more to the implicit memory system.



John Bellone 08:04

There's actually been some really cool studies showing that people can have almost no ability to learn new declarative information, but they still managed to learn some of this implicit, or sometimes it's called procedural, types of activities.



Ryan Van Patten 08:21

Yeah.



Dave Fletcher 08:23

Good. Thank you. Next question is how does the brain become damaged just by what you see, such as your PTSD example in our military?



Ryan Van Patten 08:32

Right. So PTSD is a really interesting example. For people who have PTSD, it can definitely impact their thinking and memory. How this works is that the severe trauma that people experience, such as combat exposure or sexual assault that ultimately leads to PTSD, impacts the brain's stress systems. So the most prominent brain network here that we tend to think about is called the HPA axis. The technical term for that is a mouthful - the hypothalamus-pituitary-adrenal axis - so we're going to stick with the HPA axis.



John Bellone 09:13

[laughs]



Ryan Van Patten 09:13

It's one of the brain's primary stress systems. When someone experiences severe trauma leading to PTSD, that system is dysregulated such that the person is constantly or frequently in this hypervigilant, hyperactive state where the stress system is overactive. Although we know those systems are helpful and adaptive for us to have - the classic example is the caveman running away from a saber-toothed tiger or something like that, right? You need these resources to be pulled together quickly to respond to a threat in the environment, think about the soldier in combat. But, if you have PTSD, that system is always active and it's placing a drain on the resources that your body and brain have. Cortisol is the hormone that people often associate with the HPA axis. A lot of cortisol being released for a long period of time can have detrimental effects on the brain. There are receptors for cortisol in an area of the brain called the hippocampus, which is really important for memory. So

long-term exposure to cortisol can cause some negative impacts in memory and thinking.

John Bellone 10:35

Right. Ryan mentioned the hippocampus and I'll mention an interesting anecdote one of my professors told me on how to remember that the hippocampus is associated with memory - if you saw a hippo on campus, you would definitely remember that happened. Just a fun way to remember the word because it is a very commonly used part of the brain.



But, you know, one other way that PTSD can affect memory, is by reducing your ability to pay attention. So the way I like to think about it is that we only have a limited amount of energy that we can use to stay focused. If some of that attention is used up by thinking about the traumatic events that happened, or worrying about one's safety or about where the nearest exit is, you're not going to be able to focus on the name of the person that you were just introduced to or what your wife told you about your weekend plans. It might look like a memory problem but, really, it's an attention problem because you would not be able to remember something that you're not paying attention to in the first place. And poor sleep, irritability, depressive symptoms, substance use, family stressors, all of these commonly occur with PTSD. They can also impact our cognitive abilities, and especially memory. Eventually we're going to devote an episode to the cognitive effects of PTSD, but that's kind of a quick overview.

Dave Fletcher 12:08

Well, you said sleep and it's interesting, everything I read today about trying to stay healthy as you get older - number one thing, get some rest. Sleep. Get your 7 or 8 hours, whatever it is.



Ryan, you mentioned stress a couple of times. Is stress on the brain from a traumatic thing any different than stress that we put on our day-to-day lives, which isn't good for us either?

Ryan Van Patten 12:31



Yeah, they are similar but different. So daily stress also has negative effects. One primary way that day-to-day stress can have negative effects, going off of what you said a moment ago, is it disrupts our sleep. And that, as you said, negatively impacts our thinking and memory. But the stress that people experience when they have PTSD is just at a whole other level. It's like daily stress times 1000, and

they're constantly in it. Think about when you're really stressed and you may even feel some physical signs, like your heart's racing, your muscles are a little tense. Maybe for a lot of people before they give a talk, like a public speech, or other situations, like family stress or things like that, you really feel it in your body, right? People with PTSD are feeling that constantly or frequently, like on a daily basis, even if there's not necessarily a cause for it. It can get worse if they have a trigger, something that reminds them of the tragic event. But generally that stress system is in hyperactive mode and there's an onslaught of stress for them.

John Bellone 13:44



But it is also not super healthy for someone without PTSD to have that engine constantly kind of revved up. That cortisol pumping through a little bit is fine and can be adaptive actually. It could be a good thing. Like Ryan mentioned, if you're going to give a talk that anxiety helps you prepare better, and it could be adaptive to some extent. But when that's not able to be turned off or it's too high of a level it really starts doing damage.

Ryan Van Patten 14:14



I'd like to say one other thing about sleep. Again, I'm glad you mentioned that. There's some recent evidence that when we sleep at night, especially when we're in the deeper stages of sleep, one good function of that is that it's clearing away some of the proteins, the stuff we don't want in our brain that can lead to Alzheimer's disease. This isn't 100% for certain, but there's good evidence suggesting that. So more sleep could help stave off Alzheimer's disease. Whereas people who have poor sleep tend to have more accumulation of amyloid beta, that protein that likely contributes to eventual Alzheimer's disease.

John Bellone 15:00



Yeah, I like to think of sleep, exercise, and diet as kind of like a three-legged stool, and if one of those isn't good then it's going to topple over the whole system. And you know, if you have two that aren't good, if you're not exercising and you're not getting poor sleep, then even if you have a good diet, it's not going to be able to make up for the fact. So all three of those are really important. But yeah, sleep is extra important for just overall cognitive abilities and general health.

Dave Fletcher 15:28



Yeah, yeah, good info. Thank you. Let's see. So I forget stuff all the time, but later I remember that I have forgotten or what I have forgotten. My mom is forgetting

things and has no recollection of what she was supposed to do or even remember. What's the difference? And, generally, what's the cause?

John Bellone 15:47



Yeah, it's really good to make the distinction between normal versus abnormal forgetfulness. Some amount of memory lapses are normal for everyone, no matter how old or how intelligent you are - it's just part of being human. We all lose our keys sometimes, or can't find our car in a crowded parking lot, can't remember someone's name. Some degree of decline, or increased forgetfulness, is also normal as we get older. So a 70 year old just isn't going to have the memory ability that they had at 30, it's just a given. Usually the cause for these normal problems is a lack of attention, rather than a pure memory issue. So similar to what I just explained with PTSD, you might not have been really paying attention to what your wife said about your plans, right?



