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Re-engage: Accessible Solutions And Inclusive Considerations For Gamers With Disabilities

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- [Fawn] Today's course is Re-Engage, Accessible Solutions and Inclusive Considerations for Gamers with Disabilities. Our presenter today is Erik Johnson. As an army occupational therapist for more than 10 years, Major Erik Johnson was instrumental in the care for service members who had sustained devastating physical, cognitive, and mental health injuries during combat operations. He was awarded the Bronze Star Medal for his work with brain injuries while deployed to Afghanistan from 2009 to 2011. Leaving the army after 20 years, Erik now serves as an assistant professor at the University of Mary Hardin-Baylor in Belton, Texas. He also serves as the Chief Medical Officer for Warfighter Engaged and the medical director for Operation Supply Drop, two organizations that support military service members across the spectrum of care. As an occupational therapist, Erik specializes in the use of technology as a therapeutic medium for rehabilitation. He has used video games as a treatment tool for over 14 years and looks for opportunities to advance practice by incorporating them into the mix of traditional approaches. Erik also serves as a consultant to the video game industry as it relates to creating hardware and content that is more accessible for all gamers, regardless of physical, mental, or cognitive deficits. Welcome Erik, so glad to have you back.

- All right, I wanted to start us off with this really cool piece of history that will really go down as a big moment for occupational therapy as it relates to what we've been doing over the last few years and kind of the future of what we're going to look at. So could we go ahead and play slide seven for me?

- My name is Grover.

- Sean.

- My name is Ian.

- I'm Taylor.

- My name is Owen, and I am 9 1/2 years old.

- I only have one.

- And, yeah.

- I love video games, my friends, my family, and again, video games.

- Whenever I play, it makes me feel happy.

- The fun that you get to have with connecting with your friends.

- You make your own rules.

- It's his way of interacting with his friends when he can't physically otherwise do it.

- When I'm playing with a regular controller, there's some things that don't work for me.

- It's difficult for me to use both joysticks and the D pad at the exact same time.

- And it just slowed me down a bunch more, while other people were like .

- She's never had the freedom to play at the level she knows that she could.

- I never thought it was unfair. I just thought, hey, this is the way it is, and it's not gonna change.

- What I like about the adaptive controller is that now everyone can play.

- I don't even have to look at the controller and just be looking at the screen like, hey, yup, yup.

- You never want your kid to feel like an outsider or an other.

- One of the biggest fears early on is how will Owen be viewed by the other kids. He's not different when he plays.

- You can do it, Owen, come on!

- It's a little challenging, but that's the whole idea of gaming.

- I can hit the buttons just as fast as they can. Nothing can crush me.

- All right, so, you know, I have to, I have to show that video, because I think it gives us a better perspective on kind of what we're going into and why it's important. So let's talk about the learning outcomes. We're gonna discuss the specific influences and strategies that occupational therapists have used to influence the technology and video game industry. We're gonna describe problem solving techniques for evaluation and recommendation, or recommending adaptive gaming configurations for gamers with disabilities. And we're gonna describe specific accessibility options for gamers with disabilities to include the buttons, switches, joysticks, and different other peripheral devices. So first, a bit of history, because I always have to go back here, because OT at its core, we originated in mental health. And this is no different. We're

empowering somebody to believe in themselves and believe that they can do. As you know, OT started back as reconstruction aids during World War I. Back then we would pull people off the front lines, engage them in activity, and normalized life for them to be able to get back out. And again, you know, if you fast forward several years, it looks the same. And this is me with some troops, kind of normalizing life and kind of getting some of those, the burdens of being at war kind of melt off you and be able to understand that this isn't my norm. And so as we kind of look at this session, I just want you to remember that this is all kind of boils down to mental health, enabling somebody to be able to do and engage in life as they want.

So for OT itself, you know, we enhance function and independence in all areas of life. And that includes leisure activities. And so many people kind of forget that piece of it. And if you know anything about me and my history, I have a huge passion for being able to reengage in those things that maybe weren't there or maybe that we lost after injury or whatever deficit that you might have. And you know, gaming kind of brings out this kind of different spirit in us that can take us through those toughest times in life and lets us kind of melt into a world that we don't necessarily have to take so serious. And I think that it's a huge piece of the pie when it comes to, again, that kind of mental health aspect that says that hey, we're back to where we were or we are, where we need to be. You know, when I was deployed to Afghanistan, or when I came back from Afghanistan, I started working with these guys with amputations and whatnot. Some of the things that we talked about often was what we want to be able to do to reengage in life. And a lot of them, you know, a lot of times they would say, hey, I want to be able to play video games, but I lost my hands. So obviously that's out of the picture. I don't ever want that to be out of the picture. And so this is kind of what started this track for me, trying to get them to believe in themselves, to believe in the process that we can still get them gaming. And so this whole presentation's gonna look at what that process looks like and how we can attack some of that, some of the stigma that goes into video games, but also being able to play or not being able to play. So for me, just

in general, I have two big approaches to gaming when it comes to the gaming and technology. The first approach is that I want to discover ways to use gaming and technology therapeutically. That's a big thing for me. The second thing is that I want to discover ways to make gaming accessible for everyone. For the first thing, we're not gonna talk about that today. That's a whole different lecture altogether. But today, we're going to talk about the accessibility part of OT and how we've kind of penetrated the industry.

