External Cognitive Aids for Adults with Acquired Cognitive Deficits

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Presenter: Jessica Brown, PhD, CCC-SLP

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- [Amy] And at this time it is a pleasure to introduce Dr. Jessica Brown, who is presenting external cognitive aids for adults with acquired cognitive deficits. Dr. Jessica Brown is an assistant professor in the Department of Speech, Language and Hearing Sciences at the University of Arizona and currently runs the Cognitive-Communication Lab. You can learn more about Dr. Brown by visiting her website, and so with that, Jessica, you can go ahead and turn on your mic and your webcam and start your presentation.

- [Jessica] All right, thank you so much, Amy, and thank you everyone for joining me today. I know it's the middle of the day for a lot of you. So I appreciate you taking time to be here. As Amy mentioned, today we're gonna talk about the use of external cognitive supports for individuals with acquired cognitive impairments kind of across the spectrum, and then what we're gonna end up doing is focusing on a couple of populations towards the end here, where maybe some of the stuff that I talk about is gonna differ depending on who you're working with and what kind of cognitive concern.

So some learning outcomes here for us. Today, we are going to start with describing the impact of cognitive deficits on some of the functional outcomes for people with acquired brain injuries and examine some rehabilitation models that are available and appropriate for this population. I'm gonna tell you specifically about a three-phase model associated with external aid selection, design and implementation that I researched and created and we're gonna talk a little bit about what that looks like, and then finally, we're going to list considerations for implementing external aids for cognitive deficits commonly associated with traumatic brain injury and dementia specifically. So let's get started. We'll talk first about kind of what cognitive deficits might exist that could impact functional independence and why someone might consider external aids as the appropriate rehabilitative method. So first off, what do I

mean by cognitive deficits? Well, depending on which study you read, which textbook you read, which link on the internet you find, you're gonna get a different definition of what this means. You'll see here that I've outlined nine different components of cognition. The first eight here are actually adapted from McKay Sohlberg's definition of executive functioning. So what I like about her definition is that it really breaks apart different components of executive functioning into discrete tasks or discrete skills, so that we aren't necessarily as therapists going to say, I'm working on executive functioning, but we can more pinpoint maybe what the particular issue is. So when we talk about individuals that might need external cognitive aids, it could really be for any one of these different areas of executive functioning, but probably what comes to mind the most are things like planning and organization.

However, I also kind of combined the very big ideas of attention and memory coming into play here. So traditionally, we may think about external cognitive supports being more appropriate for people in maybe post acute or later stages of rehabilitation, where we might get to working on executive functioning deficits. However, individuals in more acute stages that might be showing impairments in attention and memory primarily, are also potentially really good candidates for use of these aids and we'll talk about kind of where you might make different considerations depending on the characteristics that somebody is displaying cognitively.

When we think about how to support these cognitive impairments in individuals with acquired deficits, we have a lot of different options as rehabilitation professionals. I kind of couch our different rehab options in four main categories, one being personalized education. So talking to the client about what their impairments are, what a brain injury is, what a stroke is, what a brain tumor is and talking about how that diagnosis or deficit might impact their ability to function. We also might decide to engage in direct or restorative intervention approaches. There's not a lot of great evidence to support direct intervention for individuals with cognitive impairments,

except maybe in the area of attention. So although direct intervention and drill and practice is super appropriate for a variety of different areas of our professional scope of practice, it doesn't really lend itself well to cognition. So actually, these last two areas here, compensating for impairments and increasing self-awareness and metacognition are really were the bread and butter of our rehab efforts are gonna lie for individuals with neurological deficits and that's what the literature really supports in terms of the most effective practices as well.

Compensation can mean a lot of things. It could mean that you're teaching someone to use an internal memory strategy, for example, but in this case, we're gonna talk specifically about how compensation for cognitive impairments can be achieved through the use of external aids. I wanna point out right here and going forward, that external aids doesn't always mean technology. So I kind of couch those as two different things. Assistive technology may be appropriate for some people and I'll tell you a little bit about for whom and when technology might be appropriate, but really, the idea here is that we're talking about anything that's outside of the person that they can refer to and use and engage with to hopefully promote success and work around some of their challenges.

So we're gonna focus there primarily today. So what are some of the rationales for choosing compensation as your rehabilitative method for cognitive impairments? Well, we have seen a lot of attention given in clinical practice and in research that talks about external aid use in a variety of ways. So everything from writing down a to-do-list to using a full on daily planner, to even using something like a photograph to support your memory, and really what we know if we kind of combine all the literature that's available is that the use of these supports really can help foster increased independence, which is always our goal of rehabilitation efforts, especially with adults, right? And in 2011, Cicerone and his colleagues talked about really what cognitive rehabilitation should look like and in their literature review they talked about again

direct attention training. So we can do some of that deficit type of rehabilitation for attention. We wanna make sure that we're thinking about memory and we wanna think about metacognitive strategy, but the big part was all of those efforts should really be coupled with the use of internal and external compensatory supports. So that's really the crutch here.

As I mentioned, in the literature about what the driving force should be behind our rehabilitation efforts. If that isn't enough for you, really what the takeaway message here is that the most efficacious and important clinical approaches should use the combined use of support materials and external cues. So these support materials are hopefully these external cognitive aids that we're gonna talk about designing, selecting and helping our clients implement, but also when we think about the use of external cues traditionally we might be thinking of the cues we as therapists might provide people or maybe what a caregiver might provide, but maybe it's possible that the support materials themselves could serve as the external cues.

I'll tell you a little bit of some of the features of some of these materials that might best support cognitive use and independence and some of that embeds external cues right into those systems. So we can kind of kill two birds with one stone here and make sure that we're selecting aids that are going to support these efficacious and important methods. Another thing for us to consider is looking at kind of the expert recommendations about rehabilitation and cognitive therapy. In 2014, there was a series of papers published called the INCOG recommendations, and if you haven't read these papers, I highly suggest at the very least looking at the abstracts because what they are, are a series of very extensive reviews of the literature that focus on variety of topics. So the one that I have referenced here for you is about cognitive communication impairments. There are also specific pieces of literature on attention and processing speed and memory. So there's different areas, but this cognitive communication one talks about kind of four general ideas that are going to enhance

therapy, and it starts with considering who the person was before their injury or before their diagnosis. So considering premorbid status. It also talks about the need to individualize goals, skills, therapy approaches. It discusses specifically training and assistive technology use, or if we can think of it just external aid use in general, and it talks about wanting to do all of this in a context that doesn't require generalization. So if we can make our therapy approaches functional to begin with, we don't have to worry about whether those techniques or those gains skills will generalize to real life. So I look at this and I say, "Thanks, Leanne, that's a lot of really great information, "but it's kind of hard to achieve all of this." And so, in practice, what I find myself looking for is ways to more concretely achieve these different aims. So when we think about what that means for external cognitive aids the idea here is really that we wanna think about what the functional impact of these materials and aids can be.

