Myofascial Interventions Part IV: Therapeutic Taping

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- [Calista] Our course title today, is myofascial interventions part four therapeutic taping. And it is my pleasure to welcome back once again Dr. Scott Cheatham, physicaltherapy.com. Scott is an Associate Professor in the division of Kinesiology at California State University, and Dominguez Hills in Carson, California. He is the owner of Sports Medicine Alliance, and he received his Doctor of PT degree and his Doctor of Philosophy degree. He is also a Board Certified Orthopedic Physical Therapist and a Certified Athletic Trainer. He held several fitness certifications, and is a certified ergonomic specialist as well. Dr. Cheatham is a national presenter for various organizations and has authored over a hundred peer reviewed publications, textbook chapters, and several home study courses, on the topics of orthopedics, health and fitness and sports medicine. He is the co-editor and contributing author of the textbook titled "Orthopedic Management of the Hip and Pelvis." His professional responsibilities including being an associate editor for the NSCA Strength and Conditioning Journal, the Journal of Canadian Chiropractic Association, and a manuscript reviewer for several other peer reviewed journals. Dr. Cheatham is an education and research consultant for various health and fitness organization. So thank you so much for being with us today, once again. And at this time I'm gonna turn the microphone over to you Scott.

- [Scott] Okay, great. Thank you so much. Hi, everybody. Welcome and thank you for attending this presentation. I first would like to thank the amazing team at physicaltherapy.com. Calista especially and Kathleen for providing us with this amazing platform to share information. So as we can see here with the title, this is the fourth presentation in a series discussing the popular myofascial interventions. And so today we're gonna be discussing therapeutic taping. As far as disclosures and stuff. Currently, I just wanna disclose I don't have any financial disclosures, that would influence my discussion. I am getting a stipend from physicaltherapy.com for this, but everything else there is no conflict of interest. And all of our content that we're using is

properly cited and that we have permissions for them. Now a little bit about myself as we heard, currently I do have a orthopedic clinical practice, but I'm also a mild fascial researcher. So I think today's topic is especially interesting because we're gonna dive into the world of kinesiology taping. So I think this is very fitting to be our fourth installment of this series, because as we all know in short KT. KT tape is so popular. And so we're gonna dig a little bit deeper into it, and look at the evidence and also the clinical applications. So as far as on that note, there's really four different learning outcomes I would like to obtain as we have this two hour discussion. So the first outcome would be, that I want participants to be able to discuss the two current scientific theories, behind therapeutic taping. Outcome number two as discussed at least two best practice patterns for kinesiology taping, and also athletic taping. And then also to identify at least two common indications, precautions and contraindications for each intervention.

And then the last outcome would be identify at least two important aspects, of current evidence behind each intervention. And again, a second disclaimer slide just to kind of summarize that. To give everyone kind of a blueprint of what we're gonna be doing today is, I've broken up the topic of therapeutic taping, into really two different subjects. We're gonna dig deep into kinesiology tape. And then we're gonna spend a little bit of time at the end on a typical athletic taping. Using the cotton like Johnson and Johnson tape. And so I've designed this whole discussion, into basically nine different modules, that we're gonna be using a unique question and answer format. So I think it's gonna a little bit interesting because we're gonna be covering a lot of those clinical questions that we were always constantly asking, about the world of therapeutic taping. And so I think it's important to kind of set the tone because this discussion's really looking at the clinical application, the research, the science, and we're not necessarily gonna go over techniques and stuff because as you know the many manufacturers of KT tape, they have a lot of their own continuing education and their own way of kinda quote unquote how to tape people. So this is more of a analysis

and appraisal of the evidence, and also a survey of what professionals are doing. So I wanna kind of set that tone because as we go through I think it's gonna be interesting, when we look at things like the evidence behind, the angle of tape. The tension. Also what we're using it for. So when we go through these question and answer formats, there's gonna be some questions we're actually gonna poll, the participants and see what you guys think. So I think it's gonna be an interesting presentation. So we're gonna go through over the two hours. I will do my customer one hour stretch break, one minute little stretch break, and then I will also be queuing everybody throughout the presentation, for the quiz questions.