So let's start out with controls. The biggest things for controls that I wanted to introduce you to is that this all started for me because as I first started by adventure in gaming itself, I looked at ways that I could get people to game with the things that were available in the commercial market. And you can see this is my gaming center here. And you'll notice that there's lots of different consoles, lots of different peripheral devices. And the picture to your right is a bunch of controllers that go to that. If you think about controllers in general, they all work different ways. The typical controllers today are handheld and both hands operate them. And they have, you know, anywhere from 15 to 22 inputs that control something. But if you rewind a bit, you can see, you know, back in the day, Nintendo kind of had this idea where maybe they could do, and I don't know if they thought, like, hey, this is great for accessibility. But if you look at it, the traditional Nintendo controller, which I'm gonna show you that right now... Sorry about that. Here's the traditional controller that we had. And you guys probably remember this guy. This was a old school Nintendo game pad. The problem with this game pad itself is, again, you would need two hands to be able to work it. And so Nintendo actually came out with another controller that was kind of this beast here, which is the NES Advantage. And the NES Advantage essentially gave you the ability to put the controller down on a surface and be able to have bigger buttons. And so there was a little bit more ways to make this accessible. This controller is also really neat because you can have turbo options, which basically means if I click this button, I can then just hold down other buttons to operate the control itself. It also has a slo-mo

button, which is really awesome, because if you have a player with cognitive deficits or somebody that can't play as fast as they need to to succeed in the game, you can slow things down like that. And then Nintendo also had this controller, which I love for one-handed gaming. And this is your typical analog stick. It's almost like a flight stick. And you think about it, what's neat is back, this is back in the '80s it was built, and it's got these suction cups right here that you could pop right down on a table, and it would stay, almost like Dycem or something. And so the thing would stay, and all my buttons, the controls that I had on your traditional controller are now like up here on top. And so you have, if you had one hand, you could still play the game, going left to right, up and down, and the buttons on the stick itself. So kind of really neat that Nintendo early on had put this out there, but not necessarily intended it for that type of use. So it's worthwhile to say, as we continue to grow in the video game industry, in the kind of more accessibility and inclusive design, those things were kind of taken in consideration, you know, as we were continuing to make this a more, kind of robust place for us to explore.

All right, so when you're approaching gamers in general, and this is one kind of area that as an OT, this is why we're perfect, is that everybody has their own unique set of controlled movements. Excuse me, sorry about that. And in those movements, I always try to find ways that I can use them. It does me no good to look at a patient and say, all right, well, what's his disability. What's holding him back? That does me no good. I can't do anything with that information. But what I can do is I can say, tell me what you have, and we're gonna work with that, and we're going to optimize your ability to play in general. And that's where I want to always kind of take my conversations when I'm evaluating somebody. 'Cause again, it does me no good if I'm sitting there saying well, you don't have this, you don't have that, you don't have that. That doesn't matter. What matters is what you do have and how I can use it to benefit you moving forward. So there's a lot of interesting misconceptions in the video game industry. Recently, PopCap revealed that one in five players of casual video games have an impairment

related to physical, mental, or developmental disability. So that's like 20% of casual video game members. And I think people think, oh, you know, gamers with disabilities represent such a small population of people that it really isn't a huge deal. And hey, we shouldn't have to worry about that population. But when PopCap did this survey, it really opened the doors for like, hey, actually like one in five actually potentially has some kind of disability, whether that be cognitive or motor or vision or something like that. That's a big number when we're talking about trying to figure out accessibility options and if we're going to cater to a specific audience. Another misconception that people say, and you know, I'd get this all the time with my patients, is that I can't game because I don't have hands. And I hear that all the time. Well, unfortunately, I can't game because I lost my hands, or I don't have hands. And that's just something that you have to have. Excuse me, I apologize. And that's not it at all. At the end of the day, like people have figured out different ways to do it. And really, you just need to explore that community. So I want to introduce you to AJ. And I'm going to have them queue up a video for me here in a second. But AJ has a condition called arthrogryposis, which most of you probably know what it is. But he's going to explain it in this video. And I want you to kind of just look at some of the things he's able to do without the use of his hands. So let's go ahead and queue up that video. All right, hey guys, this is AJ. We're gonna be throwing down some Killer Instinct. But before this, AJ, just tell us a little bit about yourself, kind of your diagnosis, things like that.