Dave Fletcher 16:43
[laughs]

John Bellone 16:44



So, of course, you're not going to remember it if you're not paying attention. It's also possible that a hearing problem could get in the way because if you don't hear, again, what your wife says, you're not going to remember it. There's also selective hearing, right? [laughs] When you're really not interested in what's being said, which everyone who's married can attest to. I'm going to get myself in trouble here. [laughs]



Ryan Van Patten 17:07
Keep going, please. Keep digging your own grave. I'm enjoying this.

John Bellone 17:10



This never happens with my wife. [laughs] But you know, these aren't necessarily the types of problems that we should be worried about. Really, it becomes a problem when you start forgetting things much more often than you used to, or you're forgetting things more often than would even be normal for your age. Or if it starts impacting your everyday activities - you're forgetting to take your medicine more often or forgetting to pay bills, things like that. If the information typically comes back to you after a minute or so, that's a good sign. It's less likely that it's due to damage or disease, and more of just that benign normal forgetfulness. So I

tell people, though, that they can always ask their primary care provider for a neuropsych eval in order to be sure that it's not abnormal, because it's hard to parse that out on your own.

Ryan Van Patten 18:09



Yeah, that's all helpful info, John. I'll just add a few examples of potentially concerning memory problems. So people who forget the names of others that they've known for many years - like, if your family member has a friend who they've known for decades, they've always known their name, and then they start forgetting the name, that would be concerning. Another example would be someone who forgets major recent events. So say this person watched a movie last night and not only do they don't remember the details, they don't even remember the gist or maybe they don't even remember that they watched a movie at all - that would be concerning. It's helpful to have a bit of an understanding as to the types of memory problems that are consistent with what John mentioned, like benign forgetfulness as we age that happens to everyone versus some of these more concerning memory problems that could be harbingers - they could be red flags for a potential major memory decline.

Dave Fletcher 19:20

Wow, interesting. Okay. And that makes sense, by the way.



So you talk about the speed at which you can recall things, some people don't process things as fast as others. How do you know if they have some sort of brain damage or simply function a little bit slower? I know people that are, you know, we say "quick-witted", but not just quick-witted, they can just respond quickly. Where others that are just as "intelligent", take a little bit longer to get their answers out. What's the difference?

John Bellone 19:52



That's a good question. You're absolutely right that everyone has different abilities. Some people can think quicker than others just at their baseline - they're just lucky. And this applies to all cognitive skills, there's going to be some variability among people. Our tests measure how far outside of normal someone is. So that if they're too far from average - you know, we've given these tests to hundreds or sometimes even thousands of people, and we know what the average is for that population. Let's say you're too far from that average, you score on a test is in the fifth percentile, well then we can say with a fair amount of certainty that it's likely not due to chance, meaning that it's most likely due to some kind of brain damage or some

other cause than just the normal variability. Now, there's some exceptions to that. We like to give lots of tests, because we want to see if patterns emerge. We don't just rely heavily on one measure because that might be artificially off or low. We take into account lots of other factors that could potentially explain poor scores that don't have to do with brain damage - like someone's baseline intellectual ability, like you alluded to, their educational level, whether someone has signs of depression or hasn't been sleeping well - you know, if they didn't get any sleep the night before, they might not do as well in our tests - and there are a hundred other things that we have to, as neuropsychologists, sort through and figure out.

Ryan Van Patten 21:30



Yeah, and I'll just add to what John said about how a neuropsychologist interprets an assessment. So, even if someone is completely cognitively healthy, we often don't know and that's what we're often being asked. "Is this person cognitively healthy or not?" But imagine that we know they are completely healthy. Those people, if you test them enough, will have some bad scores. They'll even have some scores that we call impaired. It's just, again, if you give someone enough tests, they'll score average on some, good on some, and they'll score poorly on some. So we take that into account. If I were to give you 30 tests and on a few of them you scored below average, that likely would not be concerning, that would actually be expected. So we always take that into account. And that can be helpful for people who may be undergoing testing, right? For someone who's getting ready to complete a cognitive evaluation, it's very anxiety provoking, unfortunately. We try to mitigate and reduce that anxiety as much as possible, but they may feel like they did poorly or they may have even done poorly on a test. But that one test does not mean that they have a disease necessarily or that there's really a cognitive deficit.

Dave Fletcher 22:54



Well, you bring up a good point about anxiety. I'm sure you've heard of the - I may get this wrong - the white coat syndrome, when you're going in to have your blood pressure checked, it's always higher.



John Bellone 23:03

Yep.



Ryan Van Patten 23:03

Yep.

Dave Fletcher 23:03



So yeah. How do you - so I guess a follow up question would be, how do you bring someone to a calming state, if you will, as you're putting them through the tests and the exercise?

Ryan Van Patten 23:19



Great question. We spend a lot of time learning how to do this as best as we can. Of course, if someone is having a panic attack at the start of testing, sometimes there's nothing you can do. That's very, very rare. But, in extreme cases, we would just not test them if their anxiety was so overwhelming, if it was at panic level. However, what's much more common is that people have performance anxiety, the white coat syndrome, as you mentioned. We do our very best over a lot of time and through a lot of experiences working with patients to be both precise and standardized as we administer our tests, but also to be as warm and calming as we can. To talk through the nature of the testing with the person, to just try not to make them any more anxious than they already are. There's a lot of things we can tell them that for a lot of people make them feel a bit better, like what I was speaking about a moment ago. That everyone does badly on some tests. The whole purpose of this assessment is just to help you. I'm not judging you in any way. I want to do my job and hopefully you can get through this and feel as best as you can. If you need to take a break, to use the restroom, or take a walk, that's fine. We use a lot of comforting language around that to try to help people score as well as they can.

