Do-Re-Mi For the SLP:
Considering Elements of Music in Treatment
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- [Amy] All right, well hello and welcome to today's speechpathology.com webinar with Becky Mitchum. She is going to be presenting Do-Re-Mi for the SLP, considering elements of music in treatment. Becky Mitchum is a speech-language pathologist, currently serving on the rehab team of the White River Medical Center Hospital outpatient clinic in Batesville, Arkansas. In addition to being an SLP, Becky has over 25 years as a professional violinist. She's a member of the American speech-language Hearing Association and the American Hypnotherapy Association. She holds the credentials of certified brain injury specialist through the Brain Injury Association of America. So, welcome Becky, it's a pleasure to have you with us today, and you can go ahead and get started.

- [Becky] All right, thank you very much. I really am looking forward to this. I wanna thank you guys for joining me. This is something I'm so intrigued about. This topic of incorporating music into speech-language therapy treatment. Music has these diffuse neural connections to so many brain systems, and I think that should matter to us as speech-language pathologists. So, I am Becky Mitchum. This is my second career. I'm what you call a new old speech therapist. I've been a speech-language pathologist for about 6 years, but I have played the violin for, gosh, half a century, 50 years. I started to learn to play the violin the quote unquote traditional way, which is very left hemisphere, very rule governed, very segmented. And then when my daughter was little I tried to teach her, and the only way I knew how to teach was the way I had been taught. Didn't go well. She said she'd rather eat dirt than play the violin, and I said you can do both. So it just kinda went downhill from there. So I ended up hiring a colleague in the symphony to teach my daughter violin. And my friend used the Suzuki way to teach violin, which I found out is Japanese pedagogy for teaching children as young as three how to play the violin. So, the Suzuki method is very right hemisphere, very integrated, very intuitive. Children learn by ear and then we introduce the written symbol system. It's a lot like how we acquire language. So I found out that the Suzuki

method is called the Mother Tongue method because of this. And it so inspired me that I went on and I got formal training myself to teach violin using the Suzuki method. And I have to say that changed everything for me. Seeing my students acquire musical skills the way children acquire language skills was a game changer for me, and that was the beginning of my interest in speech-language pathology. I can't really separate my love of music from my love of languages because I saw through my Suzuki training how the two were so intertwined.

I was born in New Guinea, where there's the primary dialect is pidgin English, and then as an adult later, I lived in Germany where my receptive language far outstripped my expressive language for a long time. So, I remember what it's like to not be fluent in a language, to yearn to comprehend, as well as speak and interact with people around me. And I also still remember what it was like to be learning my violin, to not be fluent on my violin. So there's a quote by Wittgenstein, and it says, the limits of my language are the limits of my world. And that quote says it all for me, it's my motivation for being a speech-language pathologist. We help loosen the limits of someone's language so that person's world can expand. And music can help us do that, with its vast neural networks, it co-activates so many systems in the brain. It can be a powerful tool for us as speech-language pathologist's to help our clients loosen the limits of their language, to loosen the limits of their world.

So, let's go through these initial slides, you'll see what the disclosures are. So let's look at the initial slides here to show you the disclosures, and then go on ahead to the learning outcomes. So, I have three broad stroke summary concepts for how music can be helpful to a speech-language pathologist. So I call them receive, retrieve and retain. So, speech pathologists can use elements of music to help our clients receive the therapy content by training their attention, or improving their moods, so they're receptive to learning. We can also use music to help our clients retrieve therapy content because music links the auditory system to other systems. And so, music can

actually co-activate multiple systems, making associations which facilitate memory. We can also use music to help our clients retain their therapy content, because music can regulate emotions which regulate the strength of memory consolidation. And I also defend how these are within our scope of practice. Music facilitates cognition by virtue of its widespread neural networks, and speech pathologists are all about cognitive linguistic barriers. There's also an obvious reason why speech pathologists can use music and elements of music, and that is that there are no copyright, or there are no copyright rules on musical instruments, or musical elements. So musicians and musical therapists, music therapists, they don't have an exclusive right to these. So long as we know the why, that we're tying the music or the musical element to a speech therapy goal, and we understand how to use it, just like we do with any other tool we use, then we are within our rights to use music in our treatment sessions.

