41| Teleneuropsychology – With Dr. Munro Cullum

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NAVIGATING
NEUROPSYCHOLOGY

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Speakers: Munro Cullum, Ryan Van Patten, John Bellone

Intro Music 00:00

Ryan Van Patten 00:17
Welcome, everyone, to Navigating Neuropsychology: A voyage into the depths of the brain and behavior. I'm Ryan Van Patten...

John Bellone 00:24

...and I'm John Bellone. And for those of you who are listening to us for the first time, we'll just give you a very quick overview of who we are. I'm an early career neuropsychologist in a group practice in Southern California, about halfway through the board certification process. And Ryan, my co-host here, is just a couple months away from finishing his neuro psych postdoc at UCSD. Very exciting.

Ryan Van Patten 00:45

Yeah, we typically only release episodes on the 1st and 15th of each month. Today we're doing something special and different in response to the COVID-19 crisis, the pandemic. Specifically we are releasing today's episode on teleneuropsychology because this is quickly becoming a very relevant topic that's on the minds of many neuropsychologists. We plan to get back to our normal content beginning on April 1st. So you can think of today's episode as a bonus.

John Bellone 01:18

You can find out more about us and the show in general at navneuro.com/about, in case you're interested. I wanted to quickly mention that Ryan and I both have training in teleneuropsychology and we have Dr. Don Labbe from the Providence VA to thank for that. He provided great teleneuropsychology supervision to both of us and his program is really a model of how teleneuropsychology can be run effectively. Now, for today's guest, we have Dr. Munro Cullum. He's a board certified clinical neuropsychologist. He's a professor at the University of Texas Southwestern and given his impressive research program, he is definitely the go to person to talk to about teleneuropsychology.

Ryan Van Patten 02:04

Yeah, we're very grateful that we were able to get Munro for the conversation today. You'll notice that a big part of our conversation with him centers around environmental challenges of teleneuropsychology, and how it's difficult to control the environment when we are not present in a room with a patient. So, ironically, you will also notice during our conversation with Munro, we have some environmental interruptions, so to speak. [laughs]

John Bellone 02:32

[laughs] Yeah.

Ryan Van Patten 02:34
He's a popular guy right now and you'll notice that there are some dings on his computer as he's getting emails. So we apologize for those. Just keep in mind every time you hear one, that this sort of thing could happen to you if you're doing a teleneuropsychological evaluation and you don't consider every aspect of the environment.

John Bellone 02:55
He's never done these from his home. [laughs] So this is a different environment for him.

Ryan Van Patten 02:59
And believe me when I say my co-host is very detail oriented when it comes to controlling the sound quality of these podcast episodes. So it was difficult for him to agree to release this with a few email dings. So please forgive us for that. [laughs]

John Bellone 03:14
[laughs] The other caveat that we'll mention is that we didn't talk extensively about billing and reimbursement in case that's why you're listening to this. This is really not an area of specialty for Munro, and it varies by state and province. It's also an area that's rapidly evolving. Our conversation was already two hours long, so we just couldn't include everything. But please stay on the lookout for more information. The Inter-Organizational Practice Committee, the IOPC, and other well respected neuropsych organizations are working on this very hard, as well as the APA just generally. And now we'll give you our conversation with Dr. Cullum.

Transition Music 03:54

John Bellone 04:04
Munro, thanks for coming on NavNeuro. Especially for coming on under such short notice. You're a pretty hot commodity right now. [laughs]

Munro Cullum 04:12
[laughs] It seems so.

John Bellone 04:15
We'll be talking about two different scenarios in this conversation. One of the scenarios is using teleneuropsychology under typical or more ideal circumstances - you know, when we're not facing a pandemic and when most clinics are open and running. And the other scenario is using it under more pressured and suboptimal circumstances, such as what we're dealing with right now with COVID-19 and social distancing. This distinction is going to be really important as we'll see, but to start off, can you define telemedicine and also those nested constructs of telebehavioral health and teleneuropsychology?

Munro Cullum 04:51
Sure. I think telemedicine is really a broad term, much like telehealth, which I think is the more standard or more commonly used term now, that includes all methods of remotely accessing and providing services to patients. Telepsychology is obviously psychological services, which I would put telepsychiatry under that same rubric. Those are a little bit older terms. Teleneuropsychology - well, we knew teleneuropsychology had become primetime when we got it into Wikipedia.

Ryan Van Patten 05:28
[laughs]

John Bellone 05:28
[laughs] That's always the barometer.

Munro Cullum 05:31

Exactly. It's a real thing now. But basically, just remote assessment or provision of services to patients with neuropsychological needs and that includes both assessment as well as treatment and telerehabilitation also.

John Bellone 05:48
What terms do you prefer? I know there are lots of different terms that are thrown around in the literature.

Munro Cullum 05:53
I think the general term telehealth is preferred. When I'm talking about remote neuropsychological testing, I do call it teleneuropsychology.

John Bellone 06:05
Great.

Ryan Van Patten 06:06
How many professionals are regularly using these distance services, would you say? Do you know roughly how many neuropsychologists currently use this modality?

Munro Cullum 06:15
I don't think we actually do have a good sense of how many neuropsychologists are doing it. There have been a couple of surveys that have been done in different areas. Solix group in Australia did a nice survey down there suggesting that it's a small but growing number. And different people are using it for different things. Some are using it for interviews, some for psychotherapy, some for rehabilitation efforts and follow up after patients are seen in clinics. Then I think it's a smaller group that is actually doing it for remote actual testing.

John Bellone 06:49
What are some of the benefits to remote assessment in typical neuropsychological practice?

Munro Cullum 06:54
Well, I think there are several. I mean, getting our services out to underserved remote populations, for example. We and other groups have done some surveys of patients who might be interested in having services provided in this medium, and it has suggested that if somebody has to drive, for example, more than about two hours, they would actually tend to prefer a telemedicine or teleneuropsychology visit to coming into the clinic. Although I think, in general, people prefer to see their doctors in person. We've done some acceptability studies in patients, even with those with cognitive impairment, and there's still a slight preference for them being seen in person. But still most feel it's actually acceptable once they get used to the process.

John Bellone 07:44
Yeah, I've seen some of that data. And, yes, some people actually prefer the teleneuropsych, like 20-30%, I forget, from that study.

Munro Cullum 07:52

Yeah, that's about right. And those were the healthy controls. The patients with dementia didn't really choose it very often as a preference. But they did say they did not have a preference between the two in a lot of the cases. So that we thought was important. Some of the controls that we've tested, though, felt it was more unique and “more fun” is what they said just because it was a different thing or something out of the ordinary for them.

John Bellone 08:19

A couple other potential benefits here, not only to seeing remote patients, but also if it's difficult to coordinate transportation, even if you're in the same city might be disruptive to certain patients. Maybe if they're low SES, for example. Another benefit is that it widens the provider base that you have to choose from. So if you don't have a quality neuropsychologist near you, or if like let's say you don't speak the language and there's no one in your area who speaks Cantonese, well, you can significantly broaden that search.

Munro Cullum 08:51

Absolutely. I think there are potential research advantages as well. Not having to potentially train the psychometrist at all different sites. If you're doing a multi-site trial, you could have a cadre of psychometrists at a home site, if you will, and then do some remote testing. Obviously, there are limitations. You mentioned some really good points, though, about the specialty evaluations. You know, we don't have too many neuropsychologists that speak a lot of different languages. I think that could certainly open up the access. I mean, I would love to use it even within our hospital system. At University of Texas Southwestern Medical Center, we're spread out over about a mile up and down the road, basically, between hospitals and clinics, as many large hospital systems are. It would save me so much travel time just to be able to see a patient via telemedicine or telehealth video, although obviously there are billing limitations and collection limitations that are in place that may restrict that practice from that perspective.

John Bellone 09:55

Right. You might be able to see an extra patient or two if you weren't driving around all those different sites. [laughs]

Munro Cullum 09:59

[laughs] Absolutely.

Ryan Van Patten 10:01
From the neuropsychologist perspective, if we were to implement this more widely, we may be able to specialize more or to work within our specialty area more often. We've mentioned different languages, another example would be in a previous episode, we spoke to Neil Pliskin and he does work with people with electrical injuries. That's just not a common population seen in neuropsychology, especially in any one particular clinic. But imagine if you were the one person in the US who was known for that and then we all just refer electrical injury patients to Neil.

John Bellone 10:33
[laughs]

Ryan Van Patten 10:33
He gets all of them. [laughs]

Munro Cullum 10:35
Sure. I think medical legal evaluations may go in this direction as well. Obviously, there are some limitations. But, certainly, clinical interviews can be done easily remotely with not a lot of differences, quite honestly. I mean, I think the biggest obstacle in the overall telehealth literature has been clinicians acceptance of the procedure, and some people feeling it is just too different or too awkward, which is something we can talk about.

John Bellone 11:06
Yeah, we'll talk about the criticism. And hopefully this episode will help to remedy some of that discrepancy. We'll bring some people on board, hopefully.

Munro Cullum 11:14
Great.

John Bellone 11:16
Give us a sense about what teleneuropsychology typically looks like in clinical practice. This is pre-COVID-19, talking here both maybe brief phone based evaluations but also full neuropsych evaluations via video conferencing. Just a quick overview and description of the environment and the hardware would be sufficient here. We'll ask about the details like what software you might use a bit later, but just just give us a general sense of the environment.

Munro Cullum 11:42

When we started this work this, I mean, this was actually back in like 2006. Basically, we had a geriatric psychiatrist that was seeing patients remotely in a satellite clinic for the Alzheimer Disease Center. And I thought that was a neat idea. And I sat in with him one time, and then got the idea, "Wow, we could probably do a lot of testing in that fashion." So back in those days, you had to have really big dedicated equipment, you know, a special PC unit and special cameras and everything. And, and now, of course, we've got these handheld devices called cell phones that come with Skype and FaceTime and everything. I'm not saying to do a neuropsych evaluation on your cell phone.

Ryan Van Patten 12:28

[laughs]

John Bellone 12:28

[laughs] That would be interesting.