So what are these systems or materials actually gonna do to support the individual in their daily living? There may be that there's multiple strategies or supports that we want to teach people. So we might have to focus our intervention efforts on thinking about which materials might be helpful in a variety of situations. Maybe what the person needs in their home is vastly different than what they need when they're attending a medical appointment and they need to talk about those kinds of things versus being in the home and talking to somebody about maybe daily needs or personalization and social skills, things like that. We also wanna think about how we can personalize these materials.

So not necessarily a one size fits all approach and we wanna make sure that we think about how to use these support systems in a variety of different ways. What I like to think about when I think about the impact of external cognitive aids, is that they really can be brain prostheses. So just like somebody with maybe a limb impairment would rely on a prosthetic device, these external aids can serve as a prostheses for your brain. So it is there to support and be something that an individual can rely on to

participate fully in their everyday world. Let's talk a little bit about what we currently maybe do in practice. One of the things that really struck me and why I kind of started pursuing this line of research when I got a PhD and started doing my work is that I recalled my first experience as a master student in inpatient rehab.

So I was lucky to get three months full time in an inpatient rehabilitation unit that was primarily associated with stroke and traumatic brain injury, some spinal cord injury, and what happened in that inpatient rehabilitation unit is that every single person that we had any cognitive concerns about was given a one subject spiral notebook, and that spiral notebook immediately put in one little page about biographical information, one, the monthly calendar, a list of therapies, maybe some contact information for people and like a routine log kind of thing, and we did that regardless of who we were seeing, what their impairments were and why. It was just kind of the support that was put into place in that setting, and I started to really think about how much adaptation that particular material required from me as a therapist when I was working with different people, and I remember myself trying to rely on all of my techniques that I thought worked for me.

I was circling different things in that aid, I was highlighting things, I was drawing arrows to things, anything I could do to support the person, and I realized I had absolutely no evidence to support those decisions. I was doing that because I thought it might help. So I really started to dig into this literature and found that mostly what we know is that an external aids work, but we don't really know how they work, or what parts of them work, or why they work, or when they work. We really are using the resources that we have available to us as clinicians that might be the most efficient and easiest, that might be part of the routine in our setting, that might be based on our own experiences, but we really don't have a lot of literature in the how to do these external cognitive aids. So that's a lot of the motivation I had as not only a clinician, but also as a researcher to try to figure out what I could do to answer some of these questions for

myself. So one thing that you can start with is thinking about some theories that are available regarding technology acceptance. So what I mean about technology acceptance is not necessarily the same as we might think of in rehabilitation, or some of the literature we have available to us for augmentative and alternative communication technology. Really, if we think broader, we can get some information about why people decide to adopt a specific kind of aid or technology, and potentially why they abandon different systems, and one of the things that we know is regardless of kind of a theory that you tag on to, most of the ideas here have to do with some sort of social validity. So what I mean by that, is does this system actually match what the person needs in their life?

And is it something they can easily use based on the things they need to do? So when we think about selecting a support for somebody, we as the designers or the people potentially making that decision of what's gonna be best, need to think about what the components are that are gonna match to our individual users' strengths and challenges and really, we need to make this more of a phased approach rather than a simple selection and implementation process.

Well, so how do we go about doing that? There are a lot of resources available to help us figure out how to do this. One that I would be remiss if I didn't discuss is something called the matching persons with technology process. This is not something that I created, so I'm definitely not gonna take credit for it, but this is something that I rely on a lot is motivation for how to adapt strategies to different populations that I work with, and the idea of the matching persons with technology process is that it's a very systematic but personalized approach to gaining information about the individual and trying to match them to features of technology that would be most appropriate. So I love this quote from their website. It says, when matching person and technology, you become an investigator, a detective. You find out what the different alternatives are within the constraints. So it's really a very iterative process. I've given you the website

here and I'd be happy to take us there for a minute and show you kind of what this looks like. So I am going to share my screen here and pop over to the website. Everything that I'm gonna talk to you about today is publicly available. So when you go to the website that I provided you it takes you right to a homepage about the Institute for Matching Person and Technology, which is really cool, and on this website it gives you a lot of different sub links that you can go to. It provides you with information about the research that has been done to create this method. It tells you some of the rationale behind using this, there's even videos to walk you through the process, but one of the things that's most beneficial about this website is the forms and the workbooks that are publicly available to you, and in a few minutes I'm gonna talk to you about what some of those forms are, but I wanna point out that all of this was really started by a woman named Marcia Scherer and she is an editor of a journal called Disability and Rehabilitation: Assistive Technology and this journal is very helpful because it's focused on this kind of work.

So if you're finding that you're feeling like you don't know a lot about this area, a good place to start might be that journal and also this website. So as I mentioned, there's a lot of materials that are available publicly for you, and in a second, we'll talk about specifically two of them that I would love to highlight. So let's go back for a second to our slides and continue on with some of these particulars and we'll circle back to this matching persons with technology process.

So because of this process that does exist, I started to realize that maybe I could take some of the spirit of that process and see if there was a way I could really focus it to individuals with acquired neurological deficits. So in some work a few years ago, I started to look at what a process could be for evaluating and implementing an external cognitive aid. So some of the work that I'm gonna talk about specifically starts with individuals with traumatic brain injury, but I feel that this entire process really can be matched to a variety of individuals. I've been doing a lot of work with people with brain

tumors recently in my clinical practice, and this idea of this three-phased approach works really well for this population also. So I'm gonna talk to you today about these three different phases and kind of give you some hopefully, particular takeaway items that you can use to actually facilitate and complete these different phases of the process. So let's start first with figuring out what the needs of the user might be. So what our evaluation might look like, what some of the methods are that we could use to evaluate people, and how to figure out what we're trying to support. So within this there's kind of a variety of things that I recommend that we do. So the first being completion of an in-depth case history.

Obviously, some of the individuals we support may be better historians than others. So an in-depth case history may be easy to procure or it may be quite difficult. We all know that when we review medical records there is a wide range of the specificity and detail that is provided in those records and we may need to rely on the individual or I'll talk about some sort of other informant to help us gain this kind of information. We also wanna figure out how we can definitively and objectively determine the client's strengths and weaknesses.

Some of this could be self-report or symptom checklist, but relying on the individual with the impairment may not necessarily give us everything we need. So we may wanna think about alternative methods of getting that kind of more descriptive information, and then we wanna figure out what the client's goals are to promote their independence, to improve their functioning, and I'm gonna tell you about a way to do that called motivational interview. So let's talk about a needs assessment first, from the view of you, the provider. So really this could include anything in your typical assessment battery, depending on your setting, maybe protocols of your specific institution, may be dependent on whether you're working with someone in acute versus chronic stages. This is gonna vary a little bit. So I haven't given you a ton of particular suggestions for how to evaluate your client, but I will tell you that the use of

standardized measures that are publicly available to inform us about the potential benefit of external cognitive aid us is maybe easier said than done. So there are a variety of standardized assessments available to us when we are evaluating cognition. Those can be very beneficial to gain quantitative maybe decontextualized data, but they may not inform us about functional performance. So we also really wanna make sure that we can consider the strengths and challenges of our clients in dynamic ways. So maybe through trial and error of some of these different aids and systems. Maybe we wanna make sure we look at them outside of the context of a therapy room. So at all naturalistic, and I'll tell you about how I do that in my care method. So another thing that we can look at from that matching persons with technology assessment process is actually something called a technology device predisposition assessment. That's a really long phrase for just something that basically, allows us to consider the user's abilities across a variety of areas. So how you gain that information might look really different. Maybe it's because you know the person so you can answer a lot of these questions.