John Bellone 24:50



Yeah, and the benefit that we have is time. So it's not like another physician, like your primary care doctor where you might get in there and they only have 15 minutes to talk to you or get all the information from you. We spend hours with people. Most neuropsychologists do the interview first, the vast majority I'd say, and so we have an hour or more before we even start the testing to build that rapport with the person, to really dive into their difficulties and their life. We all have a background in general psychology, and most of us are trained as therapists to begin with, so most of us are, I like to think, pretty warm and like a personable presence and really try to work with the person's strengths. And yeah, most people even if they come in expressing that they're stressed out, usually by the time we start testing that's kind of gone away, I've noticed.



Ryan Van Patten 25:50

Agreed.



John Bellone 25:51

Yeah.

Dave Fletcher 25:53



Okay, very good. Before I ask this next question, if I misunderstood something please point that out because it's a longer question and I thought I understood what you were saying but if I didn't please say so. You said neuropsychology is the study of brain-behavior, and there's an expectation that everyone's brain is supposed to behave the same way. If this is true, why are some people able to think beyond what someone else may never comprehend? I guess why I'm asking this is, is there a difference between how you process something and how intelligent you are?

John Bellone 26:30



So neuropsychology is broadly the study of the brain and behavior. So really how the brain produces the behavior that we see, and how to tell what's going on in the brain when behavior is "abnormal". By behavior, we mean all of our thinking skills - our memory, attention, language, all the things that Ryan laid out, and also emotions, physical functioning, and to some extent, our actions. So everything that we are and that we do is really controlled by the few pounds of jelly between our ears. I mean, it's responsible for all the behavior that we see. But to get to your question specifically - of course we are all different. Like we talked about in response to your last question, we have different likes and dislikes, different personalities, we behave differently, which suggests that we have some differences in our brain cells, or in the wiring between the cells, or the chemistry, or the electrical impulses, this all leads to different ability levels. And yes, of course, one's intelligence level - which, by the way, is a very vague and elusive concept that we can spend a lot of time talking about - but one's general intellectual ability can affect how they process information. And so, we do take into account that people are going to perform differently to some degree. But similar to what I had said, we look at how far off from "normal" the person is on each test, and then look for patterns taking into account their medical, psychiatric history, and a lot of other things to try to understand the full person.

Ryan Van Patten 28:25



I'll expand a little bit on the idea of intelligence, although, of course, we could have a discussion about this for hours. I think the term intelligence is often used, but often misunderstood as well. So the way that I like to think about intelligence is through this acronym that a researcher named Robert Sternberg posited years ago called MAMBIT. And MAMBIT stands for "mental abilities measured by intelligence

tests". So that is one way to think about intelligence. That suggests that someone's intelligence, what their IQ is, is what we measure with the tests that we give. And that is a much more narrow conceptualization of intelligence than a lot of people give it. So MAMBIT, mental abilities measured by intelligence tests, is a very useful skill and ability. In this way, intelligence, or IQ, does have some predictive usefulness in terms of someone's educational achievement, their occupational attainment, how far they get in those regards, and it is meaningful. It plays a great role in certain diagnoses, like if someone has intellectual disability, that diagnosis is related to their IQ score. But it's also limited. There are things that are not captured by MAMBIT. Things that are not captured by MAMBIT are things like creativity, rationality, conscientiousness, and a lot of very important skills that relate strongly to how successful we are in our lives. But when people say, "Such-and-Such is very intelligent, they're very smart," I think they often use that word to mean a lot more than I think about it. So, I'm thinking about this narrow, "Oh, it's what we measure with our tests". But if we say how smart someone is, we might mean: how successful they are in their lives, how well their emotional intelligence is, how well they function in relationships with other people. I think it's helpful to keep intelligence a little bit more limited, and then think about those other skills because they're important as well.



John Bellone 31:00

Does that answer your question?



Dave Fletcher 31:03

Yeah, absolutely. Now I'm going to go look up all that MAMBIT stuff. It's great.



Ryan Van Patten 31:09

[laughs]



Dave Fletcher 31:09

Absolutely. Thank you. As you can see, I watched the podcast like three times and I formulated my questions in order as I'm listening, so you can probably see the order here.



John Bellone 31:20

We love it.

Dave Fletcher 31:20



This next one is about your schooling, your studies. So after getting your bachelor's degree, you went to graduate school for clinical psychology, if I got that right. Do you have to pick a specialty like neuropsychology or could you obtain a Ph.D. in clinical psychology? And, if so, how different would your clientele be?

Ryan Van Patten 31:39



Right. A great question. So John and I both have Ph.D.s in clinical psychology. Our training, they call it a "generalist model". So, the training is very broad initially. We're trained as clinical psychologists first, and then as we move along in our training we start to start to specialize. So we could, just like any clinical psychologist, we could have chosen to specialize in something other than neuropsychology. We might have specialized in trauma or substance use treatment. There are many, many different specialties within the field. If we had gone for a non-neuropsychology route, then it's likely, not certain, but it's very likely that we would be interventionists. In other words, we would focus primarily on delivering psychological treatments to people. This could be psychotherapy, as we usually think about it, but there's a lot of different psychological treatments that are very helpful and efficacious. That's what most non-neuropsychologists focus on, whereas most neuropsychologists focus on assessment as we've been talking about.

John Bellone 32:54



Yeah, just to color it a little bit more. So, yeah, at least in the US, we go to grad schools. Ryan mentioned that we each have Ph.D.s. We could have also gotten a Psy.D., which is a doctor of psychology in clinical psychology specifically. And those generalist skills that Ryan mentioned really are the general psychology theories and conceptualizations. We get that training in therapy and interventions, delivering interventions. Then many programs under the umbrella of clinical psychology allow you to select a specialty area, neuropsychology for many schools is one of them. Some neuropsychologists do still have therapy clients, they carry both a caseload of therapy and assessment. But, you know, like Ryan said, there are so many subfields of psychology that we could have pursued.