Munro Cullum 12:31

[laughs] But, you know, programs like we're using today, when we can see each other work quite well, too. So, certainly the technology has expanded dramatically, even between the time we did our initial pilot and we completed our funded R01 looking at this, the technology had changed a lot. So, basically, it just depends on the remote end and who's there and what is their setting. Aside from the current virus situation, ideally, you'd have someone going to some sort of clinic or office or something like that, where there would be a desktop computer with a camera built in or a special camera. I really still prefer a mobile camera that I can move from my end so if they're drawing something or writing something, I can actually watch them. If something pops up in the room, I could actually move the camera to look around, which you're more limited in if it was sitting with a PC cam. But really, it just looks like a desk with a PC nowadays. Obviously, the situation is such that you need to be able to see what you're showing them, if you're showing them stimuli. A lot of our verbal tests are quite well suited to this sort of medium as long as you have a good fast audio connection. Sometimes the video will lag if the bandwidth is stretched too much, stretched too thin, or their software is just not really state of the art. So that can still be a bit of a challenge. But the testing environment looks like somebody's sitting at a desk across from a PC instead of across from an examiner. And then it depends on what test you're trying to give. Obviously, the verbal ones are quite easy, most of them. If you're presenting visual stimuli, a lot of considerations need to go into what you are showing them. How are they seeing it?

In the research we did, we were very careful to show on the screen as close as we could to a life size version of whatever the test was. If we're showing a naming test for example, we wanted the stimuli to look about the same size as it would across the desk from them. We also use large monitors so that our faces would look pretty much life size to the clients. Again, that's all changed now with the use of different computers and different cameras and whatnot, but the concept is still the same. You want things to be as normal as possible with a televideo setting. So one of the things I really recommend to folks is that you definitely try it out and practice with this before you just jump into it. I've been getting a lot of emails and questions about, "Hey, what about this test? What about that test?" And, you know, maybe they are preparing really well. But I just have this fear that people are just going to jump on whatever their video provider is, and just start doing tests and then get stuck in the middle and say, "Oh, my gosh, now what do I do?" So I think it's a really good idea to practice. You can practice with your colleagues. It's easier than ever with the internet connections that we have now.

John Bellone 15:46

Yeah, very good advice. A couple things to add to that. So, typically, the person's in the originating site, they call in the literature, where they're at a clinic and there's a proctor there who checks them in, who turns on the computer, makes sure everything's working right, and is available outside the room in case the patient needs them. If they need to go to the restroom, the proctor is there to guide them, for example. One other modification, in addition to having a mobile camera or one that can zoom in and out, I've heard some people using a second camera that's directed at the table so that they can see the stimuli. I guess that's another way of doing it. We'll include some pictures of common setups in our show notes that'll be available at navneuro.com/41 if listeners want to see what we're talking about.

Ryan Van Patten 16:33

So Munro, you mentioned the work that you've done in this area. You've really led the way with some of the research in terms of teleneuropsychology. I want to move into that area and ask you to summarize it. Overall, from my reading, the evidence supports the equivalency of teleneuropsych compared to face-to-face testing, but there's definitely nuance here. So I'll start by saying there are multiple ways to demonstrate equivalency, of teleneuropsych and face-to-face testing. Evidence for equivalency of one test in one clinical population does not necessarily generalize to another test in a different population. You mentioned you've been receiving questions "Is this test valid? Is that test valid?" So we'll start with different methods for determining equivalency. Again, comparing teleneuropsych to face-to-face

testing, which we're using as the gold standard here. So talk about studies investigating reliability, intraclass correlations, validity in terms of discriminating between cognitive impairment and no impairment. What's the evidence?

Munro Cullum 17:41
Sure. And like you say, there are different models for doing teleneuropsychology. Our model was such that we started it in a remote clinic, as I mentioned, and we actually did have a study assistant, a psychometrist trained person at the remote end. Our goal, though, in doing our research was to not utilize them as a

psychometrist because we really wanted to rely upon the video interface to obtain all the data. We initially thought we were going to need to have someone stay in the room with them - so in case they forgot what they were doing, some of the patients had dementia. We studied over 200 individuals, we only had, I believe, one that actually I think forgot what she was doing. This was a Mini Mental [score] of about 15, and about halfway through the exam, she looked into the TV monitor really up close and said, "Well, it's been lovely talking to you."

Ryan Van Patten 18:43
[laughs]

Munro Cullum 18:43
"I don't know what we've done here, but thank you." And then she walked out of the room.

Ryan Van Patten 18:48
Wow.

Munro Cullum 18:48
So most of them you can bring back but obviously there are challenges to the telemedicine interaction.

Ryan Van Patten 18:57
Yeah.

Munro Cullum 18:58

But, you know, statistically, obviously, looking at intraclass correlations are really important. You know, we've examined just mean differences - what are the ranges you're getting looking at t-test or ANOVA approaches to comparing. Some of the

early literature, it wasn't counterbalanced. So we think it's really important in demonstrating equivalence is making sure that you have alternate versions of the test administered in alternate assessment settings. So it's a bit of a complex design that takes some thought to I think really do it well. And that's why I do caution people about trying out a brand new test or this has never been done in this environment. I do think it's helpful to have more literature. When you look at the number of studies published, there still is only really a handful that have actually demonstrated similar findings. Our initial assessment battery was designed for older folks with suspected or known dementia. We found that the videoconference approach did take about five minutes longer on average than the face to face time. We think that was just due to extra instructions and orientation to the environment. But the intraclass correlations across the measures that we've examined are uniformly quite good. Our initial test battery - I don't know if you want me to go through that? Or?

John Bellone 20:28
Sure.

Ryan Van Patten 20:29
Please.

Munro Cullum 20:30
We included the Mini Mental State Exam and the Hopkins Verbal Learning Test Revised. We use digit span forward and backwards, letter fluency, category fluency, Boston Naming Test short form 15 item, and clock drawing. We selected measures that were in some degree of common use in patients with known or suspected dementia and in the aging population. We also wanted to make sure that there were alternate forms available. So, of course, test-retest with the Mini Mental is kind of a no brainer, because there aren't really massively alternate forms, massively different forms. [laughs] Three word recall was different, but orientation stays the same. So if you're redoing that you're going to have a high intraclass correlation, which we did. It was like 0.9 or so. The other intraclass correlations, though, the lowest ones were in the 0.5 to 0.6 range on digit span. For some reason, those were our lowest ones. All the other scores were 0.7, 0.8 pretty much. We looked at Hopkins Verbal Learning Test over time, the learning trials correlated really well as did delayed recall and recognition performance. The correlations between test condition one and test condition two were quite similar to what you'd see in a test-retest using the measure. And then, in a smaller sample, we also looked at the RBANS and we found similarly high correlations. Total skill score was like almost a

0.9 correlation. So again, suggesting really high intraclass correlations for these measures.

In terms of validity, we also then examined patients with known cognitive disorders tested face-to-face and then we did video conference testing with them. Again, seeing very, very similar results between the conditions. That was published in the Archives of Clinical Neuropsychology, I think that was 2018 or 2017, actually. And, again, found that the tests administered in the video conference condition discriminated impaired from non-impaired groups as well as the face-to-face testing situations did. Again, suggesting initial validity on top of the initial reliability. Our R01 was really designed to look at, first of all, feasibility, reliability, and then validity sort of last, if you will. And we do feel like there is good support for that. There have been some nice published reviews of the literature on this and most of the studies have found pretty similar results in these two test conditions also for the measures that have been studied thus far.

John Bellone 23:32
There was a meta analysis in 2017, right? Brearly, I think, is the lead author.

Munro Cullum 23:36
Yes. They found that the face-to-face scores were higher than video conference in about two thirds and the video conference where scores were higher in about a third, but there was no significant difference or no significant overall effect. These are just absolute findings that people tended to do a little bit better in one condition or the other. But, again, that is a systematic review and meta analysis so you've got all sorts of methodologies going into that, although they only found 12 studies at the time.

Ryan Van Patten 24:13
Yeah.

Munro Cullum 24:14
We really thought this was a hot topic that was going to take off years ago, and it seems to be hitting its prime time about now.

Ryan Van Patten 24:21
Right. Yeah. You'll see a lot more going forward now. So based on what you said, it sounds like the literature we do have supports the equivalency of teleneuropsych

compared to face-to-face testing. What would be your elevator pitch? How would you summarize what we know at this point?

Munro Cullum 24:38

Well, I would say that it does appear to be a feasible and viable option for neuropsychological assessment, at least for briefer evaluations. That's one caveat. No one that I know of has looked at really lengthy evaluations. I can actually make some comments, I have some thoughts on that as well. I think we probably ought to keep them to briefer evaluations for a variety of reasons. Although our field is moving to, you know, we've been moving for the last 30 years away from the full day evaluations anyway. How short can we get and maintain our accuracy and maximize utility and helpfulness to patients, obviously, there's a fine line there. You don't want to cross over that and lose those valuable aspects of what we do for our patients. But certainly, I think briefer evaluations are certainly possible, especially if they're predominantly using verbal mediated tasks. But I think the elevator pitch is that this is an underutilized aspect of our practice that actually should become more mainstream.

Ryan Van Patten 25:49

That's great. Give us a little bit more detail about your thoughts related to shorter batteries. You alluded to the fact that there are some reasons why it's particularly helpful to keep the battery short if it's teleneuropsych. What are you thinking?

Munro Cullum 26:05

Well, so part of that is, first of all, we don't have validation data on too many tests. We've published a few papers and Brearly provides a nice overview of the tests that have been looked at to date. There are certainly others that could be done, but we're lacking in some reliability, validity data for some of the tests. When you get into a new way of doing testing, I do worry a bit about examiner drift - people cutting corners doing things a little bit differently because "Oh, well, I didn't have the instructions in front of me so I just, I winged it when I gave this test or that test." And while our tests can survive some degrees of freedom there in terms of flexibility, you don't want to get too far from the standardization procedures of our tests. And I do worry about that if people start letting that slide a little bit and a little bit more over time, and they're hurried, maybe. But my other concern is the remote environment, if you will. If they're in a research office with a research assistant right outside the room, that's a pretty safe environment. You could probably do a fairly lengthy assessment that way, if you give them appropriate breaks and whatnot and then instruct them accordingly. If you're doing an assessment that's in a in a clinic,

or even in someone's home, obviously, there are many, many factors that creep in to challenge the standardization of the environment, and I think place the examination at a greater risk. For example, before we started the call today I turned off my cell phone, got my door closed, I'm not going to have kids running through here today. If you've got a patient, though, it's in an environment that all these things are not as tightly controlled as possible. You're going to be susceptible to unknown interferences. I mean, I could just imagine if I'm testing somebody remotely, and all they have to do is say, "Oh, wait a minute, my phone's ringing", and they can get up and walk away from you.

John Bellone 28:12
Yeah.

Munro Cullum 28:12
It may not be appropriate, but it's not something they probably wouldn't have done had you been sitting there face-to-face with them. It's a different environment. So those sort of uncontrolled factors - or, you know, they get a package delivery, or "Oh, my gosh, on my cell phone I see it's my mom. I have to talk to my mom."

Ryan Van Patten 28:31
Yeah.