- Sure, so my name's AJ, or ONLYUSEmeFEET online. I have a disability called arthrogryposis, which basically means some of my nerves and muscles don't work like they should. However, I can play video games with my feet. So that's how I play games like Killer Instinct. That's how I code video games and do a lot of other cool stuff.

- Cool man. When did you start gaming, like early on?

- Yeah, when I was three years old, I used to play Street Fighter II with my brothers.

- Right on, right on. How fast does it take you to kind of get things down and kind of figure out this is probably a good medium for you?

- Almost immediately. I mean, my first time looking at the Street Fighter, like it was just so cool to unlock that secret. To me, it was a secret how to do that. So ever since then, yeah.

- All right, well, we're gonna throw down on some Killer Instinct. I will tell you, I'm not very good at this game, so. It's already starting out terrible.

- [Video Game] Yeah, his jab is a combo, odd combo.

- Are you kidding me? Oh, I did something to you. How about that?

- I blocked it, though.

- I don't know if it's gonna save you, though. You know why? There is something off on your...

- [Video Game] These cameos are killing me.

- Okay, so that's awesome. Like, I love to show that video of AJ, because he has taken a situation where it would be easy to kind of cop out of a lot of different things. And he said, you know what, I'm not gonna let this stop me. I want to play video games just as much as my friends do, as my siblings do. And I'm gonna jump in there and do whatever I can to make it happen. Now you'll notice in that video, he was using a larger controller. But I have another video of AJ using a traditional controller that's this big. And he does an incredible job with just having that small controller. AJ is online, and

he's an incredible person to watch do things. His handles are ONLYUSEmeFEET, as was on the video. So if you have a minute to kind of see some of the things he does, it's incredible. All right, so let's talk about actual accessibility in gaming. Like, where does this lead us? When you look at accessibility, and we're gonna spend most of our time talking about the motor, the physical, motor barriers that people have when it comes to video games. But we're also gonna discuss some of the other places, like cognition, vision later on. But when you look at the focus areas when you're approaching some kind of accessibility thing, we look at motor, cognition, vision, hearing, speech. And then there's this kind of other place.

So let's go straight into motor. When you're looking at motor, as we're talking to developers, and I'll talk a little bit about this later working with industry, but you want to encourage them to build a game that has controls that can be remapped and reconfigured. You want to be able to adjust the sensitivity of the controls. You want to make sure that the controls are as simple as possible, or give a simpler alternative. And then you want to ensure interactive elements that they're large and well spaced. So like if you were using a phone or a tablet or something, you want to make sure that that phone and tablet has enough space to be able to work around. And so we're gonna get into motor deeper, because I think this is where a lot of you guys will start to kind of see the applicability of this course. So let's talk about occupational therapy itself, the journey to the Xbox Adaptive Controller. If you're not familiar with it yet, you're gonna be very familiar after this. And just accessibility in gaming itself. So you see a picture there on the left, that's myself, Erin Muston-Firsch, and Kaitlyn Jones. And the three of us have worked tightly with the Microsoft team, helping develop a great, robust community of inclusive-minded people. And that includes with accessibility with other tech, not just video games, and just everything in general. We worked outside of that as well with Sony and some of these other places that are looking at accessibility as options. Erin and I mostly worked on the controller as occupational therapists. Kaitlyn came in as a student and was instrumental in working with some patients before the

release of the device itself. It was a pretty incredible journey to get there. And before we get there, I did want to talk about like how did we get to the point where somebody thought the controller was needed. Like what brought us to the point where somebody said, you know what, we need to make something like this. And so let's rewind for me.

So I came back from Afghanistan in 2011. And while I was there, or when I got back, a lot of guys, again, would come back. They would have different injuries. And they would say, like, yeah, I really want to be able to play video games again. But my hand doesn't work, my entrances don't work, I can't hold a controller. And so I would do everything I could to my OT mind to be able to engage them with some kind of way to play. And so that would be selecting different controllers, but sometimes splinting, finding different splinting options to position their hands or, you know, hold a controller itself, or something like that. But really, my splinting knowledge in using controllers could only take me so far. So I had this chance meeting with a man named Ken Jones, who's the founder of Warfighter Engaged, which is a nonprofit that builds video game apparatuses and stuff for wounded service members. So you'll see a lot of his work and the Warfighter Engaged team's work throughout this presentation. But early on, Ken came up and he said, well, what's going on here? I was like, well, he can't game because he doesn't have this or doesn't have that. He said, "Well, why don't you just rewire that control. "And you could put this over there, that over here, "and this can look like this, "and this can move like that." And I was like, I don't know how to do all that. And so, he's an electrical engineer, so he knows how to rewire things. And so what he would do is he would take controllers like this, and you know, he would take all the buttons on the left side of your controller and put it over here on the right side of the controller. So traditionally, you would use kind of four big fingers to work a controller. So your thumbs would do the sticks and maybe your buttons over here. And then your triggers would do the trigger buttons and the bumper buttons. So that would be your four main fingers. But you have six other fingers that you could do stuff with. So when you're working with the controller, being able to say, hey, well let's take all