Maybe it's bred out of your standardized assessment, or maybe you include the individual in trying to get some of this information, but the idea here is that you don't have to think about what all the potential impacts of technology might be. This is a prompt. So it asks you about well, social skills of this person? Could they appropriately use systems in a variety of different ways? Is social skills gonna be a barrier, or do we wanna think about how to support them socially through the use of some kind of system? Are we talking about that this is gonna have match vocational needs potentially? So are we thinking about work, or school, or something like that? What is the person's desire to use technology? Depending on the person, they may or may not be interested in technological processes, but the overall idea here is you look at how much any of these items that they are asking you about are either disincentives to technology use or major incentives to technology use. So let's take a second and look at this particular form just so I can give you a little bit more of an example of what the

different prompts are for you to consider. All right, so this is what the predisposition assessment looks like that you as a professional would potentially complete, and if you download it, it is a really easy to use fillable PDF that of course, you could just use paper pencil or you could use electronically, and it asks you many, many different questions and kind of helps guide you through, as I said, a variety of areas. So it's going to talk about, like I mentioned, desire to return to pre-injury roles and responsibilities, such as school and work. It's going to talk about potentially how the person feels about themselves, what some of their self-esteem is or coping skills, which might tell you a little bit about how motivated the individual might be to use some sort of external aid.

As you can imagine, if somebody has poor self-awareness or poor self-esteem, or isn't really that motivated to be independent, they're not likely to use one of these systems or aids anyway. So we wanna take all of that into consideration and this kind of guides you through. It's two full pages. The first page is really about some of those global areas and then the second one helps you kind of think about what the person's current level of skill is that may match better to a particular area or a particular type of aid than another.

So for example, a lot of the people we work with might have physical or sensory demands that might limit their ability to engage with technology or engage with a particular aid. So let's say we're thinking about somebody with visual problems, we might have to consider size, color, background, things like that. We might be talking about somebody with literacy struggles. So we probably don't want to use something that relies on written words or text very much. So this really guides you through our process to kind of have a starting point of what to think about as the professional. So I really like this as a way to get going in the process for yourself, and try to figure out what the individual maybe bring to the table that's going to facilitate success with using these aids or not, potentially. The other thing that we wanna do is gain

information from the consumer themselves. I mentioned that self- awareness might be a really big barrier and that's an important theme for us to consider. Obviously, many individuals with acquired neurological disorders are going to show challenges in self-awareness. It's almost a hallmark symptom, for example, of traumatic brain injury, certainly people with right hemisphere dysfunction, individuals with dementia do not have a very clear sense of self, or awareness of their environment or their needs. So that is something we're gonna have to really make sure we incorporate into our therapeutic models, but also that we acknowledge up front is something that may be important for us to consider when we're selecting the appropriate support for these individuals, and what we really wanna do is make sure that the needs of the individual, so what we maybe determined as the needs and what they tell us the needs are, actually match their preferences.

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Though, I don't know about you, but I don't really love doing what other people tell me I have to do, right? So if it's always this expert model in therapy, where we're the ones making the decisions for them, the likelihood of them really taking that and running with it in their daily lives is not gonna be very high. So their preferences, although they might not have the best awareness of their deficits and their challenges, their preferences are going to be key for us in figuring out how to match them. So another support that's available that I'll show you more of in a second is something for the consumer to fill out if they are able.

Obviously, there's gonna be some barriers dependent on level of cognitive status and maybe acute versus chronic stages and things like that, but the idea here is that you might prompt the individual to give you information about how they feel about using different technologies. So what have they used in their past that they feel has been successful? How do they feel about frustration levels, maybe, with using technology? Maybe some of you feel that you're really good at learning a new system, or you're a tech savvy, and there's other people that aren't going to be. Maybe you feel like there's

certain types of technology you're good at and not others. So this survey of technology use allows you a systematic way to get the input of the individual. So let's take a second just to look at it and talk about maybe some of the adaptation that we might wanna do if we're working with somebody. So I mentioned that dependent on the user and their abilities, that they may be able to fill this form out with more or less independence. So if this is not something that somebody can do on their own, it may be is just a way to guide some interview for you and I'm gonna talk about interview technique in a minute that is helpful, but that technique is really open-ended. So it may be that you're just not getting the information you need from somebody, and you want to get more focused kinds of questions. So one thing I love about this is that it prompts you to consider a variety of different kinds of technologies, everything from VCR to a bank ATM.

So really broad conception of what technology might be and then as I mentioned, it's really just categorical and the statements here are a little bit more concrete and to help guide the consumer through filling this out. I also find that if you are patient or your client for some reason cannot do this, it's possible for an informant or somebody else to support completion of this based on what they know about the individual, okay. So it talks about typical activities the person engages in, how social they are or some of their mental health concerns, and you get kind of an overall score to help determine if somebody has a positive attitude towards using technology, whether they're neutral, or whether they're negative. So that you know whether technology is maybe something you want to pursue or you have to think differently about how to use maybe external aids in a non-technological way. So again, a helpful starting point for you potentially, to gain some information that you may or may not get otherwise. I mentioned that a person who may be really helpful in this is some sort of informant. I can tell you that there are a lot of people that I have seen in acute care or inpatient rehab that are not good historians and cannot necessarily be fully relied on for helpful information and making these decisions. So we may need to consider somebody else. One of the

things that is a huge barrier to this is that an informant may or may not be available for all people. I can think of a lot of individuals who came into hospital settings with non-traditional backgrounds. So maybe they don't live at home, maybe their living situation is very unstable, maybe they don't have a support network, or they don't have somebody to rely on. So we may need to do our best here, but the idea is that this individual may be best suited for helping you obtain an accurate history, but also to make suggestions for future supports. I highlight and emphasize the word suggestions because ultimately this person is here to provide you with ideas, but not the person I wanna fully rely on. There are some times in my therapy, particularly when I'm working with adolescents and young adults, where I asked the informant to leave because they may potentially be providing too much information.

So when I'm trying to find out what motivates the client that I'm working with, I sometimes ask the informant to provide the information maybe through a form, or to fill out a questionnaire or something so that I may be getting that information, but they aren't dominating the decisions that are being made. So what do I do as a really generic method to gain information about my client and their preferences in order to make goals? Well, I like to use a technique called motivational interview, which I'm sure many of you have heard of.