Munro Cullum 28:32
And they could turn off your screen. So for those reasons. I think we need to be mindful of the length of the test batteries that we're administering remotely. I do think they should be on the shorter side. The longer any individual test is also, the greater the potential for disruption of the normal flow of the assessment.

Ryan Van Patten 28:56
Yeah, your Wi Fi could go in and out and then the whole test can be invalidated. So you want to keep tests short. You're referring to also social contingencies, which are different. Like you say, in this conversation we're having with you right now, fortunately, hopefully, it'll still go well and we'll be respectful and such, but it's easier for people to feel less pressure to conform to the situation if we are not in the room with them. Another piece of the research that I wanted to expand into was to say that most of the papers I saw were in aging, memory loss, mild cognitive impairment, those sorts of populations. And it's a large swath of what

neuropsychologists see. How well do you think teleneuropsychology generalizes or works in other clinical populations?

Munro Cullum 29:48
That's a really good question. You're right, not much has been done in this sphere in kids at all, for example, or childhood disorders. How do kids adapt to this environment? We're actually working on a project with one of my colleagues here, Lana Harder, she's got an in-home testing paradigm with kids that she's done. We're working on that paper right now. And that does seem to work in a controlled setting. But we started with patients with dementia first of all, because we had an Alzheimer Disease Center and it was a population that's been a long standing interest to me. But also, in thinking about how we were going to start this line of research, we thought about what are some of the more challenging populations? And we thought that people with memory problems, some perhaps with behavioral issues, might be particularly challenging. And then we wondered, what level of cognitive impairment is amenable to assessment remotely? I mentioned our more severely demented patient that decided to wander off in the middle of an eval, but that's 1 out of 200 evals that we've done. So. And we have tested people with Mini Mentals down in the mid-teens, and they've been fine. I mean, they were paired, but they did fine.

Ryan Van Patten 31:13
Right. They got through the eval. Yeah.

Munro Cullum 31:15
Right. So I actually think that conditions where there are known or suspected, especially milder cognitive impairments, are highly suitable. I think there's great room for remote assessment for concussion, traumatic brain injury follow ups. A lot of nice work has been done at the screening level with stroke patients as well. There's a lot of behavioral observations one can do with a televideo interface. You can do a lot of the same things that you would do with a patient. Some of these things we don't think about necessarily once you're beyond your training years, but in terms of just thinking about how is the patient able to communicate with you? How are they connecting? What are your observations about their mannerisms during the interview? Their speech, voice patterns, and whatnot can all be looked at quite nicely, even just as you're doing a mental status examination which we know works quite well with this sort of an interaction. But I think many patients actually and many, many disorders certainly should be amenable to this given the success that we've had in patients with dementia.

John Bellone 32:32
How about building rapport? Do you find that that's just as easy to do over the computer?

Munro Cullum 32:38
Well, and that's been, I think, clinician acceptability of the whole process, dating back to the early days of telepsychology, telepsychiatry. That's always been the concern that you can't get quite the same feel for people. And I agree with that a little bit. It's definitely harder. It's not like you're in the room, you don't have the full experience of being in a room with someone, which does change a little bit. You're not going to pick up on all the nonverbal cues that you might behaviorally - if somebody is tapping their leg nervously, or if they're fidgeting, you might not actually see it on video. It can be a little bit tougher to initially establish rapport. So a few minutes of longer, if you will, of introduction to the process, a little extra small talk and just upbeat, jovial attitude about the process - you know, "Well, I can't see everything going on back there."

John Bellone 33:35
[laughs]

Munro Cullum 33:35
But, whatever, helps build that rapport early on. And explaining that we're going to be doing some tests, like you're on television. That's a term that a lot of our older individuals seem to really relate to. That "I'm on TV."

John Bellone 33:50
"Look, mom." [laughs]

Munro Cullum 33:51
Yeah, yeah. The doctor on TV is testing me. So it's a little harder, I think. But if you look at really where most of the bang for the buck for our diagnostic interviews, a lot of it is based on behavioral observations and verbal interactions. Now, obviously, physical limitations, sensory limitations come into play big time as well. [Background sounds of various electronic alarms and alerts] All my electronics are going off.

John Bellone 34:19
This is where the technology breaks down. [laughs]

Munro Cullum 34:23
Sorry about that.

John Bellone 34:24
That's okay. You're a busy guy. So you're going to get lots of noises coming your way.

Munro Cullum 34:30
You may want to leave that in the clip. I don't know. [laughs]

Ryan Van Patten 34:33
Just don't do what you said the patient did and, you know, hang up on us and answer your phone.

John Bellone 34:37
Or walk away. [laughs]

Munro Cullum 34:37
Right. Right. Exactly. Exactly. So I think just a little more introduction to it and it works pretty well and most people find it acceptable.

John Bellone 34:48
One other question that comes up is whether this is feasible for individuals with sensory impairments. If they're wearing hearing aids or if vision is an issue, does it come up?

Munro Cullum 34:59
Certainly. And obviously, you've got to take those factors into great consideration. And again, that's all the more reason to get in touch with someone - if you've got a patient where you're not sure about how how their hearing is, you probably want to have an initial contact with them via telehealth visit or have one of your office staff do that if you have an office because you need to figure out if their equipment adequate at the remote end. For example, patients who are hard of hearing might have a tough time with computer speakers, but might do great if they're wearing headphones, but they may not have headphones, or they may have old headphones that don't work or they might not remember how to use them or, you know. There's all sorts of caveats like that. Similarly, making sure that they can actually see you. I didn't really comment too much about that earlier, but it's really

important for you to be able to see yourself and what you are showing them, making sure you can see what they're seeing of you.

John Bellone 36:01
As a clinician, you're saying?

Munro Cullum 36:02
Exactly. Because, obviously, if I'm holding up a naming test for you, but you can only see half of it on your screen and I'm getting these weird answers, it might not be your fault.

Ryan Van Patten 36:14
[laughs]

John Bellone 36:14
Sure. One thing I've learned in doing a handful of these is to have the little screen on my end where I can see the patient but to have them disable that so they don't see themselves because it can get in the way with stimuli. It decreases the screen, what they're seeing.

Ryan Van Patten 36:30
It could be distracting to see themselves, maybe looking at themselves and the stimulus you're showing them.

Munro Cullum 36:35
That's an excellent point or making sure that the picture is hanging straight behind you or whatever it is.

Ryan Van Patten 36:41
Right.

Munro Cullum 36:42
Yeah, no, that's really important. And I have not explored a lot of the different companies that provide televideo services. But what I would love is one that we would have a little bit more control over - I would love to be able to turn that off on the patient's end so that I can rest assured that they can't see themselves and

they're not being distracted. You might even think somebody might be hallucinating if they keep looking to the right.

Ryan Van Patten 37:11
[laughs]

Munro Cullum 37:11
But they might be looking at themselves or their cell phone that they're holding to the side.

Ryan Van Patten 37:16
Yeah.

John Bellone 37:16
Yeah.

Munro Cullum 37:17
So yeah, there are all sorts of sensory factors and potential limitations that are much more acute in this setting and you've got to be ready to try to adjust for those things to the extent possible. Of course, some evaluations are not going to be possible remotely due to those limitations.

Ryan Van Patten 37:35
Yeah, that makes sense. A few minutes ago, you spoke about the battery that you've used in your research, the neuropsych tests. I'd like to spend a few more minutes on that. So as I recall, digit span, HVLT, clock drawing, the Boston Naming Test is short for short form, verbal fluency. Are there any other tests that have good data backing them? MMSE?

Munro Cullum 38:03
Yeah, Mini Mental. The MOCA has been done quite nicely as well. There are other verbal tests of the WAIS. Trails has actually been done, although, again, there are issues if you're having to send them materials or if they're downloading materials. That gets into the whole, "What are we doing to our tests? And how are we publicizing tests?" Anyway, that's a whole nother area of discussion. But for example, various aspects of the Boston Diagnostic Aphasia Exam have been done with success. Certainly mental rotations and anything you can show them really, really clearly. WAIS Vocabulary, CVLT, Rey Auditory Verbal Learning Test. Some

people use the Rey–Osterrieth also. We've done clock drawings I mentioned as well as other groups. Some people have done the Benton Visual Retention Test. And then other mental status screening tests as well. People have done some auditory attention tests beyond digit span. Even the Nart has been done, not surprisingly. Picture vocabulary tests can potentially be done. Again, for some of the tests, you need to be aware of potential copyright issues and what's a violation and what's not in showing stimuli. Obviously, if you're sending test stimuli to someone, that's a big risk for test security, as well as test usage. If I send an entire test booklet to my grandmother, what's she going to do with it? Is she going to post it to the local community center? Or where's that going?

John Bellone 39:48
Yeah, yeah.

Ryan Van Patten 39:49
The tests that you mentioned, are you saying that those are the tests that have equivalency data in the literature or that people have tried them out and they've seemed feasible?

Munro Cullum 39:58
Yes, there is at least something on all those ones that I mentioned. Although quite honestly, we haven't reviewed that in a while. I think Brearly's article reviews a lot of the tests that have some data at least. And again, some of them just make a lot of sense. If it's like a vocabulary or similarities or something like that, those obviously would work well via televideo because there's essentially no real difference assuming all other factors are equal. And again, we talked about those other things that can interfere with your exam that might mess up results too. But actually, in our research, we played around with remote administration of block design, although we had to have a set of blocks at the remote end. Again, this was done in the clinic. But the instructions were all for the patient themselves, [they] had to scramble the blocks after each time. And, we might not have gotten a fourth of them with all red or red and half white and whatever, but that seemed to work. But, again, that would require a remote assistant. And that's one whole approach to teleneuropsychology, as you mentioned earlier, but that wasn't the design that we wanted to try out at that time.

John Bellone 41:22
Yeah, it makes sense to have a psychometrist at the other end who can score everything up. I'm curious to hear how you would score something, like the

Rey–Osterrieth, let's say, or the clock drawing. How would you score that if you didn't have a psychometrist? What we've done, it was at a VA setting where the patient was at a satellite clinic and there was an admin at the other end who would print out the battery, put it facedown on the table where the patient would be, the patient just picks up the page on top and works with that one, and then puts it into an envelope afterwards. So the only exposure they have to the stimuli or the record forms is when they're supposed to be using the test. Then the proctor at the very end would seal up that envelope and mail it to us. We would do the scoring once it arrived. So we can actually see their Rey, we can see their clock in person. So that's one way to do it. I've heard of people also holding up the clock to the camera so that you can score it on the fly. But that's probably more common.