So on that note, let's get going. So module one. I always love to start off these topics with the scientific review. When we look at the nomenclature of kinesiology tape, we can see that it has been very popularized ever since the 70s. So we have hundreds of studies out, when we look at the huge body of evidence, kinesiology tape is tooken on different names. And so if we're looking at the slide we can see on the left, a lot of people just use a simple kind of mnemonic or acronym KT. We know it's kinesiology tape, Kinesio tape, k tape, elastic therapeutic tape, or a lot of the manufacturers use their name. And so I think it's important to understand that the terms of the tape, has morphed over the last 15 years of research.

And also we've seen it with the different manufacturers. When we look at the original design of kinesiology tape, it's always good to go back to what it actually is and this is gonna be my first point for the group, is that when we look at the slide here we know that, it's made of like thin elastic cotton-based tape. We understand that, we know that it's woven with an elastic within it, and that provides the stretch. And we know that the length of a stretch of a typical piece let's say if it's a precut strip, of let's say maybe two to four inches, it can stretch up to 140%. We understand that these manufacturers they'll put an adhesive on it. And so we know that that's heat activated. But a key point that I want everyone to understand is, is that the tape is already on a pre-stretch. And I

think we understand that if we take people. But we always have that 10 to 15%. So when you talk to other clinicians, and they say, Oh I only do a 10 to 15% stretch that means that they just lay it on the skin. Versus pulling that 25, 50, 75, and we'll talk about that later. So I think it's interesting when we look at the design of tape. And that's my big kind of thought that I want everybody who's with me today, to really think about is that, every manufacturer manufactures the tape differently. And so I think that that's important to understand because for me as a clinician, I'm not really worried about a specific brand or whatever but I need to appreciate, that each tape is different. So I myself I don't have any proprietary interest in any of the tape brands. I actually get tape from Amazon. I get an off brand that I like. But I've tried different tapes and I found one that I like, and it seems to give me the clinical outcomes that I'm looking for. And I'll talk more about that on a personal level.

So I'm not really married to any manufacturer 'cause they're all different. But I want everyone here to realize that they all make the tape differently. That's gonna feed into our research. That's gonna really have an influence on the body of evidence, and have a big effect on why there's a diversity, among clinicians and researchers on the outcomes. And so to me that's one important point that I wanna decipher, in this discussion. And as we move forward we have our common indications. We know that KT is used for pretty much everything. Sports, neuro-sensory effect, edema control, post-exercise recovery, et cetera. So we'll talk more about beliefs and actually why we do that here in a short time. So now though as we transition, let's look at the history of KT tape. As far as the literature and the nomenclature and stuff, really KT was created by a Asian chiropractor Kenzo Kase. And he's trained here in the United States, he's licensed and stuff, but he came up with the original kind of version. The first generation of this KT tape, back in the 1970s. Basically between the 1970s and 1990s, he came out with a couple of textbooks and writings, discussing his method of techniques. That has kind of stuck around, all the way til present day. So I think that that's interesting to understand because when we start looking at the original research, we wanna compare

what the research is saying with the original way it's taught. And a lot of the manufacturers still teach a lot of the traditional methods, as far as if you go with the grain of the muscle or the pennation of the fibers that's facilitation, if you cross a muscle it's inhibitory, there's a lot of things that was discussed in the original texts, that are still taught today, yet there is a disconnect between what we're learning in like continuing education courses, and what the research is telling us. So I think that that's another important point, where we're looking at number one is, how the tape is manufactured. And also, what are the clinical methods.

And so those are two big things if you guys are writing notes today, to really kind of focus on. So again, back in the 1970s is where we kinda got the recipe for taping individuals. Then as we fast forward till 2008, that's when especially in the Beijing Olympics, a lot of the athletes were wearing KT tape of different colors and stuff, and then it started to become very popular, and then obviously as we fast forward to 2012, we can see especially with the taping, copying, all those interventions became super popular. And then as we fast forward to today, we know that kinesiology tape or KT tape is used worldwide.