One of the really cool things about motivational interview techniques is that they were not at all created for use by people like us. Originally, motivational interview was actually something used very commonly in the medical field for figuring out how to support patients with different diagnoses. So if you look up the literature on motivational interview there's a lot of stuff about working with people with diabetes, for example, how we can figure out what their goals are, what their needs are, a lot of it has to do with medication management, but the idea here is that a motivational interview is kind of just that. It's a framework that ideally is going to facilitate a collaborative process between you and your client, where you try to obtain information

from them about what they think their challenges are and what their goals are, and then try to work together to form that into something that is realistic and manageable in your therapy. So I like this a little bit as a clinician because sometimes, I'm off the hook for trying to really create the goals. A lot of the goals come from my clients and what they're interested in and what really they think their needs are. So let me tell you a little bit about what a motivational interview looks like if you're not familiar with this. So the idea of it being really open-ended is what sparks kind of the spirit of this technique. So what you do is you really start off by asking a very open generic kind of question, like why are you here today? What can I do for you?

What can I help you with? And you see what the person says and maybe they start talking to you about a particular item and then you help them kind of focus that. So you say, okay, that's interesting. Tell me about why that bothers you, or you say something like, okay, you said that you're having trouble getting things done, how do you go about completing tasks in your daily life? So it's still really open-ended, but you're kind of narrowing the scope for them. One of the really important parts about this is the validation of your client and what they're experiencing. So very frequently, you want to reflect on what they're saying and help them understand that what they're going through is a real thing.

So you say things like it is really hard to stay focused for long periods of time. I have that problem too, or something like that, and then at the end you wanna make sure you really summarize and synthesize what you're hearing them say. So I gave you an example in the slides. I don't need to read this word for word or anything like that, but I do wanna just point out that it can be a really easy, smooth, natural process to guide the individual and like I said help them narrow down, and I find that this works with people even that have really impaired self-awareness. I find that this works with people who we have concerns about their cognition or their ability to engage because, honestly, whatever they tell us is their current version of reality. So that goes back to

me gaining information about their self-awareness, about their current cognitive status and it's really an informative evaluation tool, not only something for me to help prioritize and create goals, but really something for me to, in a more informal way, evaluate where they are cognitively. So it's a technique that I would highly recommend. You can take specific trainings on motivational interview and become like a certified experts in this, but there is plenty of literature out there about how to go about doing this and how to implement it into your assessment process for a variety of different kinds of patients. So let's talk about a subsequent phase here where we figured out maybe what the challenges are of the person, we've utilized a variety of different techniques and now we have to figure out what kind of aids are gonna be beneficial for this individual.

So in this space, we wanna make sure that we talk with our client about all of the different options that might be available to them and we wanna talk about things that they see as favorable to those potential options and things they see as negative or barriers to those different options, and then ideally what we do is we participate in a feature matching process, if that term is familiar to you from the AAC literature, to identify what we think are going to be the best or most preferred systems to select for the time being. Here's an example of the options that I often go through with my clients and what I've used as a starting point in research.

So one of the things that I really find important is that we include both no-tech and high-tech options. So you all probably use a variety of methods in your daily life. How did you remember that this webinar was happening today? Or you remember that you had to pay a bill or call the doctor. Do you do that on post-it notes? Do you put it on your calendar? Do you write it down? What do you do that supports your ability to function in your daily world? It probably includes both of these things. So I literally have this stuff available and sitting out on a table and I talk to them about what all these different things are, and I ask them to tell me about what they think pros and cons

would be, what they like about certain things, what they dislike, and then ultimately, I try to encourage my client or my patient to select two of these that they're ultimately going to trial. So one of the things that we need to be careful about is that some of these systems or options might have way too many features. So here's an example, on the right hand side of a screenshot of my Google Calendar on any given day. You'll see I'm the kind of person that will color code things, you'll also notice that I am booked from start to finish in my day and I often have overlapping kinds of things. This type of system is highly inappropriate for most individuals with neurological disorders, right? So unless they were really familiar with this kind of system before, we might want to, kindly, shy them away from some of these options that might require a lot of new learning, or that might have a big kind of curve to get them started and going. Sometimes the best system is the easiest system.

So keep that in mind that we don't necessarily wanna go to the one with the most bells and whistles, but maybe a whiteboard will work just fine and that's where we need to start, okay? But again, the goal here is pick two of them and we're gonna kind of move forward. So when I do this work with people, I talk to them about, as I mentioned, the pros and cons, the likes and dislikes, and here I have summarized what I hear from people with neurological disorders about different options, and what's interesting is you can actually learn that there are trends from people about the components of systems that they prefer, not necessarily that everybody decides they like post-it, or they like using the Notes app or something like that, but that there are kind of generic features that seem to be preferred and seem to work well for this population. One of them if you're going the technological route is the ability to have information synced across multiple devices. One thing that I hear people tell me a lot, especially if they have neurological issues is that, oh, they wrote it on their phone, but then they're sitting at their computer and that same information isn't there, or they wrote it down in their planner book, but then they forgot to bring that book with them so then they don't have any of that information. So the availability of accessing it and having it all be across

multiple locations is very helpful. Another thing I briefly mentioned is visuospatial appeal. Now, some people are really gonna enjoy some of the options in terms of making a visually complex system like color coding. For other individuals, that's gonna be a huge barrier. So we wanna make sure that we match the visuospatial appeal to the particular user, but that's something that you really wanna consider as a component to the system. We also wanna think about accessibility. One thing that comes up a lot you'll see here is a reminder.

So people talk to me a lot about well, okay, I wrote it down, but I don't actually remember to do it when the time comes. So in electronic systems, what has been maximally effective for these individuals are things like pop-ups. So you maybe do this in your calendar, it happens to me all the time. I'm sitting at my desk, I'm working away at something and thank goodness, a little thing pops up in the corner of my computer to tell me I'm about to give a talk in five minutes, right? Because otherwise, I might not remember to remember that thing and so those reminders can be really valuable and that's an example of how we're combining the support system with the external cue. The external cue to use the support is actually embedded into the system. So those reminders can be key.

Another thing that's very important is that a lot of these individuals are going to need help remembering the details of what it is they're supposed to be doing, but having things be really overcrowded is also not good. So sometimes a dynamic system could work, maybe if they use a monthly calendar just to write down that they have an appointment. So it says, doctor's appointment on Tuesday, and then maybe within that system in a different location all of the details are there about time, location, who it's with, et cetera. So that they're not necessarily overwhelmed by what's going on within the systems. So what this tells us is maybe some of the types of content we also wanna make sure is in there. So when we talk to people about what their needs are and we look at what the needs of people with neurological disorders might be, we not

only wanna consider the format of the system, but also what is in it, the information that's in it. So here's a list for you that could be kind of helpful. I mentioned that this is maybe a little bit generic, right? So you're gonna want to personalize this. Maybe somebody doesn't need a medication list, maybe somebody really needs a medication list. So starting with a big template might not be great unless we can really personalize it. One of the things that I try to remind myself as a clinician, is that cognitive aids can be prospective and retrospective. So what I mean by that is that they can not only be useful to help somebody plan and organize future events. They're also useful as some way to remember the past. So it's nice to be able to have it be kind of what I think of is a living document that grows with the person and helps them move into the future, but that they can rely on if somebody asks them a question about their therapy appointment last Tuesday, right?