Munro Cullum 42:22

I think you're right. Your procedure is a really nice one. We did something similar with our research. We had an administrative assistant at the remote end that would collect all the test forms. We had color coded files, each file folder had a different test in it. So we would say, "Now take the piece of paper out of the yellow folder. When you're done with that, put it over here and now open the blue one." And we were very, very explicit.

John Bellone 42:49

That's a neuropsych test just by itself. [laughs]

Munro Cullum 42:51

That's true! [laughs] And that's a completely fine way to do it. We wondered about scoring things remotely. So when we first did clocks, we did it two ways. Obviously, we had the record form that our administrative assistant at the remote end would collect for us and send to us. Initially, we had plans to buy a digital scanner that would scan all the documents and would be sent via PDF, but we just had them mail it to us. We also learned that you can easily have the patient hold up a clock to your screen for the scoring, you get the same scores. We actually didn't publish that, we didn't think it was too exciting. [laughs] But we scored the clocks remotely via the video screen and we had another examiner score them, and then they compare the scores and they were identical scores.

Ryan Van Patten 43:46

That's actually really important and helpful because it's hard to find visual motor tasks that are easily amenable to this. We've talked about the Rey Complex Figure, we would not be able to do it with the complex figure to have them hold it up. You

know, we're trying to make measurements, if you really want to score it in a standardized way, that's just not going to work. But the clock is different. So it's good to hear that you found good interrater reliability with that.

John Bellone 44:09
Do you think we can apply the same normative comparisons that we do in the normal modality?

Munro Cullum 44:15
You mean for clocks? Or what?

John Bellone 44:17
Not for clocks, just in general?

Munro Cullum 44:19
I think so. As long as you're sticking as close to standard administration as possible, that's really the key. I mean, the scoring is another issue. Obviously you have to have an adequate view of whatever the stimuli are in order to score it. You also need to be sure that what you're, as I mentioned earlier, if you're showing it to them, it needs to be the right size. And there may be differences in showing a patient a large giant clock on a big screen in front of them and then having them draw it small down below. So there may be some subtle differences. But if you're looking at a fairly crude measure, like clock drawing, that's pretty amenable to remote scoring. The other thing, obviously, you can do is when they're holding it up, take a screenshot of it and then save that on your computer. That can be printed out for you to score as well.

Ryan Van Patten 45:17
An environmental issue to think about with clock drawing is, if you're doing the quick and dirty method, "draw the face of a clock", make sure there's not a clock in the room that they can see.

John Bellone 45:28
[laughs]

Ryan Van Patten 45:28
As an examiner, when I'm in the room with people, I always know the room, that they're not just copying a clock that's right above, but we may not know if it's behind the computer.

John Bellone 45:37
Well, I guess you're going to know if you have a MMSE of 11 and they have a perfect clock. [laughs]

Ryan Van Patten 45:44
[laughs]

Munro Cullum 45:45
That's true. Whenever we're working with our trainees doing assessments in the hospital setting, I always tell them, you have to - ideally, you stand between the patient and the clock that is probably in the room somewhere.

Ryan Van Patten 45:59
[laughs]

Munro Cullum 45:59
Otherwise, they can just look at it and tell you what the time is.

Ryan Van Patten 46:02
Right. It’s not the same test.

Munro Cullum 46:03

Definitely in the home environment, they may have clocks everywhere. They may have a calendar handy if you're doing orientation items. So they may have a lot of different things. They may be recording aspects of your session. I mean, hopefully, they're not googling answers to things, or typing out what you said for the next time you test them if they have to be retested. So, again, there's all sorts of potential pitfalls here, too.

John Bellone 46:30
Yeah. If they're in their home, there's no safeguard to that. There's nothing we can do to prevent them from recording, or taking a snapshot with their phone, or

screenshot of the computer. We just have no control over that in the home setting. In the clinic, at least if you're doing it remotely, a lot of that is minimized.

Munro Cullum 46:48

Yeah, I think there are a lot more concerns with the in-home testing. The field of view of your camera, for example, if all you can see is my head, neck and shoulders and you're reading me a list of words, I could be writing down those words, and you're never going to know it. Now, I might be looking down a lot. That might give you a clue. But you have to be really sensitive to that and that's where extra instructions are required too. Then you hope that your patients play by the rules, basically. "Okay, I want to make sure that you don't have any pens or pencils in your hands now." And sometimes you would even need to say, "Can you move the camera so I can see the desk in front of you?"

Ryan Van Patten 47:30

Yeah, so we've started to touch on in-home testing. We've been working this into the conversation. Just to clarify, again, as John said up front, there's two different ways we can think about teleneuropsych. There's what you have done, Munro, and the ideal circumstance. John and I have both done this a few times at the VA, which is more controlled teleneuropsychology where we're in our clinic and the patient is in a controlled setting. Today, with everything that's going on with COVID-19 and social distancing, people are encouraged to not go into work and patients to stay in their homes. So we may be wondering about teleneuropsychology and can we use it in patient's homes. Can they be in their homes, can we be in our homes, can we just fire up Skype and do a full neuropsych evaluation? But as I'm sure listeners can tell, based on what you've said thus far, there's a lot to consider in that regard. So I guess we have several questions for you. We'll start off by saying do states and provinces allow this type of service to be provided home to home?

Munro Cullum 48:36

So obviously, with the COVID-19 situation, there are some states and organizations, jurisdictions that are relaxing all sorts of rules to allow for more telehealth interactions and provision of care to patients. Even the HIPAA regulations are sort of, it's like "HIPAA light" now. You do all you can do, make the best efforts to warn of potential risks and whatnot. But again, usually the wording at the state level is if you're acting in the best interests of the patients and you've done your due diligence to protect information, test security, and all this, you're probably going to be okay. Obviously, everybody is starting to look at this as an option. There are some clinics across the country that are already doing this and trying it out in

the home. Some are using it as more of a triage function to test the waters a little bit. So you might have a televideo visit with a patient with suspected cognitive impairment. You might do your 96116 interview, basically your mental status exam, and then go from there to determine whether or not you need to do more in fact. I suspect some people will say "Golly, maybe that's all I need to know about that patient. Maybe I don't need a full neuropsych in that case, given the limitations of the battery I might be able to obtain remotely." But I think more and more local and state jurisdictions are easing the rules right now during the emergency situation. APA is all over this and actively pursuing strong efforts. American Telemedicine Association also has, along with APA, written letters to Congress supporting more widespread use and acceptance and payment for these remote services, which is a whole nother issue. We've grappled with that already all over the country over the last several years. In fact, Medicare had rules that the patient had to be so many miles away from the provider in order for you to even bill for a telehealth based session. If they were too close, like if they were in my clinic a mile away, they wouldn't pay for it. So I think we need to look at our various organizations. I know the group that's brought NAN and INS and Division 40 Society for Clinical Neuropsychology together, and AACN, Sports Neuropsych Society all have strong efforts along these lines with some informational videos. And the groups will be all providing up to date data because this is changing in this emergency situation almost on a daily basis.

Ryan Van Patten 51:33

Yeah, there's a lot to get into here. That was all great information to start. The way I'm thinking about this is as a push-pull between, obviously, us being in our homes, patients being in their homes, there's a lot to be concerned about in terms of standardization are things equal, test security, stuff that you've touched on thus far, and your research helps with that. But there are still unknowns, and areas we want to be very careful. That's part one. Part two is, I wouldn't want to see hundreds of neuropsychologists sitting on their hands for months on end and patients who could benefit from our services not being seen. If there's a way, if we have to lower the bar a little bit, so that we can help people who otherwise would not receive any services that may be worth it. And obviously, there's a lot of real estate in between those extremes. So the question is, like, where do we go from here?

John Bellone 52:30

There's just the uncertainty of not knowing how long we won't be able to see patients in person, right? Because if this is only going to last two weeks, maybe we can just wait it out, wait out a couple of weeks and not do this. But if it's going to be

six months, we really need to be seeing people in some capacity. And obviously, somewhere in between there is when we would start phasing this in. We just don't know. So I really like how the organizations are positioning to provide guidelines and guidance to clinicians in this time. So let's say this is feasible, we need to start doing these evals, home to home, are there any steps that we need to take to ensure the patient has the adequate infrastructure - internet speed, we talked about a little bit, they have to have a certain bandwidth, I've heard that even like an Ethernet cord might be better than relying on the WiFi for the internet. The audio visual system, we talked a little bit about that. But, anyway, anything else you want to add if the patient is in their home?

Munro Cullum 53:30

Well, I mean, the connectivity issues are certainly paramount. But then there's the other challenges of scheduling at a time that will really, truly work for their environment and for their schedule, such that you need to be sure that's not the day that father in law's bring in the grandkids over, or whatever. It's not the day that the new fridge is being delivered, or at least not the time. So, again, I think it may be beneficial to do that initial 96116 visit and get some of these ground rules established and set up a time for the assessment if they don't have enough time that day. Just being really, really clear. I mean, we always tell our patients, this evaluation may take several hours. I think just being really explicit with that and going above and beyond and saying, "Okay, what we need is we need a two hour, whatever it is, block of time where you're not going to be interrupted. I'm not going to be interrupted. Just going to be you and me interacting in this way. We're going to have to have cell phones off. We're going to have to have people leave you alone. There needs to be space in your home that you can go to if you're in your home, to where you're not going to be interrupted. This is a professional doctor visit. We have to treat it as such." Again, I think just being a little bit more authoritarian with taking charge of what needs to happen. These are things that we really don't think about when patients are coming to our offices because our offices are set up to see patients. They're conducive for that - reduced stimulation, the distractions aren't there. And you do have to worry about them glancing off, "Oh, yeah, I remember that vacation. Oh, sorry. I'm looking at the picture from last year." There's just so many potential confounds there. And again, that's why I really think these need to be briefer evaluations. So if patients could be screened and triaged according to who needs what, and setting up your schedule. So okay, "I talked to Mr. Smith. He probably needs a two hour evaluation. I can do that on Wednesday. He's got this block of time." It's going to take more work on all of our parts, more work on whoever's doing your scheduling for you. If you're doing that yourself, it's going to take more of your time, which obviously gets into billable time as well - that

we're supposed to be paid for the time that we spend on cases. So these things will have to be factored in. And again, I know, Tony Puente is working hard on that from the APA perspective for all of us. But it'll take some modifications. I do think in this crisis time, I agree with you, I hate to see patients going unserved and neuropsychologists potentially going without their lifeblood, if you will. So I am actually encouraging people to give this a try. But with a lot of caveats. It's not business as usual. You're not going to be able to maybe use your favorite test that you have, you might want to look at other tests. And if you are using a new test, you've got to become familiar with it before you jump into this telemedicine environment and just start giving it without knowing the instructions by heart or knowing what the potential challenges are. It's like going back to when we were all in graduate school learning to do these tests, you might need to learn to give some of these tests again.