Ryan Van Patten 33:54



Yeah, I'll just add one quick addition. In addition to neuropsychologists doing therapy, a role that is becoming more prevalent in neuropsychology is cognitive rehabilitation, or cognitive training, where neuropsychologists are not just assessing and evaluating the problem and then providing recommendations but we're also more active in then helping people who have disorders of memory and thinking.

We're helping them to learn to cope with them better often through compensatory skills, like relying on abilities that are still intact and learning strategies to function in your daily life as well as possible even though you have a brain injury. So I think it's important to know neuropsychologists primarily do assessment but we can also do traditional psychotherapy and cognitive rehabilitation as well.



John Bellone 34:53

I'm glad you brought up the cog training, that's a big part as well. Yeah.



Dave Fletcher 34:56

Yeah, good to know. Thank you. All right, let's see if I was really paying attention here



Ryan Van Patten 35:01

[laughs]



Dave Fletcher 35:01

If I got this next one right as I formulated my question because it kind of threw me for a loop here. You gave an example of neuropsychology to occupational therapy. If the patient's cognitive skills have diminished, wouldn't that have a direct impact on their day-to-day living such as meal preparation and driving?



Ryan Van Patten 35:18

That's a great question. Yeah.



John Bellone 35:20

Yeah, it often does, and that's why we always ask detailed questions about the person's functioning, like their driving safety or meal preparation, ability to handle finances, stuff like that. And sometimes we specifically refer to occupational therapists. But cognitive decline doesn't always impact these functional skills. So sometimes the deficits are very subtle and sometimes the person is able to compensate for them - like taking more notes, having more structure to a medication regimen, something like that. There's a whole spectrum, from completely independent - you don't need any help with any activities - to completely dependent. And occupational therapy is just another discipline that we work with to really help us in that area.

Dave Fletcher 36:15



Okay, the big one here: So I don't think a month goes by that I don't have a conversation with somebody about Alzheimer's or Parkinson's or dementia or memory challenges, something. And, you know, listening to your podcast, there seems to be an overarching illness and then there's things underneath it. You know, one of my ushers at church has Parkinson's, we talk about it all the time. So you stated Alzheimer's and Parkinson's as two different things, but earlier in the podcast, I got the impression that Alzheimer's was the overarching name for the illness, but you typically would have dementia or Parkinson's or something else. If dementia is short-term memory issues, and Parkinson's is the inability to control movements such as shaking, what is Alzheimer's by itself?

Ryan Van Patten 37:06

You're right, this question comes up very frequently. It's understandable because there are a lot of terms and they seemingly mean similar, but somewhat different things. So we'll take a couple minutes to try to clarify this.



So, dementia, let's start there. That is the umbrella term, the descriptive term, the overarching term, as you mentioned. So dementia is a label for a set of observable symptoms that include a decline in cognition. That declining cognition is noticed by the patient themselves and/or an acquaintance, someone who knows them well, often a spouse or a family member. And the decline in cognition is also documented through objective testing - this is neuropsychological or cognitive testing, as we've been talking about. In people with dementia, this change in their thinking skills is severe enough to cause decline in their activities of daily living, as we call them - things such as managing medications, driving, handling finances, the same things that you asked about in your last question, Dave. So those are the primary criteria for dementia.

There are many different causes of dementia. Alzheimer's disease is the most common cause of dementia. So if all you know is that someone has dementia, then the most likely cause is Alzheimer's disease. But there are other causes, too. Parkinson's disease, as you had mentioned, can cause dementia. There are different estimates in terms of the frequency of dementia in people with Parkinson's disease. Often people will quote that one third of people with Parkinson's disease have dementia. But again, it's important to know that there are different ways that someone can eventually have dementia. Another common cause is blood vessel or vascular dementia.

So a way to think about the difference here is that the dementia part is the observable clinical syndrome. That is what we can observe and measure through cognitive testing. We can ask them questions and find out that their memory is poor. Alzheimer's disease is a biological process that's going on underneath the hood, so to speak - it's going on in the brain. So, I can't look at someone from the outside and know what's going on in their brain. Of course, I can ask them questions about their memory and thinking, but to get at Alzheimer's disease, we use different medical and neurological techniques. Things like neuroimaging, such as a brain MRI, or sometimes we'll use spinal taps to get at cerebral spinal fluid, which can show some of the proteins that cause Alzheimer's disease. So it's important to make that distinction between what we can see on the outside, dementia, and what's going on inside, in the brain itself, the disease of Alzheimer's.

John Bellone 40:26

Just to reiterate, because, like you said, this is so often misunderstood and understandably so, it's complicated. So there's dementia, which I like to think of as the level of severity of cognitive decline and difficulties with everyday activities. So that's one thing. And then there's what's causing that dementia, which can be Alzheimer's or Parkinson's or dozens of other things, like Ryan laid out. So it's really important to understand that those are separate entities. So you have the degree of severity, and then you have the cause. It's also important to know that people can have the Alzheimer's disease proteins - the amyloid, the tau, they're often referred to as plaques and tangles - they can have that in their brain without showing any observable symptoms, like memory problems. It's thought that when those accumulate, when they reach a critical level, when certain other conditions are met, then we start seeing those outward signs. This is a simplified version, but hopefully that helps clear things up a little bit.



Ryan Van Patten 41:35

Any follow ups?



Dave Fletcher 41:36

Let me make sure, see if I got this. So Parkinson's would be an example of something visual, you can see that the person has some challenges with controlling their body movement, but yet they're fully aware of what's going on. Would that be, when you said, observing what's going on on the outside versus what's happening on the inside?