The second learning outcome is comprehension. I summarize in this course ways that you can vary five elements of music, specifically to train attention. And the third learner outcome is application. We all know that there's no one size fits all treatment tool, but, I'm hoping that you'll be inspired by an activity here, or a concept you can tweak to help at least one person on your caseload right now. All right, so let's look at the documents. I've given you a lot of documents to download. All I need to say about them is that they'll be better in color. The brain train activity must be in color because the color is key to the task. But if you use a dye based printer, just know that it is gonna get ruined if you run it through a laminator. So, you're going to need a laser printer. If you aren't sure what you printed them on already, just use page protectors and you should be okay. All right, so the elements of music I refer to in this course are listed on this slide. Speech-language pathologists can use all of these without any special musical training, except the last one, the written symbol system of music. There's an activity I include in the 10 page document of activities. We're only gonna go over four in this webinar, but you have 10 pages of activities, and the last one on there can be a fun language music game to practice sound symbol relationships, and

encoding and decoding. But it's only going to be relevant if you have a student who's also in music classes, or lessons, and is learning to read music. Every note has an alphabet letter, so if you, as the speech therapist, are fluent in note reading, and if your student is reading notes, then the symbol system for one can support the other. So you can have fun encoding or decoding real words, or nonsensical words on a musical staff and playing it for them.

So for example, bed sounds like this. B-E-D. Or, let's do cage, C-A-G-E. So it can be a very fun activity, but only, obviously, if you have had training in note reading yourself, and only if it ties in, obviously, with your student's objectives. So, that's the only one that you would need special training for. So, you have to always consider that not every speech therapist is going to be appropriate to use every activity, and not every client will be appropriate. It's just like any other tool. If you're not facile in it, then don't try to use it. And if your client has these issues, making them sensory aversive, or any other reason, you have to always take into consideration your expertise, your comfort or familiarity with the musical treatment tool, and then also obviously always take into consideration our clients' sensory, motor and cognitive barriers as well.

Okay, so, the rest of the course is gonna unfold like this, I see it like this. We're going to consider cognition, and the role that music plays, no pun intended. We will unpack the difference between a music therapist, and a speech-language pathologist using music. And we'll look at some ways that music and language share processes in the brain. I briefly will bring Einstein into the discussion. He's somebody who's very famous, and yet not known for music, and yet he was a musician. So, that's relevant here. And I will talk about his brain as a chocolate chip cookie. So from there, I want to introduce you to four current music neuroscientists that I am especially fond of. These are among the seminal authors you're going to want to know if this topic of music and language interests you at all. One of them has written about what he calls the OPERA hypothesis. We're gonna go over that briefly, and then that will segue into attention and

memory, which I hope will set up the value in some of the therapy activities I'll offer. In one of these activities, I'm going to help you understand ways to vary five elements of music to specifically train attention. The course will be over once we've covered all four therapy activities, which connect what we do to some aspect of music. But there are many remaining slides we won't cover, but which I hope you'll hang on to for future reference, if you have deeper interest in this. I called the slides for you treasures for future perspective. I'm sorry, treasures-- Treasures for future reference. They're my gift to you. They not only have my references for further study which are good references, but also journals you can subscribe to about music and medicine, or trainings you can get like neurologic music therapy training, and organizations you can join, or links to TED talks by the four music neuroscientists I'll introduce you to. And even links to vintage photos of Einstein playing his violin.

So, treasures for future reference should be a solid starting place for those of you who want more. Okay, so, cognition is defined by me here as, let me get a drink here, I'm sorry. As information processing through thinking. So, what is metacognition then? Well, it's thinking about thinking, self awareness, which I argue, we have to have to train our attention. So if you go ahead to the slide, let me get the arrow here. If you go ahead to the slide showing the potters wheel, the potter forming something on his wheel. That's my metaphor for cognition. I consider the unformed raw clay to be incoming information.

That could be a therapy session, or what you're trying to teach, but it's the incoming information, raw clay. The two hands represent the two hemispheres of our brain taking that information to shape it, manipulated it, form it into something as it spins on the potters wheel, which is thinking. What is formed is then, let's say it's a bowl, or a vase, or a plate, that represents the products of cognition. So that could be creating memories, retrieving memories, trained attention, inferencing, predicting, executive function, social pragmatics. All those speech-language pathology objectives that we

target. So those are the products of cognition in this metaphor. And I challenge you to think how music might fit into that schema. So, remember how I said that music can co-activate multiple neural systems? So, in this schema of pottery, representing the products of cognition, music is a facilitator of the outcomes. So music can help train the potter, if you will, the potter's attention, so a task gets finished. It can help prepare a client to learn and absorb, it can down-regulate a too hyper client, or up-regulate a too drowsy client. We can manipulate music in our sessions, and elements of music, to be facilitators in the treatment sessions, in the products of cognition. So the next slide shows this Venn diagram, and I just really feel that all disciplines should be able to use music, or elements of music, because all disciplines intersect at cognition, and music facilitates cognition.