these buttons over here and move them to the other side of your controller. Now all of a sudden I can use everything on the left side and remap things so that it works better. And so he would do things like that where he would remap controllers. He would rebuild motherboards so they would have switches that came out of them, larger buttons, larger options for controls and whatnot themselves. And so, you know, from that, we kind of started getting bigger and better at making these big rigs and platforms, as you can see here. And some of them, you know, they're just kind of laptop-type things, and some of them had to be completely built from the ground up, like using different type of stands, you know, mounting things to places, setting different places up, and really end up making a whole gaming setup for somebody who had lost their limbs.

So you can see one of our gamers over here, he had bilateral amputations of his arms. And so he needed a larger set up so that he could get in and play different ways. And so there's all kinds of different ways to engage with that. Like you can make different custom switches. And we'll talk about some of the switches that are out there. But just suffice to say that in a situation where we have so much going on, we want to making gaming as easy as possible for anybody that we had been working with. And you can see on our next one here, there's other kind of controls, too, that would use, like if you had somebody who had a paralysis or something, this particular gadget here is a QuadStick. And so this QuadStick has sip and puff controls. You can use this for directional type things. And so a lot of options here for being able to engage, again, with a chair, with a video game device, whatever it is. So that's pretty significant, especially when you're working with somebody with like a high quadriplegia or something like that. And you can see some more setups as far as the different kind of unique places that people have. And so here's a sip and puff control. And this is a joystick and different types and size of buttons. And so we're always looking for different options. And whether it's PlayStation or Xbox or whatever, one way or another, we're gonna get you there. So that kind of led us to this conversation with

Xbox. They had seen some of the work that we had been doing with veterans and wounded service members. And they reached out to us and asked us to come over, come out to Redmond in Seattle, by Seattle, to have a discussion about accessibility in gaming. And while we were there, we talked about a lot of things. We talked about cognition. We talked about how to get people over their deficits so that they could engage in gaming. Microsoft started a big campaign that was called Gaming for Everyone. Basically it's they were on a mission to make gaming fun for everybody, anybody. There would be no exclusions. Even if they were gonna have to bite the bullet and maybe not make money on something, that it was the right thing to do. And they wanted to approach the community with that. And so we had this conversation. There was a hackathon that they had where they were trying to figure out all of these different ideas to be able to get people gaming. And so from that discussion and from those initial conversations, this idea of a controller that essentially had ports that you could plug into it kind of came from. It was a very unique conversation that seems like a small niche. But now we know it's a bigger niche than we thought. And if we could make the hub, then people like Warfighter Engaged or Ken Jones wouldn't have to rewire a controller or refigure a controller. And they could just plug and play, like you have almost a brain or a hub, and you could plug the switches and things in. And we'll talking about those specifically. And that's where it was kind of born. So I'm going to, and I'm going to actually pause what I'm saying because I want you to kind of see some of this. This is, again, Erin Muston-Firsch. She's an occupational therapist at Craig Hospital over in Colorado. And she was really instrumental in getting this developed. And I want to show this video of the system working and her being interactive with it. So let's go ahead and roll that.

- At Xbox, we have a controller design that our fans love. However, for gamers with limited mobility, or gamers who don't use both their hands, this controller design might not work best for them.

- I pushed you out of the way, I'm sorry. Doorknobs are the worst thing ever invented. Putting on shoes, the cell phones that I use. These are the sorts of things that we don't think about until we have to. And I think about them every day.

- Yeah! I have cerebral palsy on my entire right side. This side of the controller is fine. This side doesn't happen. As game platforms have gotten more sophisticated, the controller have gotten more sophisticated. And it started to get really frustrating. Oh no!

- We designed the Xbox Adaptive Controller through feedback from the accessibility community.

- [Woman] The Xbox Adaptive Controller is really easy. You just plug it in. And then you can plug in various other devices. I can make it work for me the way it has to.

- The Xbox Adaptive Controller, a gamer can game with one hand and one foot, or one hand and their shoulder, or even one foot and their chin.

- And I can change it from game to game.

- Ready, forward. Squeeze, Tom. There it is. Craig Hospital is a facility for patients who have had their head or spinal cord injury or a traumatic brain injury. And it's a place for their rehab.

- We're every game night and we're helping new patients getting back into gaming again. Is that the D pad?

- Yeah.

- Okay.

- Our role as occupational therapists is to get people back to doing. When the Xbox Adaptive Controller came along and acted like an Xbox controller, and it just worked.