Ryan Van Patten 41:57



Right. I think about Parkinson's disease as being similar to Alzheimer's disease, but different. So Parkinson's disease is characterized by certain pathology, certain proteins that are accumulating in the brain that shouldn't be there and that cause symptoms. So there's Parkinson's disease, just like Alzheimer's disease, going on in the brain. And then what's happening in the brain causes the symptoms that express themselves in different ways. So if someone has Alzheimer's disease, the symptoms that we tend to see are memory loss, sometimes changes to their behavior, other changes to their thinking, like trouble with problem solving, things like that. Those are some of the early signs of Alzheimer's disease. If someone has Parkinson's disease, there's a different brain process going on under the hood. And because it's different from Alzheimer's disease, we see different symptoms first, and you mentioned a few of them. The symptoms we usually measure first in Parkinson's disease are motor symptoms. So these are rigidity and shaking, a tremor, the person often doesn't walk normally, we say they have poor gait, and they have slowed movements. Later, a person with Parkinson's disease can also develop problems with memory and thinking. But each of these different diseases - Alzheimer's disease, Parkinson's disease, vascular disease - have different symptoms that are expressed first, that we can see when we interact with the person.

Dave Fletcher 43:42



Yeah, that makes sense. Thank you. Okay, I've got - do we have time for a few more?



Ryan Van Patten 43:48

Yeah.



John Bellone 43:48

Sure.

Dave Fletcher 43:50



All right. So, let's see. I've noticed that sometimes people can remember things that happened a long time ago, like details from their wedding day or their experience in Vietnam, but then they forget something you just told them or forgot their grandchild's name. Why does this happen?

Ryan Van Patten 44:07



That's another excellent question that we get a lot. It seems a bit counterintuitive at first, but it's really based on how our brain works - how the brain takes in and stores and retrieves information. The technical term for what you described is called temporally graded memory loss. It refers to the fact that more recent memories that we have, such as what I had for breakfast this morning or a conversation I had a week ago, are still being processed and stored in the brain. So those memories are actually more vulnerable to the effects of brain damage. Whereas, in contrast, a more remote memory, you mentioned someone's wedding day or a significant event that happened to someone in their childhood, those memories are more stable in our brains. They've been cemented, really, over time in what we call the neural networks that operate in our brains, that lead to our ability to recall a memory. So, as you said, someone who has Alzheimer's disease, say an 85 year old with dementia caused by Alzheimer's disease, they're more likely to remember significant events from decades ago than they are to remember what movie they watched last night.

John Bellone 45:28



Uncle Dave, you remember that hippocampus that we talked about earlier? I'll test you right now. You remember what that was associated with?

Dave Fletcher 45:39



No, I'm going to be guessing and say the difference between where the long-term and the short-term memory is but...

John Bellone 45:43



Yeah. So, what I was getting at is the hippo on the campus, right? So that's involved in consolidating or forming new memories. Once it gets processed by the hippocampus, it gets sent or distributed to other parts of the brain. Those are the neural networks, the net of brain cells that Ryan had mentioned. The hippocampus, it's kind of like ground zero for Alzheimer's disease, so it gets hit first. So the memories that make it in when the hippocampus was still healthy, those stay in. For a lot longer, at least. Eventually those can degrade, but they get cemented, like Ryan said. But it's much harder for new memories to get in because that hippocampus is like the gatekeeper for new memories, and it's damaged. Those old memories, they also - another reason is that they had decades of being recalled and we know that repetition is very important. So they've been rehearsed over and over again, those memories. They're also usually more emotionally-charged

memories, like someone's wedding day or their time in Vietnam, and we know that emotion helps lay down new memories as well.



Dave Fletcher 47:05

So the hippocampus is not repairable once it starts to degrade?



John Bellone 47:10

That's a tough question. There are new brain cells that continue to be born and get integrated into the system throughout the lifespan. We used to think that you couldn't make any changes to the brain after we finished developing as kids, and now we know that's not true. That new brain cells are being born, new cells wire up with other cells. It does decrease as we get older - how quickly new cells are born, and generally how plastic the brain is, how moldable and shapeable it is. But it never stops entirely. Even if someone has Alzheimer's disease, there is still some neuroplasticity - some of that molding or shaping that can happen. But yes, it is decreased significantly. It is harder to change it.



Ryan Van Patten 48:08

Yeah, and right now we can't fully heal someone who has Alzheimer's disease, for example. Even though new neurons are born, they're born only in two places in the brain that we know of - the hippocampus and then the olfactory cortex, for smell. But even though that's happening, it's not like the memories that are being lost are then - it's not like the new cells are then recovering them. So when someone has severe brain disease, like Alzheimer's disease, or say they have a severe traumatic brain injury or a stroke, we can use neuroplasticity to help them regain a little bit of their functioning and help them to maximize what they do have, but they're never going to recover back to where they were before that happened. At least not now with the current technology we have, and probably not for decades.



John Bellone 49:05

Yeah. There is a lot of research going on to try to figure out how to reverse some of the problems or to prevent them in the first place. Thus far, those studies have not been successful. But there's a lot of research going on right now to help that. There is a Nobel Prize in it for any students out there who are listening to this and want to make a big impact. You know, hopefully we'll have a good treatment soon or a way to really prevent it other than the lifestyle factors.



Ryan Van Patten 49:43

Prevent Alzheimer's disease, you mean?



John Bellone 49:44

Yeah, exactly.



Ryan Van Patten 49:45

Yeah.



John Bellone 49:45

And, in general, like hippocampal shrinkage and things like that.



Ryan Van Patten 49:50

Yeah.



Dave Fletcher 49:51

Well, so, Ryan, your comment led me to believe that you can kind of relearn. It would be a lot of work, but you'll never get it back to where it was.