So it's kind of interesting as we track the history, over the last 30 years. And we can see though, we have a huge body of research, that is very inconclusive. And so we're gonna dive deep and really try to decipher what is going on and stuff. Personally as a clinician I do get some results with the tape, but when I compare my clinical outcomes to the research, there's obviously a disconnect. So I think that that's important to kind of decipher and stuff. And so now as we move forward though, we come to our first clinical question. What are the current theories behind kinesiology tape? So if you take a second to think what's the latest and greatest, we have a couple of theories. We have two that are appearing in the research when you appraise, the hundreds of studies. One believes like on the left, a lot of researchers believe that there's a local mechanical effect. And then on the right, a lot of clinicians and experts believe that there's a

neurophysiological effect. So let's talk about the mechanical effect first. So if KT is applied to the skin, we know that the elasticity causes like a mechanical defamation. So obviously when you lay down the tape, you know you take the one end of the tape, you press it onto the skin and you rub it to create an anchor, and then you pull whatever tension you want, and then you anchor the other end. So the two ends theoretically are gonna kind of come together, that's causing the skin and myofascia theoretically, to lift up. It kind of creates some space. Or a lot of researchers call it a decompression. But remember though too at the ends of the tape that were pushed down, that's also gonna cause a compression, and a tangential sharing of the fascia. But a lot of people believe and researchers that, it opens up a little bit of space, so you're gonna get dilation of the vessels around the area. You might increase that interstitial space, and decrease some tissue strain.

So that that local mechanical effect, will show up clinically, as a greater range of motion, decreased myofascia stiffness, increased movement efficiency, increased local proprioception because you're making local changes. Researchers though, there's a pretty much a consensus to say okay, we know locally the skin and the superficial fascia will be lifted up, but what about the mechanoreceptors in the area. That kind of led to the neurophysiological theory, of saying we get defamation of the tissues so you get that local mechanical effect. But also though too, all the efferent receptors in the area, get stimulated because you're pulling on the skin. It's really that simple and the different layers of fascia. So that action locally is gonna send efferent signals to the brain, the brain is gonna process it, and then it's going to induce this neurophysiological response. And so that's gonna result in a lot of the same clinical outcomes that we see. Decreased pain, greater joint, movement efficiency, range of motion, decreased myofascia stiffness, it might have a little bit more of a regional effect, so we see though that these two different theories, go hand in hand, with basically a lot of our myofascial interventions. And as you follow me through the series of the four we've done, the research on most of these interventions are pretty much

similar saying well, you get a local mechanical effect and a more kind of regional/global neurophysiological effect. So I wanna make sure we spend a little bit of time on this topic, before we get into more questions. And so that's kind of the theory and here's just a summary slide. Is that a lot of clinicians believe... I believe personally, probably more on the right. The neurophysiological effect. The one thing just talking from clinician to clinician not even a researcher here is that, when I tape somebody, I wanna tape with purpose. And I know it's gonna be one piece of a comprehensive, rehabilitation strategy. And I think that that's important to go by. Because I can't depend on KT tape for everything but I may use it, to open up some type of neural motor window, some type of proprioceptive input, especially with these postural dysfunctions and stuff.

I might use the tape as a cue, as a biofeedback cue, so I think we have to have a purpose for it, but we need to make sure that we try to be evidence based, but then again clinically, we may use it for other methods. And so I think it's important to understand what are the current theories out there, but also remember too, we've gotta do what's best for our patients too. So we have to kind of try to blend both of them into our clinical practices.

And so when we look at the evidence and stuff, believe it or not, we have some studies that support, this mechanical effect. So in 2015, Pamuk and Yucesoy looked at an MRI. And also in 2018, Cimino did an ultrasound study. Both these studies use some type of imaging, and they found that when the KT was applied, that there was a visible defamation of the skin and the tissue, but also it moved some of the fascia at distal regions. So basically we're starting to get at least some preliminary evidence that when the KT tape is applied, it definitely can possibly move or make some mechanical changes, locally and at a distant region. So I think that that's interesting. And the 2018 study was in the Journal Biomechanics and I thought it was done pretty well. So to me that that's pretty cool and that just gives support on how amazing the myofascial

system is. And to realize if you look at the image on the right, you could see that we're kind of surrounded by this, I call it a spider web. And so if you pull it in one area, you're obviously gonna affect areas down the kinetic chain. And so I think that at least we have some preliminary evidence to support this theory. So just keep that in mind is that we're finally getting somewhere with these myofascial interventions, and also KT tape. That we're finally starting to see some evidence. So I thought that was pretty cool as far as that. So as far as module one bottom line is, we really are sticking with the same two theories that we've had throughout this whole series of talks, is that mechanically, locally, more regionally or globally, a neurophysiological effect. And so based on the evidence that we're seeing right now, and again it's very preliminary, we could be getting a local and distal tissue defamation.