- Uh oh, over there.

- Ooh. On the standard Xbox controller, it's just hard to press the buttons, because can't really put pressure through my hands. But then with the Adaptive Controller, I can use larger joysticks, larger buttons that are easier to press and reach.

- Corey and his brother Zachary are twins. Before Corey's injury, Zachary had gamed with him regularly. And that was a way that they related to each other as siblings.

- [Man] Who do you love playing Xbox with here at Craig Hospital?

- [Corey] Zak.

- [Erin] The Xbox Adaptive Controller and the copilot feature allowed them again to play games together. So there's a huge social component to it.

- You got that, yes, yes. They can play any game they want. I see the confidence just burst out of them.

- So I love showing that because again, it's great that, and what it didn't say in there was some of the things that Erin contributed to the process when she was approached by Microsoft. And if you look at these kind of early sketches of the Xbox Adaptive Controller, this is kind of the idea that they were looking at. Some of the different types of configurations and whatnot that they were looking at. And this page right here will

show you some of the early renderings of it. And you'll notice, especially in this one here, let's see, let me get your... Especially this one here, you'll see this is a full rectangle box space. And so one of the recommendations Erin had had, and I had mentioned this as well to them, is that we can't work on these like big, hard ridges. And so she had recommended that we kind of go on a slant and an angle. And you can see eventually it comes down to having a more angle. And then they rounded the edges. We're looking at, again, ergonomics here. This is all the stuff that we learned in OT school. This is all the stuff that we should be practicing and seeing when we're looking at accessibility and inclusive design. We certainly don't want to introduce injury to a place that we're trying to help with accessibility. And so all that to say OT was really instrumental in coming up with different suggestions and ideas of kind of how to get to that place that would be rich and full and give a person the best game experience that they could. So let's actually look at the controller itself a little bit deeper. Let's run the Xbox, you know, the next video.

- I want to break that down a little bit more. I actually brought one with me here. I thought you guys might want to see it. The neat thing about Microsoft making this product is they didn't just think about the controller, they thought about the person receiving it. And so the packaging comes in a way that is really easy and accessible for somebody to grab. So they can grab a small tab, kind of pull it up. And this controller just comes straight out. This tab comes down. And if they just have like gross motor grasp, they can pull it straight out. And it's not something that's very tough. It's got everything in it that you would need. And the packaging is just seamless and smooth. Matter of fact, not only that, if you have it mailed to you, the outer packaging is also accessible and it has thumb holes and whatnot, so you don't have to get frustrated with tape or whatnot. So let's look at this. So that's the controller itself you've seen on there. The big magic is these 19 ports here on the back. Those are all 3.5-millimeter ports that are gonna give you different ways to hook up buttons and switches and whatnot. So that's gonna be kind of the magic of that. So let's look at some of the

peripherals and everything that go into it. You can see kind of, that's what I just said. It does have a D pad. The one thing to note is like everybody's drawn to these two big ol' buttons here. And you could use these. This is incredibly durable. People have been known to throw these across the room during presentations, but I won't do that. You won't see it banging anybody. But these two big buttons are very durable. You could put it on the ground, use it as feet pedals if you wanted to. You could use it for different things. And the controller is completely customizable. And so this right now is an A and B button. But if I wanted it to be a trigger, I could use it as a trigger. If I wanted to go left and right with it, I could make it left and right controls for it. You would use the Xbox app, which is in the system settings and whatnot, and you would change it that way. But again, it goes a little bit deeper, which we won't go into today. But it's another really cool feature.

So again, let's look at some of these things that we have. And I'll just kind of mention and kind of point out a couple things while we're here. So there's the controller itself. So everything is plugged in here at the top, not in this picture, but that's where it will be plugged. You can see like these are some switches that Warfighter Engaged, they made these for different types of needs. So some people will work better with this kind of like kind of like rainbow type pattern. Some people need it kind of closer together that mimics more of a controller, so your A, B, X, Y. Some people just needed a couple buttons. Some people just needed a single button. This guy is actually a switch that will, that you can kind of activate by just kind of pushing. This is a controller, an analog stick. And this is a smaller, lower profile. So if you just kind of had a little hinge and you could be able to then pop on there and do it. Over here on this other page, some of these, this is that lever switch that I showed, that one that's right there. So you can see just how kind of popping it would serve you in that capacity. This little disc here is a sensor. So it actually is very, it's almost like a track pad, so you can move just by the simplest of gestures. Again, you see some of these other buttons and switches here. This is a tiny analog stick. But sometimes having that away from the controller is all

that you would need in regards to that. Here's some setups that we had. One thing to note that I think that a lot of people miss is that you're gonna need brackets and mounts. And so you can see, these are standard mounts that you can get pretty much anywhere. And you can hook them to a wheelchair, hook them to wherever you want. But a lot of times, if you want the right positioning, you're gonna have to put it in place. And so for this particular setup, it's kinda hard to see, but there's actually two leg switches here. So one on the right side, one of the left side. So if this gamer wanted to like, let's say switch weapons or switch characters and he needed a quick access to that, he could just move his leg right or left. And so that's two switches that he gets out of the way. And so some of those other setups, you can see he's got some buttons up here. He's got an analog stick right there. These other patients, they don't have as much upper extremity as this one. And so they have foot controls. And foot controls are kind of a huge deal when it comes to losing your hands, 'cause that's two switches that you can activate that are on the ground. Actually, let's take a look at the foot controls a little deeper. Let's roll that foot control video for me, guys. And we'll kind of show how. It's on.