So it kind of can serve dual purpose of that prospective and retrospective aid and that is going to be more or less easily accomplished, depending on the kind of information you have in there, if that makes sense. Okay, so let's talk about what we do once we ultimately figure out that an individual likes these aids that maybe we're recommending, maybe we guide them to prefer, or like a particular aid based on what we know, and then we wanna actually do something about it. So monumental to the success of these aides is going to be actually trying them out.

So the most important phase here might be the implementation of them and actual trial periods. So what do I mean by that? Well, as you probably know, if you have any experience with AAC, you can't just hand somebody an AAC device and say, "Go communicate", right? We have to actually train the person. So we need to do that here. We can't just implement something or pick something and then send the person on their way. We also wanna make sure that what we've selected actually works for the user. So we need something that allows us to make adjustments, to change our mind, to realize that maybe something didn't work and to go back and figure out a different

method. So let's talk about how we do that. Well, if I'm gonna train somebody on using a particular support system, I need to train them on a variety of things. So I need them to learn why the system is helpful, that's some of that education and that awareness and metacognition. I also need them to learn how it will help them. So in what situations is it gonna be useful? What's it gonna do? Is it gonna support your memory? Is it gonna support your communication? And also when to use it. Without this background training, the likelihood of them pulling it out in the right time and engaging with it is going to be very low. So we have to really start here with our therapy on do they know what these things are, and what they might be used for? So we might do that through helping the person practice.

So maybe there's some role-play scenarios we can do. So we want them to become really fluent in the use of these supports. Another thing that's important is teaching them maybe the antecedents or the triggers for when to use it. So maybe we find that you've hit the jackpot and there's a support system that they can use really for any situation, that's great, then we wanna make sure we are actually training them to use it in any situation. There could be others, though, that are only really gonna match to a particular context or situation and in that case, we wanna teach them what should trigger in their mind to have them say, oh, I'm actually struggling with this particular task, I'm supposed to use my aid for that, okay.

So we wanna teach them about what those things are to help them remember to remember the strategy. We also wanna make sure that we can do this practice in a really real life kind of functional way and I'm gonna tell you about how you might do that in a second. When I think about what this means for me as a therapist, and how I actually write goals and take data on it, it gets a little tricky, because it's one thing to say we'll use an external aid to complete a task, but we also need to show that we are doing something that is goal-oriented, that is reimbursable in our therapy, that is going to move the person towards that long-term goal of independence with these systems,

but maybe needs to start in something that might be kind of hard to document. So one way to support this is to figure out the kind of data that you can actually get when you're doing trial periods or teaching somebody about the support system. So some of the data that you could take could be about the individual's ability to recall or know what the strategy is. So at an appropriate time, given a particular situation, are they able to know that a strategy might be helpful? Okay, that's a first step that could be a goal that you write. A next step could be about are they able to use it, okay? So not only do they know when and what it is, but do they actually initiate use of it? Do they use it appropriately? And do they do these things with decreasing support? So all of those different components could be embedded into ways that you write these goals and ways that you actually take session data to make this something that is reimbursable and a skilled service on your part.

So we wanna think about that 'cause the reality of it is that we wanna help these people, but we need to be able to make sure that we're showing the impact of our therapy. One thing that I love as a therapist is the idea that there could be strategies for me to teach a strategy. So there's something called the TEACH-M approach that I just wanna very briefly tell you about, and this is an idea kind of a systematic way to teach someone any kind of strategy.

So this counts for some sort of cognitive strategy, use of an external aid, whatever it is, but probably none of the words on here are unfamiliar to you, but what this does is it helps you start from a very distinct process all the way down to helping the person implement it on their own. One thing that I wanna point out is at the bottom here you'll see that it's called the TEACH-M, because that M component is back to that idea about self-awareness and metacognition. So what does this person actually know about their strengths and weaknesses? Do they know that using an aid is helpful? Do they know when to use it? Things like that. So we wanna always be incorporating that metacognitive approaches and self-awareness training when we're helping our client

use these external supports. Another strategy that I like is thinking about this and kind of a progression of your client skill set. So this also something that comes from McKay Sohlberg's cognitive rehabilitation textbooks and she talks about an idea that you might first start with a client and helping them acquire knowledge of the aid itself. So I might start with things like, okay, here's your book. Can you tell me where you'd find information about your therapy schedule today? Can they navigate through the book? Do they know where it is? Then maybe you get a little bit more generic. Oh, I feel like you're having a problem remembering what you're gonna have to do tomorrow. Is there something you could do to help you? And can they navigate to find their calendar or something like that, okay? So really getting them used to and acquiring the skills and knowledge about their aid that they're gonna need to be successful, then maybe you can start writing application goals or engaging in activities that help them apply it, but still in a very structured way.

So role-play here can be helpful. I have used nursing staff, other therapists, PTs, OTs, rec therapists in this stage a lot because they understand what we're doing when we're working on these different things and they know the kinds of questions to ask and how to support someone through a guided interaction. So multidisciplinary care can be really helpful here in this application stage, while the person is still in therapy, and then hopefully, they get to an adaptation stage where they can use it on their own, in their own environment without any help from you. That might be a little bit wishful thinking, but hopefully, they get there, right? So if you're struggling to figure out again the particulars of how to really do this, or how to justify this, you may consider writing goals or implementing activities across these different stages. What I really find helpful is the implementation of short-term trials. So what I like to do, as I mentioned, I have people try out two different things. I like to give them time to have one trial phase, where they use that particular system, then I have them switch systems and try something else and then we do a big debriefing. I'm gonna show you some data in a second about what I gained from that, and I like this because I again rely on the world

of AAC and think we would never find a device without a trial period, okay? We would also never select a system without first comparing it to other ones to ensure that it's the best one, and we don't wanna select an AAC system for somebody unless they got to try it in their own world and in their own life. So here's actually how I do these trials. I give my clients a list of tasks that they could choose from and they're going to select some that they're gonna do over, however long my trial period is that we decide and they are going to use only the aid that we're trialing to help them complete these activities. I used to do this where I told people what to do, and then I really changed my mind about that in my research because I felt that the value of letting the client choose activities is not only gonna enhance their motivation to actually complete that task, but it's gonna more closely mirror what they might do in their real life. It's not up to me to decide what kinds of things they need to do to be successful when they leave my office, it's really up to them. So I like having a menu available.