All right, so, let's talk about the difference between a music therapist and a speech-language pathologist using music or elements of music. Music therapy is a, it is an accredited healthcare profession with credentials. The entry level degree to practice music therapy is a bachelors degree. Of course, you can get higher degrees too, but the entry level is a bachelors degree. There is a woman, Kathleen Howard, with a PhD, who presents through speechpathology.com. She presents a great course on music, specifically for autism.

She is a speech-language pathologist and a credentialed music therapist, and she teaches at Berkeley. So, in Boston, I believe. So, you can get higher degrees in music therapy, but the entry level is a bachelors degree. And I've given you the website for the certification board for music therapists if you are curious to find out more. The main takeaway nugget here is that music therapy is a credentialed profession, and music therapist should be a protected title. I'm a violinist, but I would never call myself a music therapist. We as speech-language pathologists can absolutely use music and elements of music in our therapy as tools, so long as we are mindful of the how and why, what we're doing. It does not make us a music therapist, and we shouldn't think

of ourselves that way, by using music. We are speech-language pathologists using music as a tool. So, this is one way we can be mindful of staying in our scope of practice. So, as long as we can tie the how and the why of what we're doing, tying it to a speech therapy objective, then that's how to be mindful of our scope of practice, and then we do not need to collaborate with a music therapist, or be trained in music therapy. Let me just say quickly, that being said, I do think our clients benefit most from interprofessional collaboration. But, I know, not all service delivery models allow that. I'm simply saying collaboration is not a requirement for us to use music or elements of music, we just need to be clear on our professional parameters, and that's true of any tool that we use.

All right, let's look at incorporating music in our therapy sessions. It can be a natural pairing if you consider how music and language overlap in the brain. So let's look at the slides outlining some of the similarities. We know, as music therapists, about language development. We know that spontaneous speech and spontaneous singing, typically develop in children at about the same age, and that there's this amazing language burst at a certain point in time, and that's when they start exploring three to five word sentences, and they can start singing little rhymes, and repeating rhymes. And both music and language are acquired hierarchically, and they're universal, every culture has some form of music.

So, music and language share these elements. Let's look also at these charts that show these dual hemisphere processes. I have two charts, one is the left hemisphere, showing the language characteristics and the music characteristics. And you can see how we've got that, in the left hemisphere we have segmented pitches, segmented blends, syllables. It's very rule governed. We have time signatures versus syntax. There is musical grammar, just like there is language grammar. And then consider the right hemisphere. So, I learned to play with my left hemisphere primarily, but it's the right hemisphere that expresses creativity and is intuitive and is, let's say, dominant for

making and recognizing facial expressions and making it possible to convey the prosody in speech. We know, if you've ever worked with somebody with a right hemisphere stroke damage, you know often there is flat affect, and they also have a very hard time reading affect in others. All right, so I do talk about Einstein here because he is, yes, he's a famous scientist, but also because he was a violinist. There's a quote by a pianist named Liam Viney, and he says, "Music inspired and guided Einstein, "music stimulated parts of his brain "that could not be accessed by sitting at a desk." So music inspired the thought processes of Albert Einstein. That's pretty amazing to me. We're all speech-language pathologist here, so I don't think there's a need to refresh the terminology. Let's just jump in and say that neurons are represented by chocolate chips.

Let's go to that slide. And, glial cells are represented by cookie dough. So they did this autopsy on Einstein's brain, and it revealed that it is not the chocolate chip neurons he had more of than most people. It was the glia, the cookie dough that Einstein had much more of than most people. It's the cookie dough that holds it all together, that connects things. So I envision music to be like Einstein's glial cells, linking one neural system to another, co-activating multiple processes and making associations. The four neuroscientists I told you about earlier that I'd love for you to know more about are Dr. Aniruddh Patel, Dr. Daniel Levitin, Dr. Gottfried Schlaug and Dr. Michael Thaut. There are many more than these, but these are four of my favorites.

These are current. Dr. Patel, we're gonna talk more about later with his OPERA hypothesis, he's at Tufts. What I think is fascinating about these guys is that they all either were or still are musicians. Dr. Patel, I think, had piano as his instrument, I can't prove that, but I seem to recall watching one of his TED talks where he played the piano. And I love the quotes attributed to each of these people. Dr. Daniel Levitin was actually a rock guitar player in a band before he became a neuroscientist. He's at McGill University. And I love this quote, "Actively participating in music exercises parts

of the brain that are shared in language processing." Gottfried Schlaug is a big name in this area. He's out east at the Harvard Medical School, Beth Israel, and he has done some amazing work with aphasia. He has something that is similar to melodic intonation therapy. You can read more about it, but I love this quote, "Because it is multimodal, "music helps us develop or engage more associations "in the brain." Dr. Michael Thaut was a violinist in Germany and he still plays violin. He's now up north in Toronto, but he started out in Colorado with his wife. And so, his whole theory is that music, sorry, that rhythm is the harness to learning.