- We got aim in, shoot. I'm only 11 at this level, so it's all...

- Like can you grab a thing of Dycem, throw it under there? You see how it's slipping on him? And you hear me say we could probably use some Dycem. And that's just, you know, to note, you know, you just have to figure out what's gonna work, what's not gonna work. And so that's a big part of it. And so foot controls are big time. Another thing that you can use, this is called the 3D Rudder. It's commercially available, and this company basically made it. It's got accelerometers in it, so it knows which ways that you move. So you can control a person's movements, and you can completely customize this however it worked best for you. But that's a pretty cool accessibility device as well.

And then now I want to talk about some of the different advancements in gaming, places that we're gonna go with stuff. This particular set of headphones, you can see them right here. This is called the Audeze Mobius headphones. And these are like 3D headphones. And I'm gonna share my screen so I can show you what's happening with it. So give me two seconds, and I'll get you popped up here. All right, so you see my screen over here. So what you see right now is my headphones, as I'm moving them, you can see that the head is also moving at the same time. Now what Audeze basically did was made an interactive headphone with accelerometers in it. So I can actually put this head and align it straight. So I'm gonna push a button, and it's gonna center it. And so now, if you could see, like if I was wearing these headphones, they would kind of detect my movements. And so you can kind of see what's happening right there, right? So the significance here is that each of these movements that I do are movements that I can assign to a button or a switch or something like that. And so I can assign those. And so if you think about this particular situation, I have one switch here, one switch here, forward and back, left and right. That's six different switches. And so it's a pretty significant advancement that will open some doors for people that, you know, maybe again, are quadriplegics, or something like that. Another thing is Eye Gaze. Let's pop in the Eye Gaze. And we're only gonna play about half of this, Kaitlyn, so you can just kind of go. So the point here is that if you look at the flies, is that right?

- Yeah, you kind of play it without even trying. So the point of it can be whatever you want. The more bugs that you eat, the bigger, fatter frogs you see.

- Now to note, like I know it's kind of hard to hear, but essentially, I'm just looking at the screen. She didn't teach me how to play. I'm just playing because it's detecting my eye movement. And so I think this could be a future of some of the games. Kaitlyn, you can go ahead and turn that video off. And so this could be like a future of game accessibility that would be an awesome feature for, you know, different type of stuff. And then, you know, kind of moving on in the future, like maybe being able to use it for,

you know, engaging with a screen or something, or interacting with specific menus or whatnot. So this is a big thing. You know, to note, with Eye Gaze technology right now, it only works with a 28-inch screen. And so I think the limitations are like, hey, I want to, you know, make it on this huge 85-inch TV. It's not gonna work. And so that's somewhere we need to figure out and get good at.

All right, so let's move on. Copilot is another feature that's really significant. Copilot essentially gives you the opportunity to take one player on a screen and have two gamers control it. And so like if you're a Master Chief in Halo, and let's say you're working a child that really cognitively had some deficits, and you know, you'd have to like, and all they could really do is push maybe one button, or do two or three commands, but the game required a more robust interaction, I can split that character into two different remotes, or two different controllers, and be able to have them play the same guy at the same time. So for example, if I was like, all I want you to do is jump and shoot, I'm gonna move him around. I'm gonna face him in the right direction. I'll change your weapons for you. I will do all the other things. All I want you to do is focus on jumping and shooting. So maybe you have a person with a traumatic brain injury, or with, you know, or they have some gross motor movements, or something like that, that would be something this would be awesome for. I use Copilot all the time. And it's on every single Xbox already, every single control. And so it's just a matter of turning it on. And it's a very simple switch. So if you want to learn more about that, email me, or you can just Google it and it will show you what you need to do. So Copilot's awesome.