I ask them to select maybe five things, let's say you're gonna have them do it over a week long period, have them select five things that they try out to use that aid with. Let's say you're an inpatient rehab and you plan on seeing the person tomorrow or two days from now, then maybe you say, all right, I want you to pick two things or one thing that I want you to do and let's see how it works. So again, two different trial periods where they pick things from some sort of menu, or you co-decide, co-construct what those activities are gonna look like. So it's interesting. I've given you some example data here from three different people who all showed very different results in their trial periods. So on the vertical axis here, we're talking about accuracy. So the number or percentage of tasks they successfully completed during a trial period, and the gray represents the first phase, the first system they tried. The bright red represents the second system they tried and then the third, the deep red, actually represents prior to starting any of this, I asked them to predict how many tests they're gonna remember. So back to that self-awareness piece, and again I chose this data because there's three very different profiles here. You'll see for the first individual, the two different

systems were actually almost identical in their accuracy. So they maybe did one more tiny little part of a task correctly in the second trial than they did in the first. So those systems were really both relatively beneficial, but also, if you look at it 50 to 60% accuracy of completing tasks, isn't that great? So we maybe wanna consider something else too, but look at that compared to that individual self-awareness. They told me hands down, I'm gonna do all of this completely correctly, 100%, okay? Participant two has the total opposite. Their self=awareness is poor because they overpredict problems. So their projected accuracy was 50%, but they actually performed really, really well when they had these supportive aids, and then the third person, roughly comparable in all of it.

So you can see that we get actual data about how people do and we can kind of help this to guide our therapy. So I say what we learned from the data, but what I really think about is what we as clinicians learn from these trial periods. Well, this is an example of that dynamic assessment I told you about, right? So we probably aren't going to easily find standardized assessments that are gonna mimic the use of external aids. So by doing these trials, we actually get to see how our therapy and how the things that we're considering change performance in our client. That's the definition of dynamic assessment.

So you've done that in a really easy way. I actually like that it also doesn't really involve much of our time per se. So we are asking the client to mimic some sort of independent completion of a task and from that we can see kind of where the problem is. So maybe the person tries some of these different activities, but they really struggle with the details that tells me something about how I might change the support that I'm providing them, or how I might help them focus in our therapy activities, or maybe it's that they literally took the thing home and never remember to use it, or maybe it sat on the side table in their hospital room and nobody ever looked at it, or heck, maybe they lost it, that's happened to me too, right? So it tells us a lot about where we need to

start in terms of either selecting a different type of system or engaging with that system in our therapy. So really it's the next steps for treatment. One thing I wanna really point out is how important it is to have kind of iterative review and adjustments. I took a picture of this because I'm gonna be really honest. This is the daily planner that I bought myself at the beginning of this year. I even went so far this year to try to buy these stickers that would help me visually point things out, plan ahead. I have not opened this, okay? So I bought all of this stuff and 2020 came and now it's almost gone and I have not used it once. So this is obviously not the type of system for me anymore. When I was a student, I used to rely heavily on my little book, and if I had lost my book my world would have been over, but now I am different and I have a different life that requires different things.

So this system doesn't work for me, and so we can't just pick something with our clients and pretend it's going to be good forever. We really need to keep adjusting and reviewing this kind of stuff, if we have the ability to in our therapy. So it's really continuous. Again, we also might wanna consider a hybrid of systems. So maybe the person is like that participant one where they were really comparable in the two methods, maybe they wanna use both and maybe they like them and they want to consider one system for a certain kind of thing, maybe for work, and another system for their daily life and their parenting needs or something like that. So we might wanna consider not just selecting one, ultimately, but we wanna review that and make some good decisions about it.

Okay, so in the last little while before we take questions, I'm gonna talk about now how to consider some of these ideas dependent on a particular population. So I mentioned in the beginning, it's gonna look really different what we do for somebody with dementia than traumatic brain injury, and why we might be suggesting use of external aids is going to also be different. So let's start in thinking about the question of to technology or not to technology. So a lot of us might initially go to age as a

consideration for making this decision. Age related factors are definitely there, but it is also a bit of a myth. So not all individuals that are aged or considered more on the elderly scope of things are unable to use technology. Some of them are very, very good at technology. So it's something we wanna keep on the table for everybody. I also have young students that attend my classes in our graduate school and they might be terrible at technology. So we don't wanna make an assumption. We also need to consider obviously cognitive status and consider the individual's premorbid abilities and desires. So I like this reference a lot because of the name. The title of it is does education help old dogs learn new tricks?

And I think about this in terms of technology a lot. I'm going to disclose about my father that he was a healthcare administrator for his entire career. He was a CEO and a CFO, and he's done a lot of different things, and that man could run a hospital, but he does not know how to use Skype. So I have walked him through how to use Skype probably 12 different times and he can't seem to figure it out. So he is an example of somebody that has a lot of premorbid skills and abilities, but maybe is not a good match for some of these technological ideas because the new learning curve is gonna be so high for him. What we do know is that individuals that are successful with technology or that use technology quite a bit, individuals both with and without disabilities, usually have characteristics such as younger age, male sex, white race, higher education level and those that are married.

This describes a very small subset of our clinical population, right? So not very many people that we work with are going to match these particular characteristics to a tee. So although this guides us a little bit about what research tells us in terms of success or use with high technology aids, we wanna not let this kind of bog us down in terms of what we're making considerations about. So aging and cognitive decline can tell us a little something too. Interestingly enough, more than 50% of older adults use some sort of cell phone or smartphone and a computer. So we're talking about elderly individuals

that are half of them pretty tech savvy, however much fewer of them use tablets and e-readers. Many of them actually use technology primarily for socialization activities. So texting with grandchildren, calling and emailing support groups or things like that with their friends. Older adults report a desire to use features such as alarms in their calendar in order to support their cognition, but barriers include lack of knowledge, negative attitudes, and some of those sensory and physical issues that we talked about. Imagine now that this is typical aging individuals, now we're talking about a neurological disorder. So these themes are actually pretty much the same as what we talked about earlier in terms of matching someone with technology.

So we're seeing this overall idea that technology could be helpful, but maybe not the best necessarily. This is gonna be particularly true when we think about the clinical populations that we support. Let's think about traumatic brain injury in general. Obviously, these individuals are gonna have acute and chronic symptomatology that would benefit from the use of external cognitive supports, and many of them have the goal of going back to the environments that they participated in before, school, work, their home life, things like that, but the demands of those kind of environments are incredibly high.

So we need to think about not only whether these supports might work for them, but kind of what this is gonna look like for the population. So one way that I would suggest considering is thinking about more of the acute stages for individuals with TBI, and in that stage, you might be thinking about aids that help with orientation. So getting someone oriented times four person, place, time, situation, and memory. So we know that memory impairments are not only common in the early stages, but also persistent complaints of individuals following brain injury. So consider how these aids could support orientation and memory when you think about content and type of support. We also really wanna be careful though, that we know in this population in particular, new learning is going to be a struggle, or think about your patients that might still be in a

state of PTA, post traumatic amnesia, meaning they're unable to lay new memories for a period of 24 hours. These aids could actually be really helpful right then. So right away in therapy, you could have things that are going to compensate for that inability to learn new information or recall newly learned information. Many times, people with TBI have very intact procedural memory or that non-declarative memory, but they struggle with the new learning and the factual kind of stuff. So consider selecting systems that are gonna help them manage those really hallmark complaints. Later on in therapy for individuals with TBI, we might be thinking more about executive functioning skills. So this is gonna refer to all of those areas I told you at the very beginning that are really gonna be simultaneous cognitive resources that are activated to solve everyday problems and engage in the everyday world, and so in more post acute or chronic outpatient stages, for example, with people with TBI, you may be thinking of supports that are gonna hit these higher levels, but early on probably not appropriate to be thinking of any of these kinds of tasks when you're selecting and implementing and training external cognitive aids.

