

Meet an Occupational Therapist and Physical Therapist

A Conversation

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[00:00:00] **GG deFiebre, PhD:** We are pleased to be joined by Kaitlin Hagen and Dennis Tom-Wigfield. Kaitlin is an occupational therapist the manager of Therapy Services and Dennis is a physical therapist, too, at the Kennedy Krieger Institute. Thank you, both, for joining us today.

[00:00:20] **Dr. Dennis Tom-Wigfield:** Thanks for having us.

[00:00:22] **GG deFiebre, PhD:** So, do you mind just sharing your slides now, Dennis?

[00:00:27] **Dr. Dennis Tom-Wigfield:** Sure.

[00:00:27] **GG deFiebre, PhD:** And I will hop off.

[00:00:33] **Dr. Dennis Tom-Wigfield:** Is that how it's supposed to look?

[00:00:36] **GG deFiebre, PhD:** Yes, perfect. Thank you. All right, I'm here but you just won't see me, so thank you.

[00:00:41] **Dr. Dennis Tom-Wigfield:** All right, it's going good. Okay, so welcome, everyone. We're just going to give a very brief overview of the therapy we do at Kennedy Krieger, and then we're going to have questions after that. So, at Kennedy, we practice activity-based restorative therapy with an emphasis on activity. So, why activity? Regular physical activity throughout life is important for maintaining a healthy body. Nevertheless, 60 percent of the global population fails to achieve the minimum physical activity recommendations. And so, we know that people with chronic physical conditions are at greater risk due to inactivity than able-bodied persons because they are often restricted in performing normal everyday activities such walking, housekeeping, gardening, et cetera. And furthermore, if we expect to get neural recovery, how can we expect that without doing activity, right?

[00:01:32] So activity based restorative therapy, or ABRT, is made up of five key components and we'll go through each one of these specifically: functional electrical stimulation, locomotor training, weight bearing or loading, patterned activity and task-specific practice. And then we threw in some extra things that we also do here that can be a part of ABRT as well as sort of their own thing as well. But aquatic therapy, whole body

vibration, home based or community reintegration or integration, TSCS, which is transcutaneous spinal cord stimulation. We don't have a slide for that one but if you want, we can talk about it a little bit more at the end and same with BFR, which is blood flow restriction therapy. Both of those are relatively new in terms of interventions that we're doing, so please ask us questions about those if you have them.

[00:02:28] So, the benefits of FES, or functional electrical stimulation. Here you can see in this picture there's a child with some electrodes on their arm. And so, with electrical stimulation, what we do is we put two electrodes on the surface of the body, just your skin, and we use those electrodes to send an electrical impulse that stimulates the peripheral nerve. So, the goal for FES is to increase your bone mineral density through muscle activation. It's a goal for regenerating the nervous system. Assists in decreasing muscle atrophy.

[00:02:58] It can be used in combination with other components of ABRT, such as standing, exercising, mass-repetition practice, et cetera. It's going to improve your blood flow, muscle health and joint health. And again, it's going to help improve or maintain muscle mass during or following periods of inactivity. Also, just a side note, all the pictures used in this presentation are of kids, but this applies to all ages. We just took these slides from a pediatric presentation.

[00:03:31] So the next one is weight bearing and loading. So, we perform loading across a joint while promoting proper joint alignment and muscle co-contraction surrounding the joint, or, sorry, the weight bearing through the joint with proper joint alignment is going to help promote muscle co-contraction around the joint. And you can see in these two photos here, there's two kids doing different versions of weight bearing. For the upper extremity we can do it in a seated, propped position, in quadruped, which is the fellow on the right, or in prone positioning in your stomach.

[00:04:05] Lower extremity weight bearing can be achieved through quadruped or tall kneeling, standing and in standing you can do this with or without assistance from the therapist or a body weight support device. You can also do it with or without bracing. Although, you know, the less amount of bracing requires preferred. However, if you need bracing to keep a joint safer or whatever, then it's definitely allowed. And we can also use supported standing frames to get people up and standing. And some of these frames are dynamic. Some of them are static. For example, one, you know, very common standers have a gliding component. That actually lets you get lower and upper exercise while you're using it.