Ryan Van Patten 57:12
Yeah, I liked your recommendation about practice. I wouldn't want to do this without having practiced with a friend several times to get a feel as to what it's like, because, as we're hopefully making clear, the feel can be very different.

Munro Cullum 57:25
Yeah, in fact, one thing we didn't really talk about, but talking about getting used to it and getting patients used to it, just the eye to eye contact. So if you're looking at me right at my face on your screen, you're not looking at your camera, which makes it look like you're not looking in my eyes.

Ryan Van Patten 57:46
Yeah.

Munro Cullum 57:46
So what I would love to see, and I haven't seen this yet, maybe you guys know. Do any manufacturers make a camera embedded in the middle of the screen?

John Bellone 57:56
I don't know how that would be feasible.

Munro Cullum 57:58
I don't know, either. So like when you're interviewing a patient, you need to not be looking - I mean, you've got to look back and forth. You've got to look at your

camera enough to give them a feel that you're really with them and listening. But you've also got to be glancing down to make your behavioral observations too.

Ryan Van Patten 58:15
Yeah, yeah.

John Bellone 58:15
Good point. There are also, if we're in our home, there are some details that we need to be cognizant of like the lighting and what's behind us, right? So it might be something that compromises our privacy, it might be embarrassing, right? If Ryan's doing this in his home, he's got to take down his Justin Bieber poster from the back. [laughs]

Munro Cullum 58:36
[laughs]

Ryan Van Patten 58:36
And Hello Kitty. [laughs]

John Bellone 58:40
[laughs]

Munro Cullum 58:40
[laughs]

Ryan Van Patten 58:42
Right, we want to try to be professional, even if our personal lives are a little chaotic. [laughs]

Munro Cullum 58:47
No, I'm actually glad you mentioned that. I did a NIH study section yesterday on Zoom. And everybody had their cameras on, of course, just about everybody is in their homes, and some of them were extremely professional, with a plain wood background, big chair behind them. It looked like they were in an office. And others are more like, "Oh, that's interesting. I see they play guitar." You know? Yeah, so that's a really good point. And the lighting, I'm glad you mentioned that because that is so important. They've got to be able to see your facial expressions, your

mannerisms. If you're giving instructions, you need to make sure that the lighting is adequate. And sometimes our home lighting sitting at our desks at our computers is not necessarily ideal for video chatting.

Ryan Van Patten 59:33
Yeah, I'm getting the sense thus far in our conversation, listeners probably as well, that something that would be really helpful is a checklist. Just based on what we've talked to you thus far, I can't remember everything we've touched on. So many things that I would not have thought of. So we can do this based on our conversation with you but I think the IOPC, some of our organizations hopefully will put out this checklist that we agree upon if you are going to even wade into these waters, have this with you and go through step by step all the things you need to consider.

John Bellone 1:00:04
There are some checklists out there. I know the AACN right now has one listed on their site. I've seen another one from the Telebehavioral Institute. We'll link to some of those in the show notes. But yeah, I agree with you, Ryan. The checklist is really important here.

Munro Cullum 1:00:18
Yeah, I totally agree. I think we have to think about it like when we used to get on airplanes, the pilot would go through their checklist. Some of us used to make jokes. "Boy, don't they know what they're doing. Right? They have to go through the checklist."

John Bellone 1:00:32
[laughs]

Munro Cullum 1:00:32
But it's really important. It is easy to overlook any one minor aspect of these details. If you're worrying about the connection speed, camera angle, getting it all adjusted and then you forget about, you know, your latest bottle of wine is open on the counter behind you.

Ryan Van Patten 1:00:53
[laughs]

Munro Cullum 1:00:53
Yeah, you got to pay attention to both sides of things.

John Bellone 1:00:56
Yeah. So some other things that come up, some other potential wrinkles come up when we're doing this home to home. One of the big ones, we talked about test security, how that's potentially compromised. The other one that comes up a lot is patient safety. So if there is suicidal intention, if there's a medical emergency, what do we do in those circumstances?

Munro Cullum 1:01:22
That's an excellent point and patient safety is obviously paramount. Or what if somebody falls when they get up to answer the door?

Ryan Van Patten 1:01:32
Or they have a seizure?

Munro Cullum 1:01:34
Yeah, right. Exactly. You know, so, again, assessing their environment before you get started with the evaluation. Knowing who is present in the residence. Actually, like you say, this checklist, I think a checklist is a great idea. "Who is available to you if you need help today?" Things like that. I also, if you're using a laptop, I always think it's great if you have them show you around their room. "What does your room look like? I just want to see the environment that you're in." You want to make sure the TV is not on in the background and all these other things. [laughs] But it's not a bad idea. Now, obviously, you can get into privacy issues there too. What if you then witness something that shouldn't be there or something bad is going on in the background? I mean, it can really get sticky. But I think having the clinician get an assessment of the patient's immediate environment, where they're going to be taking the tests and undergoing the interview is actually important.

John Bellone 1:02:42
Right. You know where they are. Well, that's maybe the first thing, right? Because you don't know that they're in their home. You need to ask them what the address is. So if you need to call 911 you know where to send them. You need to know the local resources, potentially - if there's a crisis center near their home, maybe get permission to contact a family member. If you have a phone number that they can give you for a family member in case something happens. There are several other

questions about just logistics here. Is there any way to administer performance validity tests? I mean, we talked about the CVLT and there's some embedded measures, the digit span has some embedded measures, but there's no standalone PVT that I can think of.

Ryan Van Patten 1:03:24

Would test security be an issue, particularly an issue for PVTs? Would we even consider forensic evaluations? A lot of the issues we've already talked about would be really amplified - people writing down words, behavior observations, engagement and effort, what do you think?

Munro Cullum 1:03:43

Yeah, no, those are all good questions. You obviously have to pay attention to the test security issues and guidelines. Pearson has relaxed their rules and guidelines, they just put out a nice statement allowing for the video sharing of test stimuli. Again, that they're clearly indicating, not going to be copying forms or sending forms, but showing stimuli as is at least okay for the interim period. We don't know how long that'll last for either. As far as symptom validity testing, I think sticking with some of the simpler, non-proprietary tools to aid in symptom validity assessment. I certainly think that they're not necessarily the best ones, but you could probably do the good old 15 item test. And you could probably even do dot counting, although it'd be different and you'd have to factor in what's the size of it. I think this whole teleneuropsychology is going to issue a need for more aspects of qualitative assessment features and behavioral observations being more. Did the norms actually apply in teleneuropsychology settings? I mean, so far of the tests that have been used, you seem to get the same or very similar results. So we do think that the norms apply as well. I mean, we always talk about norms as being guidelines anyway. So I think they're just going to be a little bit more broader guidelines. You want to call something mild versus moderate, what's the actual T-score? I think, you know, thinking through that carefully, and considering, “Well, when they were doing this test, this is what I observed.” And, maybe that's not fair to count that as a T-score of 34. I think mentally I'm going to make that like it's actually more like a 39. Making some of those adjustments qualitatively.

John Bellone 1:05:53

Obviously, noting all that in the report. Those limitations and those modifications are important.

Munro Cullum 1:05:58
Yes, APA has got some good guidelines on that as well, in terms of indicating what modifications were done. Although I always feel that we, as obsessive professionals, probably don't want to go too overboard with that and make every single observation about everything. So your limitations are half a page and your results are a paragraph.

Ryan Van Patten 1:06:26
[laughs] Yeah.

John Bellone 1:06:27
[laughs] True.

Ryan Van Patten 1:06:28
Yeah, that reminds me of a way I've started to think about this issue of home to home testing, or teleneuropsych in general, which is to say, certainly, we want the checklist, we want to reduce error as much as possible, but even with our best effort, this will not be quite as good. Especially home to home will not be the level of standardization and validity as in person. But that's not the end of the world. I've done testing in inpatient units, I've done testing in the ICU, in patients homes where I'm in their home - my body is in their home, it's not teleneuropsych in their home. And there have been interruptions. And what we've had to do, when we're interpreting the data, is just to step back, as you mentioned. We cannot be quite as granular, we may not be able to make fine tune discriminations that we could make if we had the crisp cutting edge in-person, perfectly standardized assessment, but it's still been useful. It's still certainly better than not testing them at all. We just have to go for more broad strokes.

Munro Cullum 1:07:30
Yeah, I think you bring up some good examples. It's like you say, inpatient evaluations in a hospital room when you've got nurses or PTs opening the door and in the middle of the auditory verbal learning test. Or the noise out in the hallway, you know, we do baseline testing with NFL and NHL teams all over the country. And we're testing them in, not in the locker room per se, we've got private offices, but those offices are adjacent to where these guys run around snapping towels and yelling.

Ryan Van Patten 1:08:03
[laughs]

Munro Cullum 1:08:04
We do need to keep in mind that our tests are quite robust. If you really have a patient's full attention, our tests are pretty robust to those minor fluctuations that occur. So I agree with you. I think you can get a lot more valid data from people in different environments than I think our field is maybe notoriously famous for screening out basically. It's like if they're doing construction in the building next door, and there's this pounding you hear, the examiner inevitably is just bugged by it, right? "Oh my gosh, what's that going to do to. They're paying attention to me." Yet, you can tell if a patient is obviously being distracted or not. And a lot of times, they're not, they're focusing. They're there to see the doctor. They're focusing on you. So, again, maintaining their attention, making sure that your exam really flows really well with telemedicine especially. That you've got all your materials ready to go and that you're even more organized than maybe you would be in your office. I think it is important.

John Bellone 1:09:07
Great. So we have so much more we want to ask you. Before we move on to HIPAA compliance, just quickly wanted to see if you have any other thoughts about assessing children in the home specifically because there are a lot of listserv members who have been asking questions about this. I'm on several online groups and child neuropsychologists are asking about, you know, how do we keep kids attention digitally? Kids have been locked up inside, they're anxious about the situation. The evaluations might not be accepted by schools if they do it via teleconferencing software. Any guidance to the pediatric folks?