So traumatic brain injury is obviously something that we hope will allow for rehabilitation. We hope that the impact of the injury is going to be lessened over time and not greater. We have to think a bit differently when we're talking about working with individuals with dementia, who we imagine are going to have a progressive loss of cognitive functioning at variable rates. So what we wanna do with this population is really think about one, that role of technology 'cause it's gonna be very difficult for this population to use technology as time goes on, but we wanna capitalize on the things they're good at. So I mentioned people with TBI are often really good at procedural memory and that's absolutely true for people with dementia. If you've worked with this population, if there is a magazine or something interesting sitting near them, they very well may rely on that procedure in their brain to pick it up and start flipping through it. Maybe they have not good literacy skills so they can't read any of it, maybe they don't know what any of it's for or why they're looking at it, but that innate skill is still there.

That's actually really, really great when it comes to external aids because one of the things we can make sure we do is keep these systems ever present. So I take a lot of pictures of clients that I see that I use in my classes, where I am putting their little memory book on their walker or their wheelchair, or sometimes I put it around their neck and I strap it to them, because if it's not in their immediate environment they aren't gonna use it. So we really wanna capitalize on that procedural memory of the availability of these aids for them. We're not gonna teach them necessarily when and how to pull it out and use it. Their skills are not gonna match that level of external aid use. Also, we wanna think about things that are really personalized, very simple for this population and that primarily focus on orientation.

So getting the person to reduce anxiety, to recall who they are, where they are, why they are somewhere, things like that. Briefly, I'm gonna just tell you about a little bit of literature available about using these memory aids actually as communication supports as well. So Michelle Bourgeois is somebody that you may have heard of that does a lot of work for individuals with dementia across a variety of different dementia types. This particular study is about individuals in the maybe earlier stages of suspected Alzheimer's disease, and what she did was she created memory wallets or little card books that included pictures and words relative to three main topics, family names, biographical information, and the person's daily schedule.

So very orientation-related and what they did was they trained some caregivers, to use these aids in conversation. So not only were they there for cognitive support, but also as a communicative support to enhance potentially engagement, back and forth turn taking, things like that. So what they looked at were these conversational sections or dyads between these groups of people, and actually, the availability and use of the memory books, increased communication abilities, surprisingly, with great amounts. So increased frequency of expressing factual information. So less confabulation, more on topic kind of statements, increased turn taking, so that initiation, that back and forth

was increased, when these memory books are present and the content was better. So less perseveration, less intelligibility actually. So the biggest thing that I take away from this is that they actually noticed decrease depression in people with dementia when these memory aids were available for them and subsequently implemented in conversational use. So just the availability of these aids for individuals with dementia is highly impactful. So I want you to think about some of the flexibility of these systems, not only for those cognitive impairments, but also other things that we might do as rehabilitation professionals such as conversation and communication. So let's talk a brief summary and then kind of open it up to questions in the time that we have left. So I've talked about a lot today and I wanna kind of just drive home some key takeaways and messages that the literature tells us and clinical experience tells us.

So of course, I hope that I've done a good job of explaining today that self-awareness and self-report is gonna be really important, but it really doesn't always mirror what is best for the person. So we wanna think about methods that we can use as clinicians to gain information from a variety of sources to make a really informed decision. We also spend a lot of time relying on our own experience in clinical practice, which is excellent, that is one of the three tenants of evidence-based practice from ASHA, for example, but that's only one of the three, right?

So we also really need some more research to consider what the best systematic approaches are. I've provided you with some ideas of how to be a little more systematic and intentional in assessing and implementing these systems with people and I hope you find some of that helpful. We wanna think about, as I mentioned, those components that people generally prefer, but also remember that that doesn't mean everybody is gonna to benefit from reminders or something like that, and we really wanna think about all of this as kind of that feature matching process. So what do you know as a clinician? What does the client think and what do they prefer? And then what can we rely on from the literature to help us support these decisions? Overall,

too, we wanna think about why we're gonna to use them. So I mentioned that some populations might have different kinds of needs. So we wanna select aids that are going to fit those needs, not only for what their suspected neurological impairments are, but also for where they are in their recovery. One of the things that I'm working on in my research right now that I haven't included here because I don't really have all the data yet is what about the systems are helpful. So I've actually done some eye-tracking research where I have presented different layouts of daily planners and I've altered the text in various ways, highlighted some of it. Made some of it bigger, bolded things, changed the font color to try to see what we can do to enhance the attention and memory of people with traumatic brain injury to different components of these aids.

So that's really where I see this literature going and the need for what to happen next. I think we have ideas of kind of how to go about the general process, but we're still really missing particulars about what these things should look like, and that frustrates me as a clinician and it probably frustrates you even from this talk as I can't tell you exactly how to create the best most evidence-based external cognitive aid right now, but hopefully, that's where some of the literature is going. So that we know that once we do have the right option that when we go to implement it, or we train our client on it, or we train caregivers on how to use it and things like that, we're really starting off on the correct right foot and that we've done our due diligence in the design and selection process in order to promote best outcomes. So there's still a lot of work to do to go backwards on that design process and figure out what is going to work best for various populations, but I think we're moving in that direction. So hopefully more to come on that in upcoming years. Okay, so I'm happy to take questions, I believe you have all of the references listed in a separate document for you to download, but they are here on the end of the presentation as well for you to have. So I tried to keep about 10-ish minutes left. You can please put questions in the chat and I will be happy to take them for as long as we have time. Thank you for listening today.

- [Amy] All right, thank you so much, Jessica. We really appreciate you joining us today and since we do have about 10 minutes left, I really do encourage everybody to think about what questions you may have for Jessica today and we will address those. We do need to make sure that we do reach the 90 minutes. So please feel free to ask any questions that you have at this time, and while we wait for those, I'm just wondering, Jessica if maybe you could address any, I don't know frequently asked questions that you might get about some of these different aids that you use and if you've given this presentation before there are some questions that you typically see come in.

- So I can't say I've given this presentation exactly before, but some of what I have been presenting in more recent years at conferences relate to some of that design kind of question, and I often get questions from a lot of researchers actually about how we're gonna figure out those design features. So in the world of AAC, for example, we have spent decades trying to figure out how to best design the systems and we still aren't really there yet, right? AAC is not perfect. We don't have the best language models that are created. Personalization is really key.