[00:04:42] The next component is locomotor training. So, this is an activity-based rehab strategy designed to improve sensory, motor, and autonomic function, health, and quality of life. When we're doing locomotor training with someone, we provide very specific sensory cues to re-train the neural patterns that will hopefully result in effective locomotion. And it's really the emphasis on LT training is the recovery of motor function using the intrinsic mechanisms of the nervous system rather than compensatory strategies. So, we really try to maximize just normal kinematics of how the body moves versus using compensatory techniques.

[00:05:23] So here's a little guy on a treadmill and body weight support harness. You can see the therapists are helping to support his knee at the quad, which we use for knee extension while we're standing. So, the four principles of LT will be to maximize weight bearing through the legs. We're going to optimize our sensory cues, so we do, like I said, very specific tactile cues while we're walking to provide it to the appropriate muscle that's supposed to be activated at that time. We're going to optimize our kinematics for each motor task. We're just trying to normalize the movement and minimize compensation.

[00:05:55] We do this with treadmill training, over ground training and then hopefully we integrate this into community training. There's going to be a little quick video here. Let's see if I can get it to work. Nope, it wants to be difficult. Well, the one on the left was going to be locomotor training where a therapist is positioned at

each leg and they're providing, they are helping the patient take steps while the treadmill is moving. And then the one on the right is a robotic gait trainer while, that also uses FES. So, the patient is performing repetitive stepping while they're getting electrical stimulation to their legs. Oh, wait. Here we go.

[00:06:44] It's a very quick video.

[00:06:51] They're essentially trying to cue quad during sling phase. They're trying to hit the hamstring and they're just trying to normalize his weight bearing posture as much as possible. And here on the right we have the robot sort of helping him move the legs for us. We're using electrical stimulation to facilitate the correct muscle to the correct time. And a therapist can also be in the position in front to help facilitate knee extension or whatever the patient may need as well.

[00:07:18] **Kaitlin Hagen:** So, the fourth component of ABRT are the - of the main ones - is massed practice. So, this is just repetitive task specific and non-task specific practices. So basically, you're doing the activity over and over and over again so the nervous system remembers what those muscles should be doing. And so, the key part of this is that we're helping from an occupational or physical therapy standpoint we're helping to teach the nervous system how to move in the appropriate way and not using compensatory technique.

[00:07:54] So this kind of incorporates LT, like what you saw with Dennis' videos, but also you see the little boy here has his upper extremity hanging in a gravity eliminated plane so we can try to get him to use his arm over and over again in an easier plane to re-teach his arm how to move. And the fifth part of ABRT is task specific practice. So, this is very goal directed and also incorporates a lot of repetition. We're going to be utilizing different components of ABRT, so as an OT for example, if the task that I'm trying to get the patient to do is brushing his or her teeth, we might incorporate standing at the sink to try to get him weight bearing through the legs while also working on brushing his teeth.

[00:08:42] We also might have to break down the task depending on the patient's abilities, so maybe just bringing the hands to the mouth is something we would do over and over again in preparation for getting to brushing his teeth or eating or whatever the task is. The main part of ABRT is trying to use the muscles and not allowing the nervous system to just lose that muscle mass and lose those muscles. So that is the main purpose of ABRT. There's many other little factors like we mentioned aquatic therapy is another way to kind of get us to allow the body to use the muscles in different areas but also, it's important to remember that using the muscles the correct way is really the purpose of ABRT.

[00:09:40] And that's what OT and PT can help. But the most important thing is activity. And so, over the course of a lifespan, obviously patients cannot be in therapy all the time. We want people to transition back normal life. And so, a home program is really important and just getting active in the home, community, school, being as active as possible is a great way to continue to utilize and get recovery and keep the body healthy. And like Dennis said, ABRT can be used across the lifespan for kids and adults. We just happen to use a lot of kids in the pictures and videos today.