Munro Cullum 1:09:49
Those are all excellent questions. I'm not a pediatric neuropsychologist and I don't pretend to be one or play one on TV, but some of my best friends are pediatric neuropsychologists. So I would really defer to them and their techniques to engage the little ones, if you will. But all those points really raise the critical issue, if you're testing a kid and in their home, I mean, you've got to have whatever adult supervision is in place to get that set up and make sure the ground rules are extremely clear. And then, yeah, you may have to pull out your entertainer hat a little bit, be a little bit more upbeat. I think the neuropsychologist and psychometrist that will do best in this environment are the ones that are more engaging in terms of being aware of - this and not something we talked a whole lot about earlier, being

aware of your screen presence, too. So if you're totally deadpan and if you're monotone and that's your normal way of being, that might fly in a clinic, that is not going to be as engaging to someone via televideo. So some of us might need acting lessons to help things going. I think you also need to keep in mind what order of tests you are doing, to make sure that you're alternating. I mean, we should all be doing this anyway. But, alternate them to make sure if you just hit them with a hard one and you might be losing them, tossing something a little bit easier that you think they'll do better with. Maybe even something so easy, that wasn't even part of your evaluation, but you're going to throw it in. "We're gonna do this fluency test," Maybe that wasn't part of my original exam, maybe you're going to do some more mental status sort of things. Keeping kids engaged, that's a challenge in the best of certain situations, right? I would really have to defer to our pediatric colleagues to lend us their expertise. But I think making sure that it's engaging and, again, speaks to our comment that we said several times now about practicing this a priori. Try this out. I mean, I wouldn't use standardized tests necessarily to play with your kids online or whatever, but certainly go through some tasks that are analogous to the things we do just to get their impressions too. I don't know of any patient acceptability data that's been published in kids with teleneuropsychology yet.

John Bellone 1:12:25

So let's move on to HIPAA really quickly. I know we mentioned it briefly. Under ideal circumstances, there is software that is HIPAA compatible. Meaning that these companies allow for a business associate agreement to be signed, there's a BAA, it's called. Zoom is one of the common platforms that people use. There's a healthcare version of Zoom that has the BAA. There's a fee associated with it. I know there are several other companies that offer similar services. Any ones that you prefer?

Munro Cullum 1:13:00

There's a bunch of them out there and some advertise more than others. And we don't have enough literature to have a ton of published experience with the different companies in different environments, or the different technologies and equipment and connections that they have. In the early days when they would say they were, HIPAA compliant or HIPAA compatible, some of them were saying that that actually weren't. So I think they've clamped down, like you're talking about having the BAAs in place to at least help address this issue. But making sure that you do your homework on whatever company and their services are that you're looking at. I think that's where some of the listserv information in our organizations may be helpful in compiling lists of some of the programs that people have found useful,

and perhaps have a little bit better documentation of being HIPAA compliant. And we didn't really touch on the issue of recording sessions, but that opens up a whole nother area. Actually, we've never recorded our sessions and stored them. What if your laptop is stolen? If you've recorded that somewhere, what's cloud based versus not? And how secure is that? What are the security measures by the different companies? And you need to keep in mind, just as you do in the traditional office setting, this is confidential material. These are confidential interactions that we're having with our patients, just as if they were in our office. So we have to give them plenty of information to indicate what are the additional risks to this sort of interaction as well. And that mostly centers around tests, that security of their data - what if their home WiFi is hacked and their neighbor sits in on their evaluation? We have no control over that. I mean, what's the likelihood that somebody is going to find great interest in what we do? I don't know. But that risk is certainly there. So the companies that do best with security and document that to the highest levels are definitely the ones to go with. But then to actually try out different companies. A lot of them will offer a free trial, if you will, just to get a sense of what you like and not like. In our medical school right now, for our conference calls and our meetings, whether that be for teaching, research meetings, clinic catch ups, get togethers, we're using a variety of programs, including Zoom, Microsoft Teams, Skype for Business, and people are using others for teaching as well. And some of them work better for larger groups, some of them seem to have better resolution, some of them just work easier, and some of them are a little clunkier to work with. You need to find one again, do your homework, and find one that you like that seems most easy for you as a neuropsychologist to use as well. What you don't want to have happen is some technical glitch that's your fault - you're going to lose credibility really fast.

John Bellone 1:16:13

Yeah, I agree. And we talked before about how the Health and Human Services has relaxed enforcement of HIPAA privacy and security during this pandemic emergency. I still think, though, that it's in our best interest to seek out the platforms that have the BAA. Even though you can right now technically FaceTime your patient or meet them via Skype, it's probably best to just be extra careful and protect ourselves.

Munro Cullum 1:16:42

I strongly agree with that. I think people will end up getting into trouble if they're using really unprotected video chat interactions to provide professional services. I just think there are too many potential risks to that. You're really exposing yourself

to those risks as well. Along those lines, I don't know if we've entered in the era of our professional insurance companies dealing with claims related to problems with inadvertent disclosure of information, or you know, "My picture wound up on Facebook, during my eval" or whatever. Or "I videotaped my doctor asking me all these [questions]" or "My attorney wanted me to videotape my doctor asking me these questions", right? So, yeah, all sorts of things. But I totally agree with you that we need to pretend as if HIPAA is essentially in full effect for us really with some some minor flexibility, I would say.

John Bellone 1:17:44

Good. Yeah. And people should just talk about the malpractice, probably a good time to, if you're going to be doing this, call your liability carrier, ask them if this is kosher, and call your state board too. I mean, really seek out the information specific to you so that you're protected.

Munro Cullum 1:18:00

Yes. And along those lines, I think seeking that state by state information is really, really important. Some states allow across state line practice. A lot don't. And still a lot, you must be licensed where you're at and you must be licensed where the patient is at. So definitely check into those rules and regulations that guide your practice locally.

John Bellone 1:18:25

Okay, so let's talk about another big one - informed consents. Especially in this modality, it is important that the patient knows what we're doing, why we're doing it. So along those lines, do you advise clinicians to have a telehealth agreement that is separate from their normal informed consent document? Or do you just weave it into your typical procedure? What language do you use?

Munro Cullum 1:18:51

That's a great question. Actually, the APA, in their practice guidelines on telepsychology has some really nice, specific recommendations along those lines. But, I do encourage additional language for teleneuropsychology practice. You've got to fully inform them if anything is going to be recorded in any way, if you're going to take any snapshots of them, certainly, obviously adhering to HIPAA as appropriate. Documenting how you're obtaining informed consent. The big discussion that is required, I think, that has to be enhanced from what we usually do is an extended discussion about what are the risks to privacy, which is, I think, really the biggest risk. Make sure that you're ready for interruptions in the process.

Make sure you're discussing billing as you would normally. And then of course, recording what technology and programs that you were actually using. I don't know that you need to put that in your report, but I would record that somewhere.

John Bellone 1:19:58
And tell the patient specifically, like, "I'm going to be using Zoom for business" and explain all those details to them upfront.

Munro Cullum 1:20:05
I definitely would. I mean, they'll probably be aware of that because you have to establish a connection with them. But I think telling them specifically, and if you're not going to be recording them, I would actually be explicit to tell them you're not recording them to reassure them you're not. Clearly, if you are, you need consent for that, too. That needs to be very clearly spelled out. A video recording or an audio recording may be made of you during this time. What will you do with it then? How long will it be stored for? Who's gonna have access to it? All these things. Again, that's why I generally recommend not doing any recording, although there is I guess a cyber version of any of these things that we're doing online anyway. But again, that's why you want a trusted, secure program that you're using to carry out these examinations.

John Bellone 1:20:59
Right. And there are some templates of informed consent documents. But I mean, rather than just throwing in a sentence or two in your informed consent, you really have to think this through and look at examples. Maybe run it by a lawyer, maybe a legal team, your malpractice company. You really have to protect yourself. And the other common question is, well, how do you get signatures for this? It's different from them being in your office where they can just sign it and you have it. You can mail it ahead of time, or if you email it, you can have them print it out. But are they going to mail back the scanned and signed documents? Are they going to scan and email it to you? What if they don't? How do you work through this?

Munro Cullum 1:21:37
Yeah, I mean, that depends a lot on your setting and if you're in an organization, what do they want you to be doing? Sometimes an email consent to the evaluation may suffice in some settings. I know I've heard some people are actually sending PDFs and having the patient sign that electronically ahead of time. But again, they have to be technologically capable, or somebody in their family does. And that's another way, to reach out to the family members and say, "Okay, we need to get so

and so to sign this. And then I need to get a copy, electronically or you can mail it to me." Regarding the template, I think it's one of the tasks that our organizations are going to be working on. It's a good template for us to use where we're providing enough information but not going overboard with all the potential risks. Like, you know, you hear about the drugs advertised to treat whatever on TV and it may cause, you know, 5000 symptoms. [laughs]

Ryan Van Patten 1:22:40
[laughs]

Munro Cullum 1:22:42
And so we don't want to list out necessarily everything remotely that might happen. But I think spelling out the genuine risks. If the video transmission is somehow hacked or redirected, maybe the company has a glitch where they swap our channels. And now I'm watching you live today instead of my patient. I haven't heard of that happening, but again, just making sure people are aware of that, and that we are covered, like you say, with the language we're using in the consent forms for these procedures.

John Bellone 1:23:13
Yeah, I guess if it's at a satellite clinic, it's easy to get the signature and then have the admin file it. But in the home, I really don't know what the best practice would be here. And there's also a potential problem with email, right? Because that could be insecure, especially on their end. It's not encrypted. Someone could intercept it. I know in California here, I'm not sure if this is federal, but we're supposed to get their signature and inform them about the email privacy issues before they email us. And so we're not supposed to accept or communicate by email until we can talk to them. Maybe our admin can do that for us, I'm not sure.

Munro Cullum 1:23:57
Yeah. And some of the electronic health records have options for direct communication with patients too, like Epic. We're big into using MyChart. I'm sure many institutions have that. We actually have our questionnaires before patients come in for a neuropsych evaluation, we have them fill out those questionnaires and put them into MyChart so we can see them before we even see the patient. So again, I think using our EHRs for those aspects of consent may be really helpful as well, for those that are using EHRs.

John Bellone 1:24:34
Yeah, good point.

Ryan Van Patten 1:24:36
Another big area of concern - so I'm here at UCSD and a lot of people are worried about clinical hours for students and trainees. People are on internship or in grad school applying to internship and they were relying on accruing clinical hours during this time. So that's something that is on people's minds, I guess. First and foremost, I'm wondering if we are doing teleneuropsych if that can be counted as clinical hours for people. John and I were trainees when we used it at the VA, but that was the more conventional type of teleneuropsych - clinic to clinic, not home to home. In this conversation, we're speculating about can a neuropsychologist even really do this home to home thing? Then how do they incorporate a trainee? You know, with social distancing, they shouldn't have the trainee over to their house.

John Bellone 1:25:29
[laughs]

Ryan Van Patten 1:25:30
But do you have the clinician home to home, and then the trainee is helping with testing or a psychometrist is doing the testing, that adds a whole nother home.