Ryan Van Patten 50:00

Right, that's true. It depends on what brain disorder or disease we're talking about. We often make a distinction between a degenerative process, like Alzheimer's disease, and what we mean by that is that the person is continually getting worse across time. It's slow at first, but day after day, month after month, the disease is causing their brain to shrink more and more across time. So there are these degenerative diseases and processes, and then we compare that to a single insult. So I have a family member who had a severe traumatic brain injury, and he is now head injured and will be head injured for the rest of his life. In that case, the brain experiences trauma and it's badly damaged, but the person does not continue to decline. They don't have a degenerative disease - they don't have a downhill slope due to that injury. It's a one time hit. So for people who have a degenerative process, using rehabilitation or cognitive training to make them better is even harder, because we're continually fighting uphill against this disease that is bearing down on them and continuing to make them decline. In comparison, people with traumatic brain injuries or strokes or other single insults like that, although they can lose a lot of brain functioning initially, their brains naturally recover to some extent - not back to where they were - but they recover a bit. We can work with them from that flat baseline to try to bring them up as much as possible. Often we're using

compensatory strategies, rather than restorative strategies. But we do everything we can to bring them up as close as possible to where they were before the injury.

John Bellone 52:01



There's some data that suggests that no matter what the condition, some of these strategies could potentially help. Even for someone with Alzheimer's disease, there are some ways to get around some of these difficulties - not a perfect way, but there are ways. We should also say - this is going to add confusion, so I won't talk too much about this - but there are reversible causes of cognitive decline and dementia as well. But let's not go there right now.

Ryan Van Patten 52:31



Yeah, some things that can be treated medically through medications or other interventions could be reversible. What we've been talking about today - Alzheimer's disease, Parkinson's disease, a stroke - those are not reversible.

Dave Fletcher 52:44



Well, let's see if I've got this. So, my sister called me the other day asking about an entry that she had in her Rolodex and if I recognized the name because she didn't remember what it was. I said, "I don't recall that name, either." Later on that day, I'm talking to my mom, who I think is suffering from some memory challenges, and I happened to mention it and she knew what it was. A day later, she called me three times in a period of 30 minutes, and each time she called she says, "Oh, I can't remember why I called" and hung up. You know, she said, "I'll call you right back". And in those three times that she called and couldn't remember why she called she also asked me if the kids are back in college yet. And I said, "Yeah, Mom, their break is over. I told you that last time." So would this be the hippocampus thing going on? I'm not asking you to make an assessment, but on the surface, is that kind of what you're talking about?

Ryan Van Patten 53:36



Yeah, I think what you just described could be consistent with that temporarily graded memory deficit we mentioned earlier. So if your mom remembers the information from the Rolodex, maybe she remembers that because it's old information that was stored a long time ago. So that would be what John and I described - it's more cemented, she's recalled it many times, and so it's still resistant to any decline she's had. Whereas more recent events, like kids going back to college or the reason why she called you, those are very recent events in her brain, right? Those memories are more malleable and vulnerable, and she

doesn't hold on to those. I think that may be a reason why you're noticing that discrepancy.



John Bellone 54:28

We should say that, like you mentioned Uncle Dave, this is not an assessment of her and this is somewhat speculative.



Ryan Van Patten 54:35

Oh, yeah, of course.



John Bellone 54:36

I just wanted to say that, explicitly.



Dave Fletcher 54:39

Very good. Good info. Thank you. Just a couple more questions here.



John Bellone 54:43

These are great.



Dave Fletcher 54:44

Does anyone ever come in complaining of memory problems but when you do an assessment on them their tests show they're fine?



Ryan Van Patten 54:53

Yeah, that does happen fairly frequently. There are several possible reasons for this, so I'll just throw out a couple. The cognitive tests that neuropsychologists use are very good. They provide objective information about how someone's memory and thinking are functioning. But, our tests are not perfect, just like no other medical tests are perfect. And so, sometimes, people can have memory problems, or trouble with attention or language or other cognitive skills, that are not picked up by our tests. Maybe their problems are too subtle, or they're able to compensate for them. There are a variety of reasons why we might not pick up on them.

Another reason why that might happen is, when we test people, we do so in a very controlled environment. We do this on purpose - we bring people into a quiet room, close the door, we try to minimize any distractions, we want people to be rested, and not otherwise preoccupied. We do this so that we can get their best performance and then compare them to other people who are similar to them from

a demographic perspective, and then we can know how they're functioning. But, as we know, in the real world, we're not protected from distractions, right? So in their home, they may have a lot of noise, the phone might be ringing, people might be yelling at them or calling their name. And so then they might start to notice these slips, these memory slips, or trouble focusing that we didn't pick up on testing just because there's so many distractions going on in their daily life.

John Bellone 56:33

More often is the case, like I said earlier about attention and PTSD, that when they're at home, they've got the TV on, dogs barking, they're responding to a text message. If their wife has asked them to turn off the stove in 30 minutes, you know, and then they get concerned that the potatoes burn because they forgot to turn off the stove. Their wife thinks that they've got Alzheimer's disease, when really it was just that they had too much going on - their attention was elsewhere. So that sometimes happens.



Another reason that someone might notice problems at home, but then we say that the tests look normal is because they're not accounting for those typical declines that happen as we get older. I find this to be especially true with very intelligent, high-achieving people. They might have been able to keep track of the names of 100 different employees and never struggled to find a word that they wanted to use before. But now, they sometimes forget the name of a distant cousin, or they have some word finding trouble once in a while, and it's scary for them. When we look at how they do on the test compared to others, they might be average or even high average, but, for them, it might be a true decline, right? They might have gone from being superior, and now they're just average. It might just be normal aging. So there could be a number of different things. I like to tell these people that, you know, it's not in vain. It's not like we wasted everyone's time by doing the tests. It could have been different. We could have found something and so this is good news for them. It also establishes a baseline so if a year from now or two years from now they do think things are then getting worse or others are noticing changes, then we can have them back, we can repeat these tests, and now we have data from them that we can compare to. So it's a better point of comparison later on.