Now he is the quote unquote father of neurologic music therapy, or NMT, that has been on my bucket list to get trained in for about eight years. I was scheduled and registered to go to Houston in March to start my training, and then it all got canceled because of the Coronavirus. So, you don't have to be a music therapist to get trained in that, and this is one of the links in my treasures for future reference for you. All right, the OPERA hypothesis. This is an acronym for Dr. Patel's OPERA hypothesis, right. It has nothing to do with a fat soprano, I just drew her to be a visual symbol or an icon to help you remember the five principles of neuroplasticity that Dr. Patel says, or he proposes that those are the principles that use musical elements to help speech processing networks.

And he does make the difference between listening to music and making music. And his actual, I'm stretching his hypothesis a little bit. His hypothesis is that making music structurally changes the brain more than just listening to it. All right, so here are the principles of his OPERA hypothesis. So we have overlap. We know that there is anatomical overlap in the brain networks that process acoustic features used in both music and speech. This one's showing music as an arrow, splitting the arrow of language, talks about precision. P is for precision. And so, they both are hitting the bullseye, but one is a more precise hit. So, Dr. Patel believes that music places higher demands on shared neural networks than speech or language alone, in terms of the

precision of processing. E is for emotion. Music activities that engage this network elicits strong emotions. So, positive emotions are more beneficial to us as therapists. If we can use music to modify or regulate a client's mood, then that client may become more receptive to learning the therapy content. R is for repeat, repetition. Musical elements are frequently repeated. We know that repetition builds stronger neural pathways, and melodies lend themselves to repetition. And attention. Basically, we cannot acquire what we can't attend to. So, it's important to train attention. Attention and memory are the bookends to all learning. So, we can use music or elements of music to train our clients' attentions for better outcomes. So that is the flyby or the fly over of Dr. Patel's OPERA hypothesis, and that's, this article that goes into it in much more detail, is in my references.

All right, here is my thermometer that I use. It is based on the Sohlberg and Mateer clinical model of attention. I like metaphors, you can tell. And I think a thermometer, while it is an abstract concept, and I used this primarily with children, it can help some children understand that we don't get to divided attention, the highest level, and stay there the rest of our lives. We all dip and climb across time with our attention. So, it is so important to me that my clients understand well, why am I not doing well? Well, I'm sleepy, well, I'm upset because--

So, I have this laminated, and we put little superheroes on it and move it up and down as we talk about what the different levels of attention are, as we try to train that self awareness. Then, on the next slide, is a chart that I use to help train self awareness in teens and adults. I cue them to the skill that we're going to be rating that session, so that they are keyed into it, and then after this session, and so that's what goes in the line under skill there in that column. Then after the session I have them rate himself before I rate him. If there's more than one digit difference in our ratings, we talk about why. And, if the numbers are the same, we also talk about why for reinforcement. All right, music. So, attention and memory, let me just wrap that part up by saying there's

such important skills across the lifespan. Music can help modulate memories, music and help modulate emotions. And the reason that should matter to us as speech pathologists, is because emotions regulate the strength of memory consolidation and help with attention maintenance. So, if we are, let's say happy, optimistic, upbeat, then incoming information gets to the amygdala in our limbic system, which sends it on to our hippocampus, where it can be consolidated into long-term memory in our sleep, and that's learning. But if we're sad or angry or anxious, then the information may get to the amygdala, but it never makes it to the hippocampus for consolidation. Forgive the crude Reader's Digest version of all of that, it is actually a neural miracle.

This was just a simple way to explain why using music or elements of music in speech-language therapy can provide neural enrichment for our therapy which can help our clients' moods and receptivity to what we're trying to do. All right, I had the most fun drawing the negative silhouette of the left hemisphere in a woman's head. I can intuitively get that music makes me happy or calm, but I love to see that there is actual cortical real estate in my brain devoted to these emotional responses to music. I labeled two of the structures in our brain that are active in our emotional responses to music.