[00:10:19] ABRT is a lot of hours of therapy when you're doing it intensely, and so for kids you often have to get creative, really involve the family and another factor is that as children, specifically age, they may have to come back for therapy to learn new skills that are age appropriate as they continue to get older. So those are the kind of the very, very brief overview of ABRT, which is the therapy that we utilize at Kennedy Krieger. So now we can just open up the floor to questions as we know this is mostly a Q and A, so.

[00:10:56] **GG deFiebre, PhD:** Hi. Thank you for that great overview. I have a question to start. So, I think sometimes people when they first start in therapy are told that occupational therapists deal with the arms

and physical therapist deal with the legs. That's, I would say something that's said a lot. So how is that different than where you are and how do you work together as a team when dealing with a particular patient?

[00:11:24] **Kaitlin Hagen:** That's a great question. So, I would say that's like a general way that people divide it up and we often will divide it up that way just to make it easier in our communication so we're not doing the same things. But I think the important thing is to remember if you can walk but you can't get yourself dressed or can't open the door to get out the door, you know, that's kind of a key way to show that PT who might work on walking and OT who might work on getting dressed or helping to open the door. They really are a team effort and so I think that's really the important factor there.

[00:12:01] There is definitely a lot of overlap in what we do, but I have to say as an OT, like, I'm not going to focus on locomotor training as much as, like, Dennis would as a PT. So that is something where there is some differences. But I may work on the legs, weight bearing or having a patient standing while I'm working on upper extremity tasks to try to incorporate the whole body into our session.

[00:12:26] **GG deFiebre, PhD:** I was going to ask Dennis if he had anything to add to that.

[00:12:31] **Dr. Dennis Tom-Wigfield:** Yeah, sure. And so, we, you know, as a PT, we definitely try to treat the person, you know, treat their whole body. We don't try to just only focus on one little thing. So, we have, at least here we have really good communication between the PTs and the OTs to see what they did during their sessions, to see if there's any concerns we may have. You know, with training people to walk again, they're oftentimes using their arms a lot for a support on assisted devices. So, if they're struggling with, like, shoulder pain or wrist issues or whatever else, that's something I need to know about and that's definitely something I'm going to talk with the OT about. So, we can really sort of collaborate and, you know, just focus on the big picture, and work together that way.

[00:13:12] **GG deFiebre, PhD:** Great, thank you. And then what about your kind of communications potentially with someone's physician, like a podiatrist or something who might be the one who, you know, potentially prescribes going to see a physical or occupational therapist?

[00:13:28] **Kaitlin Hagen:** So, in our particular center, we have a medical team that is involved with every patient, so that is part of our interdisciplinary team. And I think a really important part of it because things like tone and different medical issues can really impact the therapy. We definitely, in our particular clinic, I think the doctors then talk to other outside doctors of patients if needed and as needed. But I think that's definitely a very important part.

[00:14:01] **Dr. Dennis Tom-Wigfield:** It looks like there's a question in the Q and A.

[00:14:04] **GG deFiebre, PhD:** Yes, got it.

[00:14:05] Yeah, so this person is asking about I guess banding around their ankles and arches and waist. Is there any kind of good therapy that can be done for that banding sensation?

[00:14:17] **Dr. Dennis Tom-Wigfield:** So, let's say I'm assuming that you mean the sensation of banding. And so, there is. We, in therapy we can use Kinesio Tape as a sort of sensory cue to sort of try to mask that banding sensation. We also use electrical stimulation a lot. Not only for the strengthening component, but also for sensory issues as well. It's sort of one of those things where you have to trial it and see if it works for you. Some people respond really great to it and, you know, it really kind of resolves some of those weird sensory things and other people not as much. So, I would definitely try what's called TENS electrical stimulation or as well as Kinesio Taping.