So OT in industry. So this is a big, big area that we're trying to penetrate. In the next few slides, this is what we're talking to developers about, and trying to get in the mix. It's significant that OTs are talking to people in industry because of, you know, considering different types of accessibility things. Earlier, I told you motor was a big component we talked about, which it is. And so we're just gonna real quick go over

some of the other things we would mention to developers as they're developing games. Because at the the end of the day, if they can develop the games in this rich format, then later on, I can, you know, make it work for somebody. So we're gonna talk about cognition, vision, hearing, speech, and a little bit of everything else. So in cognition, we're gonna look at stuff that's like easily readable default sizes for fonts. We want to have simple and clear languages. We want to have a big, robust menu of ease of the game, multiple levels. So like for example, if I was kind of running not as quickly as I once was because of a brain injury, I would want an easy level where I could still succeed and enjoy the game, but I can also grade the activity to make it harder if it was something where I was trying to push my patient to be even that much more. You want to make sure that players can progress through text prompts at their own pace.

And you want to kind of avoid those flickering images or repetitive patterns. That might stimulate some kind of reaction that you don't want. In vision, some of the same things apply here, still, like you want to have easily and readable font size, like we said before. And you want to make sure that you keep in consideration color blindness and whatnot as well. So no essential information is conveyed by just a single color alone. You want a good high contrast between text and the user interface if you have subtitles and whatnot. And then you gotta be careful when it comes to the virtual reality and simulation sickness, which is kind of a whole different world of things that you have to consider. Hearing and speech, again, you want to have separate volume controls for mutes, or mutes for effects, speech, background music. You don't want any essential information that's only by sounds. You want to make sure it either says, like, loud crash on the side, or you have the information that you can read or it's shown. Think of the old Batman series with the flash and the bang. That would be a cool idea as you're developing a game. Ensure that speech input is not required, and it's only included as a supplementary or alternative input method. So there's different options there as well. And again, you wanna make sure that you have subtitles in the mix, and you wanna

make sure that they're big and robust and have good contrast between it and the user interface of the game. Speech, we're gonna provide subtitles, like I just said. Different separate volume controls, like, you know, the vision as well. You don't want, again, just a single sounds alone information that is put forth for the gamer. And again, if the subtitles or captions are used, make sure that they're easy to read. So other things, like, you wanna have again, some, you know, a lot of different difficulty levels, which we talked about.

Details of accessibility features on packaging should be there. So like if you pull out a game, you can see like these are the things that we worked on accessibility. So if I'm a blind gamer or, you know, had motor impairment, I could easily still, or I could see what the accessibility features are so that I know if the game is appropriate for me. And then a lot of developers we're encouraging to have a very solid accessibility feedback feature so that we can kind of get the information later on. So other possibilities, you know, Microsoft, I've talked about already, they've developed an inclusive tech lab, which is a place where you can bring gamers in to kind of learn how to game independently. It's a place where they explore accessibility, inclusive design. They've done a lot of work here just to make sure things at Microsoft kind of stay focused in a world that wants to make gaming accessible for everyone. You know, some other options for accessibility is like taking away the controller in general. Like the Xbox Kinect, which they don't do a lot of games for these anymore, but the Kinect is still out there. And I use them for a lot of things like, for example, Fruit Ninja for Kinect. If you guys aren't familiar, it's a, typically a swipe game that's on a phone that you slice the fruit in half or whatnot with your sword. For the Kinect version, you actually interact with it with your whole body. And so you're moving your arms and swiping with your arms. And it's a very, it's a great game to work on cardiovascular exercise, get people moving. And also you don't need your hands to be able to play. Also, if you're in a wheelchair, this is great for, again, exploring cardiovascular stuff, 'cause it can get them moving a lot. And it'll be able to detect arm movements and whatnot. So that's

another option. I mean, sometimes just finding those ways in already designed developed games are everything that you need.

So one thing that I want to talk about with Nintendo, so like most of you are probably familiar with the Nintendo Wii. I mean, we've all had them in our treatment clinics. We've all used them for Wii Bowling or whatever. But a lot of people don't realize that the Wii is 13 years old. And actually, not only is it not necessarily relevant, there's been two other Nintendo systems that have come out since. And the Wii U came out. And then more recently the Nintendo Switch in 2017. And the Switch is an amazing piece of equipment that, kind of like the Wii, uses everyday movements and activity that you can mimic, again, day-to-day life. So there's a shaving one on there. You can do fencing. And one thing that the Switch did was it pulled away from the TV. And so you do a lot of interacting with each other. So instead of like watching a screen, you're watching each other. And so if you're fencing, you're fencing each other. And again, there's a lot of accessibility features where you can, you know, pop those, the Joy-Con is what they call them. They used to be the Wiimotes on the Wii. Joy-Cons, and so you can kind of make them move, like accelerometers and whatnot. But the Wii is still like real purposeful in a clinic setting, and for accessibility. If you're looking to be able to play it, like a game without using your hands, Wii is a perfect example. The reason why it's so relevant is 'cause of this bad boy right here the Wii Balance Board. And if you guys aren't familiar with that, the Wii Balance Board kind of uses subtle weight shift patterns so that you can move your character front and back. You can do yoga on it, work on your balance. You can work on vertigo. You can work on a bunch of different things. So when you're approaching something like this, you know, the Wii does have its place. And I'll still have a Wii in my clinic until they replace something like this where it gives me that proprioceptive feedback of weight shift and push and everything. And I think that's significant to say, again, when you're interacting with a game again and whatnot.