These aren't the only, let's say, reward centers, if you will, but they are two important structures in our brain which are dopamine receptor rich. That is the nucleus accumbens and the amygdala. All right, finally, the four activities, Do-Re-Mi for the SLP, considering elements of music in treatment. Activity number one is rhythmic entrainment. This is for babies using a metronome to facilitate a more organized, rhythmic suckle. So a non-nutritive suckle that is more rhythmic, more regular sucks and sucking bursts. It's been shown to be highly predictive of a shorter transition to full oral feeding. And then a friend of mine out east, a speech therapist named Anne Collegiate put me onto this article that is also referenced in your slide there. Let's get to that one so you can see it. Yeah, by Wren and associates, that's also cited in my

references, talks about delayed development of motor skills that include feeding skills, is a risk factor for persistent speech sound disorders at eight. So, I know that correlation is not causation, but, an unorganized, non-nutritive suckle could be a red flag to alert us for early intervention. So, you'll need a metronome or a metronome app, and a pacifier. You'll set the metronome rhythm to about one tick per second, like a heartbeat, and you'll gently press in with each tick, and release pressure between ticks. So, the pacifier goes in the child's mouth, in, out, in, out. Singing along with this, it's a nice steady beat, and singing then can pair the ticking rhythm with the melody, and also soothe the baby. All right, brain train, using elements of music to train attention. This is for children, really children through adults.

This is one of my favorite activities. I give you four different charts twice because one is a key with the answers on it. So there are four different charts. Each one increases in complexity. We have one through 20, one through 30, one through 40, one through 50. So, one through 20, let's see if I have a picture of it. All right, so one through 20 has numbers scattered randomly across the four colored columns. I know your slides are probably not in color, but it's blue, red, green and yellow, because primary colors are easier.

And then I have the client, on a blank sheet of paper, write vertically one through 20. I instruct him to indicate the color of the column beside each of the numbers he just wrote. I tell him I'm going to time him and that there are two time saving strategies that he might discover. So one, of course, is writing just the first letter of the color instead of the whole word, and the other time saving strategy is to go colored column by colored column, rather than trying to scan across all four columns chronologically. So, I think I have an actual schedule here, right. And I do have a trial page for you to train them on to see if this is an appropriate activity. So, you'll give each set consecutively harder to him twice, one week apart. The first time with no distractions. The next week you'll give him the same set, but this time you'll add distractions. I use auditory distractions

because the auditory system links to so many others. I use environmental noises that you can download, and sometimes on top of that, I use elements of music or sometimes just music, but always music. So let's say you start out with one through 20, no distractions. The next week you'll give one through 20 again. But, with distractions. One through 30, then the next week, no distractions, the next week one through 30 with distractions. And so each set becomes more complicated. There are more numbers in different sizes and fonts, some sets begin to show symbols thrown in as red herrings.

By the time you get to the hardest set, one through 50, there are words and colored phrases mixed in the columns too. The way you're gonna take data on this is the length of time to complete each set. How many errors? That's why I provide you with a key for each one. And then note how long it took him to discover the time saving strategies. What you're hoping to see is a decrease in the amount of time without distractions, and the amount of time with distractions on each set. So, if you start at one through 20 and go all the way to one through 50, it takes eight weeks at once a week. And here are some ways to vary those musical distractors.

Lyrics. It is more demanding, cognitively, to use music with words, than simply instrumental music. Volume. You can increase or vary the volume. That is going to be more distracting than if you keep it at a steady volume. Always be sensitive to what is averse to your client, you don't want it painfully loud. Tempo. That's-- Oops, I need to go back. Tempo is another way to vary. You can increase it or decrease it depending on what you're trying to accomplish, or just to distract them. Rhythm is another one. A steady, predictable beat is more cognitively engaging, and here I say distracting, than using arrhythmic sequences. Duration of one pitch. Changing it, altering the duration. So, instead of one long single pitch, ooh, if you were to vary the duration of a single pitch, ooh ooh ooh ooh ooh ooh, that's going to create a higher demand on attention. All right, activity number three is called crayon violin. This is a free app and I get a lot of

use out of this one. It can be used for various therapy objectives, but I use it to practice social skills. It can be for children and adults, because the music on the menu has selections that appeal to a variety of ages. So, I drew it on your slides. Let me see here. The screen is slightly divided. That's what the app looks like. The screen is slightly divided. It's got three circles on the left and three on the right for two players. So partners have to work together to select a tune from the drop down menu, and then when someone taps the screen to start, these colored circles begin to fall in patterns which created a melody. If the players tap the colored circles exactly as they line up with the blank circles.

I'm gonna show you what that looks like when it's being played. And I'm gonna, in this sample, I'll intentionally miss tapping the light green circle so you can hear what happens. It's very irritating when your partner misses because you're both working together to produce a single melody. All right, here we go. Can we pull up the video? All right, we can go back to our slides. And so, that's crayon violin. And there are all kinds of things we can do to expand this. I have used it as part of a full language social skills unit, where two clients put on mini concerts. It's a short concert 'cause these are little pieces.