John Bellone 1:25:39
They're supposed to be on-site, too. The supervisor is supposed to be on-site technically.

Ryan Van Patten 1:25:43
Right. So we are opening many cans of worms. We know you don't have all the answers to everything. I'm just curious about your thoughts in terms of training?

Munro Cullum 1:25:52
Well, so, yeah, we have a PhD program here at UT Southwestern with a neuropsychology track in it. Our clinic is led by Dr. Laura Lacritz. And Laura's done a great job setting up all the activities for our interns during this time. And obviously, we're having them do supervision as usual, although it's just remote now, it's video. We're having them do case conferences, case discussions, prep for board certification. We just did our postdoc ABPP seminar yesterday, we're reviewing cases that way. I actually do think that you could involve a trainee in these sort of

assessment environments, whether they're observing you as a clinical activity. You're right, they would have to Skype in or join however you have your video set up, so there have to be three different connections made. So it's more than just one on one. And then, of course, you have to let the patient know that this is going on too. [laughs]

John Bellone 1:26:55
It has to be secure on the trainee's end.

Munro Cullum 1:26:57

Exactly, right. Yeah. I mean, it's really challenging, though, but a lot of programs are making these changes too - assigning more clinically relevant readings, having more case discussions surrounding clinical materials. But actually, they could certainly potentially get involved in conducting these sorts of evaluations and being remotely observed, as well as supervised if it would be called for.

Ryan Van Patten 1:27:29

Yeah, that makes sense. Hopefully, people can recoup some of the hours that they're missing. Something else for trainees to think about is that for any individual trainee, you are not alone. Everyone right now is missing their clinical hours. So everyone who's applying to internship is on the same level playing field. All those applications, those people will have fewer hours than they would have had. At least it's not a differential challenge. It's not unfair to some people versus others because everyone is affected by COVID-19.

Munro Cullum 1:28:01

Yeah, that's true. Although I think some programs might be dealing differently than others. Making sure that you're providing additional clinical learning opportunities during this time. I mean, if some are just sent home and told to do nothing, then yeah, you're going to be probably way short on hours. So if there are trainees on the line, put your supervisors to work. [laughs] Maybe you're reviewing clinical cases that you as a supervisor, it's a patient you saw three years ago, but now you're showing the trainee the data. You send them a PDF of de-identified information. "Let's do supervision on this case. It's a case I saw three years ago, but does that matter for your learning experience?" So I think, again, it's going to take more work on a lot of people's parts to provide the training support. But, there's a lot of didactics online and I would encourage people, not just trainees but for people for their CEUs also. Stock up now, there's all these seminars and webinars on different topics. If you have a little bit of "downtime" during this, put it to

good use. The other thing is to think about - I really, whenever I give a talk on teleneuropsychology, I always toss in there, I really want people to be thinking creatively about what new measures can we be developing to assess human cognition, especially remotely via televideo conference? We've got a lot of great computer tests that are coming out all the time. Well, what can be done remotely with the simultaneous observation? How can we get away from some of the test paradigms that were developed 40 or 50 years ago? Erin Bigler does some really lovely talks on this and he talks about integrating more modern, clinical cognitive neuroscience with clinical neuropsychology. And I think that's really important. And we have an opportunity to look outside the box now. Of course, a lot of this takes immense validation in whatnot, but hopefully some of the researchers out there can get their thinking caps on and at least start to start some conversations.

Ryan Van Patten 1:28:09

Yeah, I'm so glad you mentioned that. You're preaching to the choir talking about computerized testing. John and I are both big fans of that. We've spoken to Bob Bilder about it. Julie hook with the NIH toolbox. The D-KEFS 2.0 will be coming out in the relatively near future, which will be computer based. So there's irony in this conversation with you. We're talking about teleneuropsychology with paper-pencil tests. [laughs] You know, someone might wonder why are you doing teleneuropsych with paper pencil tests? Why not computerized tests? It will be so much easier.

Munro Cullum 1:30:48

Well, there are obviously, as you all know, as well as I do, there are immense problems with computerized testing, and immense limitations. Also, from a distance perspective, or remote assessment, I want to see what the patient's doing in real time. Do I just want to send my patient to this website and have them take a test? And then I log in and I look at the results? I mean, I can do that. What about your behavioral observations? What about assessment of delayed recall that our computerized tests aren't good at? I'm still an old fashioned guy as well. I think this whole experience we're going through now may help us think outside the box, though, in terms of developing some newer computerized measures that are maybe designed for remote administration. It can be done, it would be extremely costly, I think, to optimize them, but maybe that's the direction our field will begin taking.

Ryan Van Patten 1:31:47

Yeah, and we could administer computerized tests where we are observing them take the test. I imagine the computerized Wisconsin. We could still have their

camera on and we're watching them to the extent we can see what they're doing on the computer. If they're banging their fists on the keyboard because they're frustrated [laughs]. But I agree with you.

John Bellone 1:31:56
They can't physically throw the cards at us, at least. [laughs]

Ryan Van Patten 1:32:09

At least. Yeah, I agree with you. We certainly don't want to just send people to a website, never lay eyes on them. We would be losing a lot in translation in that case, yeah. This is pie in the sky. We just don't have this right now, unfortunately. But it'd be nice to have a nice computerized battery that we could administer while we're interacting with them, at least for part of the time.

Munro Cullum 1:32:33

I honestly think that's a wave of the future, quite honestly. Where you've got a real time assessment going on, you can observe the patient while they're taking the test. And then at your site, you can also see the results in real time with the normative values that pop right up. And you can actually give feedback at the end of your session with all your normative scores and graphs depicted on your screen handily while your patient's face is up here, and you're talking to them. So, again, maybe pie in the sky now, but I think that is quite possible for our field to achieve.

Ryan Van Patten 1:33:11

I don't want to scoop ourselves, but we spoke to Dean Delis recently. We'll be releasing that episode in a few months. And the D-KEFS 2.0 I think is going to be pretty revolutionary in that regard. So more to come on that.

John Bellone 1:33:23
It gives you the scores right after. You can decide based on the standardized score, whether or not to advance to the next subtest, the next trial, for example.

Munro Cullum 1:33:32

Well, Dean was one of my supervisors when I was an intern and a fellow and he's always been a step ahead in many, many directions, in many ways. Not so much in others, but… [laughs]

John Bellone 1:33:46
[laughs]

Ryan Van Patten 1:33:46
[laughs] We won't talk about those.

John Bellone 1:33:49
Yeah, so I guess the take home is we...

Munro Cullum 1:33:51
you could edit that out. [laughs]

Ryan Van Patten 1:33:54
[laughs]

John Bellone 1:33:54
[laughs] We need to get creative here, basically, and start thinking about things as we put our heads together as a field and think about what works, what doesn't, what we need to modify, what we need to completely create from scratch. And I know many clinicians are talking about using the NIH Toolbox and using these computerized tests right now. And I think it's worth trying, but we have to be careful doing that in this distance modality. Like everything, we have to be careful with it.

Ryan Van Patten 1:34:23
There's a danger of rushing into things right now because of the pressure that's on neuropsychologists who are fee for service, who are no longer making any money all of a sudden. That's, you know, it's a terrible situation. I feel grateful that I'm not in that situation right now. But I wouldn't want neuropsychology to be done in a suboptimal way, if we're rushing into it to try to recoup some lost compensation.

Munro Cullum 1:34:48
Right. And that's why I think at this point, in this case, emergency situation, that people ought to be continuing to do things that they're comfortable with and familiar with, but adapting to this new medium of communication and interaction with patients.

John Bellone 1:35:06
Yeah. And you had mentioned activities for trainees to do. I think it's great that you're thinking ahead and thinking about old cases that you can talk to trainees about. This is also a perfect chance to get caught up on your favorite NavNeuro episodes, for all the trainees and neuropsychologists out there. [laughs]

Ryan Van Patten 1:35:22
[laughs] Yeah, nice plug.

John Bellone 1:35:26
Seamless. Seamless plug. [laughs]

Ryan Van Patten 1:35:28

I mean, I would add to that, though, in all seriousness, I like what you said Munro, about downtime. So if we're not seeing patients, that doesn't mean that we can't do neuropsychology. Lezak has a great book that has many hundreds of pages.

Munro Cullum 1:35:44
[laughs]

Ryan Van Patten 1:35:44

I'm not saying you should read all of it. But obviously, there's a ton of great literature to read. There are resources, books, of course, we would love people to listen to NavNeuro. But really what's important is to stay up to date, maybe brush up on literature you haven't had time to read recently. Review old cases, that's a great way to get supervision. Be creative about how to use your time productively.

Munro Cullum 1:36:06

Also, like you say, listening to podcasts that you guys have done over time. Downloading some talks from some of our meetings that have been posted online that you've attended that maybe you want to brush up on, or didn't get the slides for. I really think people ought to look for those opportunities. And then stay tuned to new information as it's coming out from all of our organizations. I will confess, I'm not on any listservs. I get too many emails as it is anyway. I do hear from people that are on lists who certainly tell me about the issues and the topics. But our organizations are working pretty quickly to get information out there about things that may be helpful during this time. Other things that I think we sometimes forget to remind each other of is that just to make sure we're maintaining our own good

health and behavior practices for ourselves. Not just washing your hands a lot, but also maintaining connection with people. For example, I have no fewer meetings now than I did three weeks ago. Just they're all in this sort of environment. Probably fewer phone calls, though, which is kind of interesting. I think this whole situation has caused people to distance and distract themselves in different ways. But it is a really good time for catching up on readings. So many CEU offerings now. A lot of organizations are offering them free now or at reduced costs. So, yeah, what did you always want to learn about? Do you want to read up on that test that you always thought about getting into? Well, look at the literature on it. Take some time to find some articles.

Ryan Van Patten 1:37:52

Yeah, you mentioned social distancing, and I thought a lot about the psychological ramifications of that. We are psychologists, and this is not an area of expertise for me in particular, it's just something I think psychologists in general should be thinking about. It's the right thing to do, certainly right now to flatten the curve and slow the spread. But there will be negative effects, social isolation, loneliness, depression, that will happen now and in the future as people socially distance themselves. So I think that's something for us to think about.

Munro Cullum 1:38:25

I totally agree. I just suggested to a couple of groups I'm with that we do virtual happy hours once in a while, too.

Ryan Van Patten 1:38:31

Yeah. I like the sound of that.

John Bellone 1:38:33

So, I know we've talked to you for quite a while. We have just a couple other quick questions for you, if you're up for it.

Munro Cullum 1:38:39

Sure.

John Bellone 1:38:40

You've done teleneuropsych work with diverse populations. I know I've seen a couple of papers of yours in rural American Indians. Can you talk about the

importance of cultural awareness and responsivity? As your catchment area increases, obviously you're going to encounter more and more cultures.