Dave Fletcher 58:44



Yeah, that's a good point. Unless you knew them personally, you don't know where they were before they came to you. So that's an excellent point. It's the baseline that you have to establish now versus where they were then.



Ryan Van Patten 58:58

Exactly. Right. When we don't have a baseline on someone, and, of course, we don't know them, what we do is we try to estimate what we call their premorbid functioning. That just means we're trying to get an estimate as to what was their peak level of cognitive functioning in the past. We do this by getting information like, "How far did you go in school?" Or, "What sort of job did you work?" There are also some certain tests that tend to be resistant to the effect of most types of brain damage, meaning that someone can have a good amount of brain damage and still perform at their best, at their maximum, on these tests. And so we give those to get a sense - it's just an estimate, but it's a pretty good sense as to this person's functioning. This person, who we didn't know before, we don't know what their cognition was like 10 years ago, it's how we best estimate what their maximum level of cognitive abilities were so that we can compare their scores on this evaluation to what we think their max was.



Dave Fletcher 1:00:08

Good. Thank you. This next one is a two part question. I've heard that sometimes people have a lot of problems with remembering things or have problems taking care of themselves, but they think that they're fine. They don't see a problem. Is this true? And, if so, how do you help them come to terms with their memory challenges? When people are telling them that they shouldn't be doing what they're doing because they're challenged with this new illness and they just can't come to terms with it?



Ryan Van Patten 1:00:42

Right. Yeah, that's another very common syndrome that we see and something that we notice that happens in a lot of our patients. So the technical term for this phenomenon is called anosognosia, and it essentially means that someone has a lack of awareness, or a lack of insight, into their own deficits, which is just around what your question asked. Anosognosia is pretty common in people with moderate to severe brain injuries - it can happen in Alzheimer's disease, or sometimes in Parkinson's disease, or in traumatic brain injury. Really, any disease or disorder that causes moderate to severe cognitive impairments can potentially lead to the syndrome. There are multiple theories about what exactly is going on in the brain to cause it. We're not 100% sure, and John and I won't get into all the nuance there. But what is very relevant to your question, Dave, is this can be very detrimental and even dangerous for patients. Because if they are declining cognitively, but they don't know it, they can't really tell any difference, then there are often a lot of safety concerns that come on board with that. So just offhand, someone's driving might be

impacted, but they don't think it is so they want to keep driving, in which case they could easily get into a car accident. In more severe cases, even something like cooking, like leaving the stove on, could be a concern - it might start a fire in the house. It can be really challenging to have discussions about this with patients because, if it's due to this severe brain damage, then there's no way we can convince them or ration through this, you know, like logic through this issue or explain it in a way that they understand it and they're like, "Oh, yeah, now I know I have a memory problem." That just doesn't happen. So what we do is just try to engage in as much safety planning as we can with the family. As much as we can get the patient on board, we do, but that's often very challenging. So it's something very important for us to always keep in mind.

John Bellone 1:03:07



It's a really tough problem. It can be really hard for the family to manage the person because that person might get upset when you try to help them with their medications, let's say, or because they don't see any reason why they wouldn't be able to do it themselves. They might get mad when you tell them that they just asked the same question for the fifth time. You know, there's no easy solution to this and it's frustrating for all parties. But, a general way to go about it is to try not to fight the person or argue about who's right - it just makes everything worse. I tell families that they should try to provide what I call "invisible support". So keep an eye on their medications or finances - don't trick them about it, but try to find other reasons why they might have you or other family members help out. Like by saying, "Honestly, it's so much easier to just pay bills automatically on the computer". So you'll help them set up that so that they can have more time to do activities that they like or that they don't have to deal with all the paperwork from the bills. You know, find ways around it. But each person is so different, families who are dealing with this should really talk about their specific problems with their own doctors.

Dave Fletcher 1:04:31



Yeah, I can only imagine what it's like to have everybody tell you that you're forgetting things. You know, I tried to tell my mom, I said, "I'm not telling you that you're forgetting stuff just because I don't have anything better to do, right?" You know, and the same with my sister. But yet she tells us she feels fine. I said, "You are fine. When we look at you and and when we talk with you and nobody would know anything else. You look like a healthy person. But, you know, when you ask us six times in the same conversation what time are the kids coming home? There might be something going on." So we'll probably have some more conversations

about that. But I took some notes here. Do we have time for two more quick questions?



Ryan Van Patten 1:05:16

Yeah, definitely.



Dave Fletcher 1:05:18

Okay. Other than yoga and meditation, is there anything out there that I can go read that will talk about how to put your mind at ease for 10 minutes, 30 minutes, or an hour a day, to give it a break from anything? Anything? Any suggested reading that you have? And the reason I ask is because I think that the common theme here is, you know, we're just using our brains a lot, how do we give them a break?



John Bellone 1:05:50

There are so many, so many different things. What I like to tell patients who ask this kind of question is that you should find what you enjoy doing. It's going to be different for every person. Some people like taking a bath for a half hour, some like going for a walk, some like preparing for a marathon, you know, every day working towards a goal. It really doesn't matter, per se. If it's just for the purpose of stress reduction, for, like you said, stepping out of your brain for a little bit and just relaxing, then it really doesn't matter what it is. It should be something that you find just inherently enjoyable and relaxing. You know, try not to have it be eating a tub of ice cream or anything like that [laughs].



Ryan Van Patten 1:06:40

Glad you mentioned that. I guess I have to change some of my routines now. [laughs]



John Bellone 1:06:43

Yeah, right. [laughs] But, whatever it is for you - if it's a crossword puzzle, or it's having a cup of coffee with a friend, or making a phone call to someone who you haven't talked to for a while - whatever it is, that should be what you focus on. You should try to pepper in things throughout your day like that, or at least every day do something that kind of gets you out of that. We could go on and on with this, do you have anything to add, Ryan?