So people ask me a lot about how we can get there, and I think that I spend a lot of time trying to manage the decision as a therapist and a researcher about how much we need to personalize something versus how much time that takes to personalize something. So I want you to think about maybe some of the methods you can do that you might consider low-hanging fruit. So like I mentioned, maybe starting with a template, but then quickly trying to make some of those changes or decisions, or maybe what can you gain from an informant that they could help you. So maybe you wanna include pictures because that seeming to be really important and helpful, and then you actually are going to ask somebody else to bring in pictures for you and place them in the book, but you already had spaces available for those. So hopefully, what we can do is try to more specify what the design needs to look like, but figure out ways to kind of decrease the clinician burden 'cause I know that's a really big factor here for

a lot of people. Okay, we have a couple of questions. So Angela writes, how do you use cognitive aids when you're implementing telepractice? That's a really good question and something that obviously is on everybody's mind right now. I think that I actually truly believe that particularly for people with traumatic brain injury, telepractice could be a very helpful tool for us to rely on in therapy, and the reason being it actually allows us to engage with the individual more in their natural context, right? So you could think maybe a little bit more, I guess, globally about what the goal of the external aid is. So maybe an initial place to start is that you want the person to be able to use their aid to walk them through the steps of accessing your remote technology that could be something.

Maybe what you do is you try to have them use the aid to tell you about things that have happened in their life in the last week that you wouldn't know about otherwise. Maybe it's something about if the person is good with technology, you can have them engage with you in like Google Docs or something like that, that could be maybe more dynamic. So I think the principles of what we might do in our regular therapy still are going to apply here, but what we need to consider about is just a different method. So I'm lucky that I am in a university setting. So one way that I might think about how to implement something else here is could I bring in another person. So maybe I could bring in a student into the session, or maybe I can bring in a caregiver, but they're accessing technology remotely and that's where I could do maybe some role playing. So I could ask them to tell us about what happened to you this morning. Is that anywhere?

Do you have it written down? Let's plan our next session. What do you need to write in your planner in order to make sure that we show up on time next time? So I think all of this is still kind of the same, we just have to think about that barrier more from our end and technology rather than from our therapeutic techniques per se. Okay, here is a question about how successful has AAC devices worked for non-demented geriatric

population? So I think it depends on what you mean here, Tamra. So I'm gonna make some assumptions about your question. So if you mean AAC and communication devices, then I don't know a lot of research about how that has... Communication devices have been implemented in geriatric populations that are not neurological, unless you mean people like aphasia and TBI. So, certainly, I've seen a lot of success of individuals with other neurological disorders or diagnoses using communicative systems even high tech ones that are older. If you mean AAC in terms of more just assistive technology devices, I think some of that literature that we have certainly supports that this technology can easily be used by this population. I have some clients that I see that maybe have a history of stroke and they might have aphasia, but that stroke was in their '60s and they're now 85 years old and they are working like champs using technology and engaging in the things that we work on in therapy through technology and using these aids and social media and things like that.

So I think it can be very successful, but again, really dependent on the particular user. Somebody has a question, is there a reference or link for a great template for a memory book for dementia patients. So Michelle Bourgeois actually has a textbook that is titled, I'm gonna not know it, but something about "Memory Aid Implementation "for Individuals with Dementia" or something like that, and it is a really great book because it gives you lots and lots of examples of these different supports that you might have available for people everywhere from like the signage that might be helpful around their rooms, to actual aids, how to implement pictures, the level of text that might be appropriate for these individuals.

It's a textbook that I always recommend to my students. It's kind of a starting point to get ideas. So I would recommend if you're able to procure some resources for yourself, that's something that I would recommend considering and any of her work actually, is going to have... She often gives examples of the stimuli they used in their studies in the literature, so in her publication. So if you look for her then that could be great. Okay, so

somebody's asking about the stages recommended by Solberg and colleagues for the external cognitive system. So yeah, that is the acquisition, adaptation and application stages. So those come from a variety of different places. So Solberg has some textbooks about cognitive rehabilitation practices were most of her kind of suggestions of this work are. So a lot of what she talks about is kind of good clinical application that doesn't necessarily come from like an experimental study. So her textbooks on cognitive rehab provide a lot of the information for you about kind of the process of selecting these aids and implementing them. So I would recommend some of those resources for you. Okay, let's see. Have you been successful at getting financial support for AAC in the elderly population? So yeah, I think when you're thinking about again, AAC, then you wanna consider why you're looking at that. So is it for truly a communication support? Is it that you're trying to have it do more than just a communication support.

So obviously, AAC comes in a variety of forms, everything from no technology all the way to, expensive, dedicated devices, and so some are third party payers have different recommendations, or I guess requirements for what they might fund in terms of that kind of technology. A lot of this may stem from what the diagnosis is. So individuals that have a clear cut diagnosis of aphasia, for example, may have a little bit of an easier ability to document and rationalize for the need for these kinds of supports than maybe some people who can't really show that need for. So if you're thinking communication devices, then certainly there's a lot of support to help get those funded for populations. If you're thinking just assistive technology then it's probably unlikely that a third party payer is going to actually provide funding for that. So in that case, I think you have to consider what is available to the person, maybe what they already have in their home and also if they do not have, and something available to them, then you're gonna wanna rely on a non-tech support to begin with, and then maybe figure out where to go from there. Okay, if a patient has a smartphone, do you gravitate towards the phone as an external aid with use of the calendars, audible reminders,

alarms, digital to-do-list and such? Absolutely, if the person likes their smartphone and knows how to use it. I can tell you an example of a young man that I worked with who was actually a varsity athlete in college and he had a very severe injury, and so he was relatively tech savvy and he didn't wanna look different than anybody else, right? So we weren't gonna get him something else that he had to like pull out and look, maybe look a typical compared to his peers. So he really wanted something that could be embedded into what he already had, but what we did is we went through a whole bunch of applications that we could find that were free of use with maybe some in app purchases and things like that and we ended up with one that was actually created for a support for moms.

So it had everything in there from like, a calendar to a shopping lists to the ability to take notes and alarms and things, and he loved it because it provided him with all the support that he needed, but it didn't make him look any different than anybody else. So I think that if you can, as I mentioned in the answer to the last question, if you can rely on what they already have and what they're used to using and decrease that new learning impact, absolutely do so, but think about also how a phone could be a distraction for somebody. So if they're likely to take out their phone and start texting, or looking at their email, or going on Twitter and they're not actually going to stay focused to the task and the thing that they need to do, it could serve as a potential barrier. So I think you can think about that too. So I think that's a good place to start if you have the ability to look at what they currently have. Absolutely, good question.

- [Amy] All right, well, that does bring us to the end of our questions for today. Thank you, everyone for submitting those, and for Jessica, thank you for addressing all those questions. Those were great. So we'll go ahead and wrap it up there for today. Again, thank you so much for joining us, Jessica. I learned so much. You have so much knowledge to share and great ideas for our patients. So thank you for that, and thank

you to our participants for joining us today. We certainly do appreciate everyone's time and look forward to seeing you again soon. Have a great day.

- [Jessica] Thank you, everybody.