But, they had to pick a recital date, they had to gauge whether they could have it prepared by then. They had to work together to decide where to have it, which sometimes required getting on the telephone, phone skills, and then they had to decide how to dress, and who will design the flyer, and what will it look like. And they invited friends to greet people as they arrive, and they had a guest book that people would sign with addresses, so, the kids or adults could follow up writing thank you for coming notes and addressing envelopes. And if you have access to a kitchen, the clients can bake cookies for a little reception afterwards. And, now you've incorporated following recipes and sequencing. So, there's so much to do with two clients and this one free app. I love this little app. All right, so that was your third activity. It is best for two

clients. It can be you and an adult, or you and a child. And you saw me trying it by myself. You can do that, but it's difficult. Okay, so the fourth activity is respiration muscle training, RMT, and upper body stretches. This is for adolescents and adults. The way I tie this in is that respiration and simple stretches help support the melody of speech in speech language pathology, the prosody. So we know that, and this is one of your downloads, that you're welcome to to have. So, we know that respiration is the driving force for all speech. So, if you have respiration at the bottom and you see prosody at the very top, if the client has trouble at the level of respiration, he or she will likely have trouble with speech characteristics above it.

So this respiration muscle training and upper body stretching is, it's got two dials, one for inhalation and one for exhalation, and it is, where we get the best bang for our buck, is in resistance. You know, those hospital's spirometers where you inhale and that little styrofoam ball rises? It's definitely better than nothing, absolutely better than nothing. But there's no resistance. So this can be uniquely calibrated. Sometimes a person may feel like, okay, I'm ready to go up to level three on inhalation, but my exhalation still needs to be at level two. So you can do that. The mouthpiece, it comes with two different mouthpieces.

The one shown here is more for somebody who has weak anterior lip seal, and the other one is more rounded. I gave you the website there, you can go, just like I recommend to my clients to go and watch the tutorials on it. This little device costs about $45. I asked a local pharmacy to start carrying them so my clients don't have to pay shipping. All right, so, it is the resistance that we're going for, and if they work this program, I tell you, it does make a difference. So this is one simple thing that a client can do from home and continue doing when he or she discharges to maintain speech therapy and voice therapy gains. Again, remember, respiration is the driving force, and part of that, part and parcel is posture, right. So, if we can get them where this is a habit that begins in therapy, they're gonna be much more successful when they

discharge. And, I've been fortunate to work with some excellent therapists who began thinking about discharge from the very beginning when a client admits. And that wasn't my mindset. As a violin teacher, I would take a child, really from the cradle to the grave basically. I mean, you would teach a child clear through college if you started them when they were three. So, I mean that's an option. But, my mindset was different. And when you are in therapy, you know you're not going to have them their whole life. You have to help them become their own speech therapist. And part of that is the attention training, the metacognition.

And part of it are simple things like this that they might become so dependent on us in their therapy and then feel completely lost when they discharge. So, I always ask them to get a clearance from a physician first. I tell them where they can buy the respiratory trainer, it's called the breather. And, then I give them the website and I asked them to go home and just look through the website, watch the training videos, and then when they come back to their next session, we start going through it together, and I help them learn how to chart in a journal, is what the website calls it. They call it a journal, I call it a log, so that you can be charting your progress. It's a 12 week program. So, three months.

And I'm telling you if we can get them started in therapy doing this, and correcting their posture, whether they're in a wheelchair or not, this makes so much difference in their speech. And let's not also forget that oxygen, when we are working on respiratory muscle training and breathing and upper body stretches, this is bringing more oxygen to the brain which helps support cognition, and we are all about cognition. So this is a visual aid that I made and I use for my clients. I usually color in the cartilage, where the voice box is. But I show this to them because sometimes they don't understand why raising their arms has anything to do with their speaking. But if they can see the origin and insertion of these muscles that go in, around and through and over the cartilage for their voice boxes, they're much more likely to be compliant. So I use this as a visual aid

for patient education, but also for caregivers, if it's a younger person. And this is another drawing just trying to explain to them what happens. If you breathe in, the diaphragm comes down, you're expanding the thoracic cavity. I want them to see that what they're doing, because breathing, it's not an invisible task, but they don't understand always what's going on internally, and why I'm asking them to do these things, and it does impact speech and language. So, visual aids, I think, are always a good part of the respiratory muscle training are these upper body stretches. So, I did not come up with the Y-W-L-T. This is modified from someone named David Oliver, Dr. David Oliver. He calls it you will live tall. Because, each of these poses represents a letter of the alphabet. So, I start out, first we talk about this forward position that so many of us have with our heads. I see it even in young people because of texting. And we're on our computers.