Ryan Van Patten 1:07:12



I generally agree with what John said. Dave, you had mentioned yoga and meditation. So another word that's often thrown around there is "mindfulness". So just a couple minutes of learning to practice mindfulness is really, really good for the brain. We had talked about sleep before and it's so important that I'll mention it again. Getting a consistent good night's rest, that is where the brain is recharging - it's restorative, it's replenishing. So that will help you to have energy throughout the day. If you're able to do that, I would definitely prioritize that. And then there are other general brain health recommendations. John had mentioned earlier a good exercise routine, particularly aerobic cardiovascular exercise - walking, jogging, running, something along those lines that gets the heart rate up and sustained for some time. And then a healthy diet. These are like long-term, good decisions and good behaviors to do that help the brain. But I would agree with John that finding an activity that's relaxing for you, as long as it's not in conflict with other things we mentioned, like sleep, exercise, diet. Obviously nothing like drug use [laughs]. That shouldn't be the thing that's making you feel better, because that's harmful to the brain. But anything that's benign or relaxing can be a good way to take a break.

Dave Fletcher 1:08:40



Okay. Last question. So when my children were in elementary school, my wife is a teacher, I watched her be on the phone, cook dinner, and help them with their schoolwork. Drives me batty. Can people really multitask?



John Bellone 1:08:57

The short answer is no.



Dave Fletcher 1:08:59

Okay, good. [laughs]



John Bellone 1:09:01

[laughs]

Dave Fletcher 1:09:01



But women seem to do what we think is "multitasking" better than men. Is there some truth to that, about how many tasks they can handle? While it's not really simultaneously, is there some truth about the way that the man and the woman's brain is put together there?

Ryan Van Patten 1:09:23

So, to my knowledge, there are no known sex differences in how well we multitask, although I wouldn't use that term to your question. What people think of is multitasking is really what we would call "set shifting" or "switching". So to multitask is simply to switch between several different tasks quickly. A common example is people think that they're multitasking if they are driving and texting. But, really, their brain is not doing both things at the same time. Their brain is switching between driving, and then texting, and driving, and then texting. And certainly some people can do that better than others. Again, I'm not aware of any sex differences in set shifting ability, but as with any other cognitive ability, some people can do it better than others. But it's not that the brain is fully engaged in both activities at the same time. It's that it is doing one and then switching to the other. So, in your example - cooking, having conversations, keeping track of other things in your mind - it's just as taxing on the brain because it's switching back and forth between a lot of things very quickly.



John Bellone 1:10:38

We are not endorsing texting while driving, of course.



Dave Fletcher 1:10:42

[laughs]



Ryan Van Patten 1:10:42

No, no. I'm saying that's why we should not do it. Because when you're texting, you're not driving. There is a lapse in attention at that point.



John Bellone 1:10:49

Exactly. Right. But, people might think, "Oh, I'm better than others at doing that."



Ryan Van Patten 1:10:54

Yeah, good point.



John Bellone 1:10:54

But it detracts from everyone's attention, when they're doing some other activity.



Ryan Van Patten 1:10:58

Right. It's a similar idea to people who might think, "Oh, I can hold my liquor, so I can drink and drive." No, that's not the case. Everyone, no matter how "smart"

someone is or how quickly their brain processes information, everyone is impacted by alcohol, and everyone is impacted by trying to set shift.

Dave Fletcher 1:11:17



Yeah, I'm on 7 to 15 conference calls a week, depending on the week, and in almost every call somebody will ask the host to repeat the question because they were multitasking. And I just have to say, "You weren't multitasking because you didn't hear the question."



Ryan Van Patten 1:11:32

[laughs]



Dave Fletcher 1:11:33

So...



John Bellone 1:11:34

Well done. Yeah. Well said.

Dave Fletcher 1:11:36



I just really enjoyed that podcast for newbies. Yeah, this was awesome. Thanks, guys. I'm sure we'll be chatting again. I'll be listening. Some of them are going a little bit over my head now because I'm not in the field, but I'm still enjoying them.



Ryan Van Patten 1:11:50

Yeah, much appreciated.



John Bellone 1:11:51

Yeah. Thank you. Great questions, really. Enjoyed the conversation and really appreciate your thoroughness and how much thought you put into those.



Ryan Van Patten 1:12:00

Definitely.



Dave Fletcher 1:12:01

Yep, yep. Have a good day.



Ryan Van Patten 1:12:02

Thanks, you too.



John Bellone 1:12:04

Well, that's it for our conversation with Dave Fletcher. We wanted to address one thing that we didn't mention in our episode 2. We didn't say how important psychometrists are to the field of neuropsychology. Psychometrists are trained in administering and scoring various cognitive and psychological tests. Many neuropsychologists work with a psychometrist. So the clinician will do the record review and interview the patient, then pass them to the psychometrist to do the testing. It greatly improves the workflow of the clinician who can use that time to write up the interview, or take care of other things rather than being the one to administer and score the tests. We want to cover this topic more in the future, the profession of psychometry, because it's another path that interested undergrads can potentially pursue, and it is very relevant to neuropsychology.



Ryan Van Patten 1:12:59

As we mentioned at the beginning, we will do this type of episode from time to time - periodically answering lay audience questions when we receive enough of them for a full episode. So we encourage you, your family members, or patients to write us with questions. You can do that by emailing us at feedback@navneuro.com. Or by commenting on the website at navneuro.com/14.



John Bellone 1:13:25

Just a reminder, Ryan and I will be attending INS in New York next week. And in case you'd like to meet us and give us any comments or suggestions in person, we'll be at the Student Liaison Committee's social event on Thursday night. It starts at 7, we'll probably end up getting there closer to 8. It's at The New York Beer Company, right by the conference, and they're going to raffle off a lot of books and other good stuff. So we encourage everyone to try to make it for that. The SLC is also putting on a lot of other great workshops and panels that we listed at the end of our February 1st episode. So make sure to check those out in the INS 2019 app, or the schedule. We look forward to meeting a lot of you next week. That's it for today. Thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.



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