[00:14:57] **GG deFiebre, PhD:** All right, thank you. And then we've got another question. Someone was released from neurological PT after a year. They've been doing fairly well. Their gait is not perfect, but they're working on it. Do you kind of generally recommend that someone see a podiatrist to help with potential nerve pain and have you done anything with scrambler therapy as a type of pain management?

[00:15:23] **Dr. Dennis Tom-Wigfield:** Well, I'd definitely follow up with your podiatrist or neurologist regarding the nerve pain. That medical treatment side is going to be definitely a big component of that. Scrambler therapy is like, I've heard of it before, but I can't quite think of what it is right now. Kaitlin, do you know more about that?

[00:15:42] **Kaitlin Hagen:** I don't. I was actually just looking it up to see if I could get a better definition to see if there's multiple names or something for it.

[00:15:49] **Dr. Dennis Tom-Wigfield:** If you just did like a full year of therapy, I would probably recommend again trying, you know, doing things at home for a while. Give your body some time to maybe rest from that intensive therapy. See how much more your nerves recover in the next few months and then I'd actually go back to physical therapy. Just so they can try to progress you even further from where you were a few months ago. That's kind of what we do here a lot, especially for those acute injuries where you start out with a very intensive bout and then we bring people back, you know, 3 to 4 months after having breaks from therapies.

[00:16:22] **GG deFiebre, PhD:** Great, thank you. So, you know, we talked a lot about activity and the importance of activity. But if someone also, you know, someone needs a wheelchair or some other kind of mobility equipment, who typically kind of deals with getting someone fitted for something like a wheelchair or any other sort of mobility stuff like in the shower or stuff like that? Is that kind of a combination of OT and PT or how does that work?

[00:16:51] **Kaitlin Hagen:** Yeah, I would say for the wheelchair, you definitely want an assistive technology professional or an ATP to be working with you. At our clinic we tend to use, most of them are physical therapists, but it could be an occupational therapist as well. And then you're paired up with an ATP from your vendor side so that way you have kind of two sets of eyes who are skilled looking at that because the wheelchair is a super, super important thing that we get right to make sure it fits you well to prevent any other musculoskeletal type of problems or pain and that sort of thing. As far as, like, shower equipment and stuff, typically OTs are able to help with that. Bracing is definitely an OT or PT type of thing, so definitely an interdisciplinary approach there too.

[00:17:40] **GG deFiebre, PhD:** Thank you. And then as we're getting to the end of our time, kind of any last thoughts or anything you want to kind of end the conversation with? I'll start with Kaitlin.

[00:17:52] **Kaitlin Hagen:** I would just say, you know, I think finding a balance between therapy and living your life is super important and something that we're really trying to re-emphasize with people to try to make sure that you're living your life as full as possible while also getting therapy as you need it as you continue to progress, so.

[00:18:12] **GG deFiebre, PhD:** Great, thank you. And, Dennis?

[00:18:15] **Dr. Dennis Tom-Wigfield:** One of, like, the most common things I hear when I get a new patient especially, is that someone has told them that 6 months after their injury, whatever, however they get it, they're going to see no more neural recovery. Nowadays we just know that not to be true. Typically, at our clinic we say up to 2 years after your event is when you could see the most recovery, but people even past

that 2-year mark have the potential for seeing changes. It just may not be quite as quickly as right after injury. But yeah, the whole 6-month idea I think is false.

[00:18:44] **Kaitlin Hagen:** Old school, yeah.

[00:18:46] **Dr. Dennis Tom-Wigfield:** Old school, yes, so stay active. Work on recovery. Work on integrating back into the community and everything, yeah.

[00:18:58] **GG deFiebre, PhD:** Great. Well, thank you, both, so much for your time. We really appreciate it.

[00:19:03] **Kaitlin Hagen:** Thanks for having us.

[00:19:04] **Dr. Dennis Tom-Wigfield:** Thank you.

[00:19:04] **GG deFiebre, PhD:** Thank you. And so, for everyone, at exactly 3 there will be a break and then followed by a talk on the stage at 3:10 about adaptation, mobility equipment, all of that. So, thank you so much.