You know, the future in gaming is going to be interesting. You know, at the end of the day, we're only getting better with technology and whatnot. And you know, this picture's really cool, because what we did in this particular picture is we were trying to hook a Wiimote to the myoelectric sensors in a myoelectric prosthetic. And if we could get this to work, essentially what it would do is it would allow for contraction in the muscles to be able to operate different switches on a controller. So think about, you know, if I have any control of muscles in my body, I could contract that muscle and essentially hit a switch. And so, as we look forward to the future, you know, switches are gonna be something where it's like a myoelectric read or some kind of EMG thought pattern type thing. There's gonna be all kinds of different ways that we could interact with kind of the world of the gaming platform that we're in.

So one other thing that I wanted to encourage you guys is like as you're kind of looking, you know, at how this is going to be relevant to you and how you can kind of move forward, you know, in general, technology's not going anywhere. It's only gonna move forward. And we have to kind of really understand that it's gonna be something that we either harness and use in a really good way, or oppose it till the day we die. And it ends up not being like as significant, or you're not as relevant, generationally kind of relevant, as maybe you could be. And we want to get to that place. As OTs, we're looking at what makes people tick. And if, you know, in 30 years, I'm in a skilled nursing facility and somebody does an inventory and says, "Hey Erik, what kind of things do you like to do for fun?" I'm gonna be like, "I wanna play video games." I'm just gonna be honest. That's not true of our current generation of geriatric patients, because they grew up on, you know, the television, maybe, and some newspapers. And so when you do their interviews, that's what you get. But in the future, our future's gonna be very different. Not gonna be necessarily unlike something, you know, out of a movie, or whatnot. Anyway, so thank you so much. I'm gonna open it up for some questions. I know Brian already asked which headset did I have on here. And the headset again, it's called the Audeze Mobius. And here's the actually, the Mobius is

M-O-B-I-U-S and Audeze is the company that makes it. And so you can Google it and get it online if you're interested in that. Is there any other questions before we wrap up?

- Hey Erik, I see a question coming in. It says, "Could a COTA get into this field? "I have experience with hardware and switch design."

- Yeah, so the question was could a COTA get into this field. You know, honestly, I think anybody could get into this field. I think we were lucky. I mean, I didn't go into this whole world thinking, oh, I'm gonna start working with Xbox and the video game industry. It never had anything to do with that. It had everything to do with doing what's right for humans. And then it kind of translated into this really cool opportunity where people cared. As a COTA, to get into this industry, it's not gonna matter if you're a COTA or an OTR. Industry is industry. And they care about your ability to perform in a different world. So it's not like you're gonna be doing evaluations like you would typically do, an OTR would do. And so yeah, absolutely. In order to get into the, you know, I'll tell you what. Why don't you email me offline. We can have a conversation about some of the things that maybe you could do to kind of start. One of the things that we had talked about in the future is, you know, combining like an engineering mindset and OT mindset, or even making a school that would go together to kind of interact this really well together, to make this almost super OT that has an engineering background and that works with switches and buttons and everything, and then the OT background who knows how to, you know, evaluate function and enhance function. So it's a great question. There's another question here that said, "How is gaming reimbursed?" So that's a great question. You know, my answer always is you have to be very purposeful with your documentation. It's like being able to be reimbursed for standing and making a puzzle. Don't say that, "We played video games. "Give me money." Like, that's not what's gonna happen. What you're gonna say is, "Patient engaged in purposeful activity "designed to enhance his ability to engage in daily, "or leisure activities or daily function." Or "Patient used gaming activity to increase

balance, "or standing tolerance or endurance." Like you would say those things. And you're focusing on the task that you're accomplishing because you're not accomplishing gaming. You're accomplishing one's ability to be functional in their space, one's ability to be independent and purposeful in their world. So I hope that answers that a bit. But you do have to get a little creative with your documentation.

- Erik, I don't--

- Any other questions?

- [Fawn] This is Fawn again. I don't see any questions coming in. But he's provided his email address and some of his social media platforms. So please feel free to reach out to him. I don't see anything, Erik, so I think we'll say we'll wrap up for now. So thanks so much for being with us.

- Great. Thank you so much, guys. And thanks for being on, y'all. I appreciate everything. Please feel free to ask questions and email me and I'd love to answer

- Great, I hope everyone has

- anything and work with you.

- a great rest of the day and you join us again on Continued and occupationaltherapy.com. And Erik has a lot of other great courses on our site, so please check them out. Thanks, everyone.