And I find myself, when I'm driving, my shoulders go up, my head goes forward. So, one thing I learned in my neurodevelopmental treatment training is that for every inch our head is out of alignment, is forward and not in a neutral position, this add 10 pounds of strain and stress to these muscles. So, a simple way to bring our head back into alignment, as I have them put their two fingers on their chin, and to look across the room at eye level, and then simply push their chin back gently so that their head is in a more neutral position.

And I have it illustrated there for them. And we do this every session, every session, so that hopefully by the time they discharge, this will be something they can do, not even thinking about it. So the first position is called Y, or this would be the you, you will live tall, in that. So this is the Y position. So, our hands are up in a praise pose with our palms up, and immediately, even with me, what happens is, my shoulders wanna come up. That creates tension. So I tell my clients, be aware, and I have a mirror we use in the gym. Watch your shoulders, feel your shoulders, and then imagine your shoulder blades and back. We wanna bring the shoulder blades more together, so you're

stretching and expanding your thoracic cavity. And then we take two deep belly breaths from our diaphragm, deep in and out. And then we go from the Y pose, with shoulders down, and head in neutral position, to the W. So it's almost like someone is robbing you from behind with a gun, like stick 'em up. So, you're in this W, and your palms are open. Again, be aware of your shoulders down, and your head is in a neutral position. You're gonna bring those shoulder blades back as far as you can. And we're gonna take two deep breaths together. Diaphragmatic breathing. Then from the W we go to L, which is you're bringing your elbows down to the side, you're perpendicular, your forearms should be perpendicular to the floor.

And I do it with palms up. And I tell my clients, I imagine somebody behind me taking my two thumbs and gently pulling them to the back. So that reminds me to bring my shoulder blades together. I'm expanding that thoracic cavity again, and my head's in a neutral position, my shoulders are down. And then we take those two deep breaths, and we're done with that one. Then the last one is T for tall. So, I bring the arms out, perpendicular to the ground, and I have palms up. But then I also sometimes rotate, just to stretch and feel the difference. Rotate my arm so that I am still palms up, but I've turned turned my hand completely. I flexed it around, upside down, and back up. And not everybody can do this. I'm lucky that I work with an amazing occupational therapist and we can often, I can consult with her, sometimes we share patients and she knows them very well, and can say this is not an activity that would be good for that person, and then we modify it.

But these can be done in a seated position in a wheelchair, or it can be done standing as well. So, I spend a lot of time with my clients on this because this is going to be something that I feel good about when they discharge. I can say all right, if we can make this a habit, and they know now, when they come, oh, do we have to do this again? And we check our our head posture. Is it in alignment? No. And I get out that respiratory hierarchy, and I say, all right, you're struggling right now with volume, so

why? My Parkinson's patients, and the Lee Silverman voice technique about increasing volume. It can't happen in a vacuum, we have to build up to that, we have to make sure that these other things are helping that, facilitating that. So, the way I am tying, like I said, tying the element of music to this is that this is the melody of speech prosody, and we really, we talk about, like with dysarthria, we're going for compensated intelligibility. We want as much prosody in somebody's speech as possible. It is so, not natural to hear monotone and limited expression, but I'm not typically gonna start working on prosody at the very top, we'll always incorporate respiration at the very bottom. I have also, part of the training of cognition and metacognition with my patients is, I always tell them, what are we working on? Or I ask them, what are we working on?

And can you tell me why? I don't want them to just go home and say, you know, my speech therapist has me push my chin in. I want them to say, I really need to be careful about my forward head posture. It puts pressure on these muscles, and I fatigue, and that's going to impact how I speak. So, I want them, we go through this every session, we talk about it, I want them talking it back to me. They typically do not need this handout every time, once they're trained in it. Of course depends on how many sessions I get with them, but typically, by doing this every session and I give them a customized home exercise program, this is part of it, so they should be doing it every day at home as well in outpatient therapy, then it becomes just part of their routine.