Munro Cullum 1:38:57

Yes. And that's really important. I guess I don't see it as any different from what you would do in terms of cultural awareness in your office. But you're right. If your network of referrals is expanding, you may come up with this issue more and more. If you're doing a telemedicine or telehealth visit with someone, being aware of maybe the cultural setting that that's occurring in is also important. I mean, if you're seeing them in their home, they're in their home. That's normally a very private place for most people. So I think our awareness of nuances in cultural socioeconomic, other differences - it just has to be heightened a bit. I think, actually, talking about checklists for teleneuropsychology, I would definitely have that on the checklist as well if it's not. As you know, what are the cultural considerations I may want to make? I mean, obviously, if you need an interpreter, that's going to add a whole other dimension of things, but may not be that much different than what you face in your clinic situation too. Obviously, there are problems with interpreters,

there's problems with different versions of what test you use for somebody that only speaks Farsi or whatever the language might be. And, again, using your best clinical judgment. That's one of the things in all the ethical guidelines from APA and elsewhere. We published some guidelines years ago, just suggested practices, just making sure that you're being the best possible clinician you can be, and abiding by all of our ethical principles but taking it almost to another level with this telepresence environment that we're now in, because I think we have to even more sensitive. Some of these subtle things, cues about someone's clothing, their racial background, you might not be able to pick up on a subtle accent as well, if their microphone isn't the best or if your audio system isn't the best. You might not be able to tell if there are skin color variations or differences that otherwise might be important to that person and for you to know about seeing them on a video. Like if it's a dark room, and they say they have no lights and their muffled voice, you'll need to ask questions about - I mean, you should be anyway asking about their cultural background and ethnic identification or whatnot. But again, you may have to pay even more attention to those things in this environment.

John Bellone 1:41:41

Okay, great. Even though this is a special episode, we're not letting you off the hook with the bonus questions here. [laughs]

Ryan Van Patten 1:41:47
[laughs]

John Bellone 1:41:47
So before I ask you the first bonus question, though, do you have a take home message? I think it might be helpful. We talked about a lot of the potential criticisms of teleneuropsychology. We've talked about reliability and validity to some extent. And there is literature, we'll link to some of those papers. But both just teleneuropsych in ideal circumstances and then telepsych in the home, if you have a take home message for those.

Munro Cullum 1:42:18
I think you're right, we have talked a lot about the limitations and the caveats. And those obviously need to be emphasized, because we don't want people just running out and doing this willy nilly and thinking they can do every test under the sun and business as usual. You know, "My four hour evaluation in the home should be no problem." We don't want people thinking that. But one of the other messages that we'd like to leave folks with is don't be scared of this technology either. Don't be afraid to give it a try. Now, we do encourage you to try it out beforehand before you go live with a real patient. But try it with friends and family and get a feel for the program that you think you want to use. But I guess that's the message. Be aware, but don't be afraid to try the technology. It's going to be out of a lot of people's comfort zones, I think. But I think you have to give it a shot before you can dismiss it also. I have heard some talk on some of the listservs about people not wanting to do it, they're not going to do it. It's not ethical or whatever. I disagree. And I would rather provide a service that might help someone. It might not be as ideal as having the patient come into my office. But, by golly, with a lot of our tests you can get pretty darn close. And I do you think it can be helpful, especially during this crisis time. And that's the other thing to think about too is that even if you put a toe into this pool, if you just start doing a little bit of work, it doesn't mean you're going to do it forever. I mean our practices will get back to normal. This may change some things. It may open the doors for wider acceptance and wider reimbursement opportunities for telemedicine based videos or telemedicine based assessments. But I don't think that's going to change the fundamental practice of neuropsychology. So I don't think by participating in it, you need to be worried that you're somehow contributing to the erosion of our field. I think it's to the enhancement of it and the expansion of it. We don't have enough neuropsychologists to go around anyway, especially those with extreme specialty

areas. So I think it's a real opportunity. But I guess that's my other message - don't be afraid to give it a shot.

Ryan Van Patten 1:44:31

Yeah, I really appreciate your balanced approach there. It's analogous and it reminds me of a balanced approach, the Goldilocks approach, to COVID-19 more broadly. We want to take it seriously, we don't want to ignore it or be apathetic, but we also don't want to panic and cause all sorts of negative downstream effects. Similarly, with teleneuropsychology, we want to be careful and thoughtful and not just rush into it, but we could use it for our benefit. We don't want to be so afraid of it that we don't touch it and waste time and this great resource.

Munro Cullum 1:45:05

You get to stay safe from viruses, too. At least the human viruses. I don't know about technology.

Ryan Van Patten 1:45:12

[laughs]

John Bellone 1:45:13

It's true, right? We have another cadre of viruses to think of. Okay, bonus question number one, and this doesn't have to be specific to teleneuropsychology, but if you can improve one thing about the field of neuropsychology, what would that be?

Munro Cullum 1:45:26

Well, I think we would develop some new tests that build on some of the successes and advancements we've seen in cognitive neuroscience and from some of the data that we've acquired from neuroimaging studies, functional neuroimaging. I think our fields need to come together. And you mentioned Dean Delis earlier, I think he's a great example of the newer generation of test development and thinking outside the box. And I think we need more people to do that. Our field is always at risk of getting stuck too much in the past when we're using tests that were created so long ago. So I think that's one of the goals for our field for sure.

Ryan Van Patten 1:46:10

Yeah. That's great. And our second bonus question, what is one bit of advice that you wish someone told you when you were training or that someone did tell you that really made a difference? So we're looking for an actionable step that trainees

can take that they might not have thought of that can improve their training and performance.

Munro Cullum 1:46:28

I would encourage people to really get to know their supervisors and get to know them outside of just the supervision sessions, if you will. I learned so much with the great mentors I've had over the years. Nelson Butters, Erin Bigler, Dean Delis, Bob Heaton, and others. I know I've excluded - I'm going to offend somebody by leaving somebody out there.

Ryan Van Patten 1:46:54

[laughs]

John Bellone 1:46:54

[laughs]

Munro Cullum 1:46:54

I know I did. But really getting to know them and having them introduce you to the field of neuropsychology and some of the politics of the field as well. Who's who? What organizations to get involved with? How do you get involved with organizations? I think that early organizational involvement was really important. So many of my mentors were involved in national organizations and I looked up to them and saw the contributions that they were able to make and how they were able to really impact the field, large numbers of people, not just trainees but practicing neuropsychologists as well. And to get a real source of pride out of those contributions. The other thing is, obviously, keeping your nose to the grindstone at all times. I always get a little nervous when people tell me about the work-life balance, especially during this crazy time right now. It seems unbalanced right now, with even more work. But I think finding good mentors, and actually we wrote a book chapter this last year on mentoring in neuropsychology. There's actually some literature on mentoring and guidelines along those lines. But one of the things that we point out in our chapter. It was done with Shawn McClintock and Laura Lacritz. We talk about having different mentors for different things too. One mentor might be the ideal clinical mentor and yet somebody else might be the ideal mentor for getting involved in organizations. And another one might be your science mentor. How do you get an article submitted? How do I get the best postdoc possible? And I guess, the last thing I would say is, keep in touch with your mentors too. Mentors love to see and hear about the successes that all of our trainees have. It's a real source of pride. But your mentors can be real great sources of ongoing information

and sources of support as well. So reaching out, letting them know that they did a good job in fact when they mentored you on your internship, you know, six years ago.

John Bellone 1:49:09

Yeah, good advice. Great. Well Munro, please continue to promote this modality and continue with the research that you've been doing both for the sake of our patients and for our livelihoods as neuropsychologists. We really appreciate both the time you've taken here but also just in general. Your research program has really contributed to this area.

Munro Cullum 1:49:31

Well, I really appreciate that. I appreciate the opportunity to talk with you all today. You know, when we did this work years ago, it didn't seem to really catch on too big. And now suddenly, there's a flood of interest in it.

Ryan Van Patten 1:49:42

[laughs] I have no idea why.

John Bellone 1:49:43

Yeah. [laughs]

Munro Cullum 1:49:45

I'm just delighted that we did it when we did. There's still more to be done, of course. And I want to commend you all for these podcasts that you're doing too. I will confess, I'm going to become a convert and I'm going to sign up. I'm going to start listening because I know you've had a bunch of good people on, not counting today but...

Ryan Van Patten 1:50:06

[laughs]

John Bellone 1:50:08

You can skip that episode. That's okay. [laughs]

Munro Cullum 1:50:11
And I think you're actually going to be the first ones to get a real update on this teleneuropsychology thing out there to the public. So I commend you for that, too. And thank you for the opportunity.

Ryan Van Patten 1:50:22
Yeah, thank you very much, Munro.

John Bellone 1:50:24
Let us know if there's anything we can do to help you.

Munro Cullum 1:50:26
Well, vice versa as well. I would also like to encourage people to start collecting data. Everybody ought to be recording what procedures they're using for these televisits - what tests of use, how many have you done. We need to be thinking about writing up some case series, even if it's not the strong methodological papers, per se, but telemedicine in MS, telemedicine in stroke. Let's get this stuff rolling out there. And a lot of clinicians could actually do that and contribute nicely to the research literature as well, especially if they do have some downtime in this period. But also if I can help you all with publicizing things, I think everybody in IOPC is aware of what you're doing, which is really good. But if you can think of things and ways I can help you all get the word out about your podcast, just let me know too. I'm happy to help.

Ryan Van Patten 1:51:20
Thanks so much.

Munro Cullum 1:51:21
It was great meeting you.

Ryan Van Patten 1:51:22
Likewise.

John Bellone 1:51:22
You too, via video chat here. This is great. [laughs]

Ryan Van Patten 1:51:24
[laughs]

Munro Cullum 1:51:25
I hope you can somehow make this turnout to where it sounds good. [laughs]

Ryan Van Patten 1:51:30
[laughs]

John Bellone 1:51:30
[laughs] Yeah, we might have to edit Ryan's stuff a little bit, but we'll make it happen.

Ryan Van Patten 1:51:35
Thanks again. Take care. Bye.

Transition Music 1:51:37

John Bellone 1:51:42
Well, that's it for our conversation with Munro. Like we mentioned in the episode, we have lots of resources and references in our show notes. Those are available at navneuro.com/41. If this is your first time listening to us, feel free to check out our other content. You can find it at navneuro.com, or on any of the major podcast platforms. We'll be back with our planned content on the 1st. Thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.

Exit Music 1:52:14

John Bellone 1:52:38
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Ryan Van Patten 1:52:49

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