And it makes me feel so good then when they do discharge. So, this handout, this one in particular, I like it for a couple of reasons. It's only four exercises and a head posture reminder, and that's easily manageable by most of my people. I find that there are lots of exercises you can give them to work on the extrinsic laryngeal muscles. But, you know what, when I was giving a different exercise every day, by about the fourth hand out, these clients, I could just tell, their eyes were glazing over, they weren't being compliant. And, I will say that, if I have a client who is not getting it, they're not being

compliant for whatever reason, my first reaction is not to say, well they're not getting it. What's wrong with them? My first response is to say, I wonder what I can do, what I can say, to make it easier for them to understand, to make it easier for them to be compliant so that they're more successful. So, I always start with me and my delivery of that raw, unformed clay in the metaphor I told you about. What am I doing that is keeping them from being able to produce something out of this cognitive material? So, all that to say this is four exercises, it's on one page, and I will tell you that sometimes I'll say okay, now we're gonna add head turns.

And so we'll move the head to the right, or we'll move the head to the left to get those extrinsic laryngeal muscles more pliable. But, I don't write that down because I think they lose it, it gets to be too much. So, all that to say, music is a facilitator and I use music with this too, when I say we're gonna breathe in deeply, two breaths, I often will have music playing, and it is music that is salient to the client. I'm not going to play, probably Barbra Streisand for a client who's 18 years old, unless she likes Barbra Streisand. I'm gonna find music that is relevant to the person, and relevant to the task.

And this helps them also relax. And it helps them participate in these exercises to expand their thoracic cavity, to stretch the lungs, so they can have greater inhalation, and then more driving force for everything above it, which is including the melody of speech. So, if somebody asks me, so you're doing exercises to open the chest and adjust posture, why would a speech-language pathologist do this? You say it's part of respiratory muscle training. And they say, well, why are you doing that? You say to facilitate respiration. Why? Because respiration is the driving force for all speech, including our melody of speech. So, it's so important that we know the how and the why of what we're doing with our clients. Then you are within your scope of practice. You're not doing anything unethical, and you can feel confident that what you're doing is making a difference. So the big takeaway of all this is that music is, it activates, it co-activates so many systems, and respiration is at the bottom of all of that. All right,

thank you very much for joining me today. I appreciate your time. You can contact me, my email address is there if you have any questions later. Thank you.

- [Amy] All right, thank you so much. And if you could just take, we have like 3 minutes, if you could just take a couple moments to just summarize what you have with these next few slides, that would be great.

- [Becky] Sure, sure. So, in the next few slides before we actually wrap up, I wanted you to look at these references for future-- These are your treasures that I've offered for you. And, it's not progressing. The slide is not progressing, let's try-- Well, it's not progressing, but you should see in your slides that I have magazines, journals that you can subscribe to on music and medicine. And yes, they cost money, but you get free access like any other journal, you get free access to the articles that are in there. And there are, let's see, one of the-- Okay, so we start out with vintage photos of Einstein, quotes by and about Einstein. There are also specialized trainings like the neurologic music therapy training I told you about. These are great places to start if you want deeper study okay. Then we also have some more on the neuroscientists, I really wanna encourage you, of the four neuroscientists, I wanna encourage you to look at these links and try to find them on TED talk. Of the four, I wanna say Dr. Aniruddh Patel is probably the most conversational. He has a real knack for taking complicated neuroscience concepts and delivering them in layman's terms. And so, and he's just a really engaging speaker. So I have some links for you there. So the web, the organization I was telling you about was International Association for Music and Medicine. So, it includes research into the benefits of music and its specialized application in healthcare. There is a link to Dr. Michael Thaut's Academy of Neurologic Music Therapy. Don't be put off by the fact that really everything is geared for music therapists on his website. I have written to him and I specifically asked is this applicable, do you recommend this for speech-language pathology? I think he'd be thrilled to have more speech-language pathologists taking his training. I do mention

interactive metronome, which some people think is controversial. I'm gonna let you make your own decision on that. But it does tie in with Dr. Thaut's theory that rhythm is the harness for all learning. So there's a link for you to to learn about that. You can actually get trained in how to use interactive metronome. And then, the very end are my references, if you love to read like I do, just take some time, I know this is a weird time we're living in, and maybe you have more time because of it. So, just browse and enjoy looking through some of these articles. They are current, some are a little bit older, but for the most part most of these are within the last five years. And I think this will just really inspire you and hopefully you will be able to go on and learn even more. I will say that these articles, and what I presented here today, this is all information that we've only just discovered, like in the last 25 years. That's the age some of you are watching this. So I think we're at the infancy of the ways we can use music, not just as music therapy, but in speech-language pathology, and other disciplines as well.

- [Amy] All right, wonderful, thank you so much, Becky. We really enjoy learning something that's a little outside of our normal scope of practice and see, like you said, how we can incorporate new things, new ideas into the field. So thank you for sharing your expertise. And with that, we can go ahead and rap it up there. Again, thank you so much for joining us and, we can go ahead and end there.

- [Becky] Thank you.