And then we also know too, that we might be getting more stimulation of those efferent pathways up to the central nervous system. So I think it's interesting to start with that because now we're gonna get more into the clinical application of it, but I want everyone to remember the science behind it and support why we're doing it. So now as we get into the next few modules, I want to premise it with a little bit of information. So as I mentioned just a couple of minutes ago, there's a huge body of KT evidence, hundreds of studies. As a myofascial researcher, I've done a lot of research on all the other interventions, but I decided to tackle KT more recently because of the lack of evidence, or the poor supporting evidence overall. So what we did was instead of just doing another study, using our own methods and our own tape, we actually conducted in my opinion and what I've known, the first study that's looking at a survey. So this is the first survey study of healthcare professionals in the United States. We recently finished this the end of 2019, is actually in review in the International Journal of Sports Physical Therapy. It should be on PodMed hopefully by the end of the year. We're hoping. So what we did was instead of embarking on our own research, I wanted to survey a big cross-sectional group of professionals, to figure out what they're doing with KT tape clinically. And so I got a group of experts and I have two really good

researchers, Dr. Baker and Dr. Abdennour they helped us come up with 30 questions clinically, to really try to dig deep into what we're doing with kinesiology tape. And so we surveyed a ton of people as you guys can see we did all the physical therapy components, the APTA, orthopedic section, the sports section. We went to the NATA and we also surveyed private Facebook groups. We had a total of 51,000 emails we sent out or notifications. And we got a thousand people back. So as you know survey studies are tough and I know that, but in my opinion for this type of a survey, having over 1000 people respond, to me that's a pretty decent sample size. So it gives us at least some idea of what's going on. So what we're gonna do is, as we move into these clinical questions, we're gonna do a Q and A format.

So we're gonna pose a clinical question, on a few of them we're gonna poll you guys and see... Ladies and gentlemen we're gonna poll you all and get your idea. But then we're gonna compare, what survey respondents said in the survey, and then we're gonna compare it to the research. So I think it's gonna be kind of unique because we're gonna be covering 30 of the most asked questions that we've all posed, with kinesiology tape, and also with athletic taping. The sports athletic taping. So let's move forward into module two.

And this is kind of looking at beliefs. So this was our first section in the survey, where we wanted to dig deeper and say okay, out of the 1000 plus people we surveyed, what do they believe about KT tape? And that's important. So the first clinical question and we're gonna pose this to everybody here. So if we can bring the survey up. As participants here, do you believe that KT modulates or changes pain? Please provide your thoughts. And we're gonna do a little survey kind of a little poll. All right. We're gonna give everyone just another minute or so to provide their thoughts. And again this is an anonymous survey, so you're welcome to please put your thoughts in. We'll just give it another couple seconds because we wanna get through the information within the time allotted. If we're looking at the survey, the majority. So we had 45 respondents

for the survey for this question. We have an overwhelming majority believing that it does modulate pain. So let's actually go back to the slide deck now, and let's see what the respondents of the survey did. So in the survey we basically asked three questions. And in the survey that we sent out to the 1000 plus people. Number one is what are the common reasons to use KT on clients? What therapeutic effects and physiological mechanisms occur? So those are basically three questions. The survey respondents could pick as many different categories as they want or topics. So these are multiple choice questions. So based on those three questions, 60 to 70%, so basically six to 700 of the respondents believe that KT, modulates pain or changes it. So it's interesting where we have at least the 45 respondents in this group, it kind of coincides with the survey respondents. So we're getting the consensus among clinicians, on what maybe we see at the clinical level, and all that. So let's look at the research. What does the research say now about KT tape and pain?

When we did the lit review, and again I wanna premises slide. If you see a steady with an asterisk, that means that they reported positive outcomes. So this makes it easier because again, there's hundreds of studies. So basically with all the research that I'm gonna talk about today, I basically appraised the last five maybe 10 years of research because there's so much. So when we look at the slide here we can see, from 2016 to 2019, we have four studies that support, the positive effects. So basically four research groups are saying okay, KT does change pain. But then we also get a conflict of research, from 2015 and 2019 from Lim and his group and Sheng, they found inconclusive findings. So again, we get some mixed evidence when we talk about the most current research. Now what about delayed onset of muscle soreness? That's another way a lot of clinicians use KT. It's kind of interesting when we talk about DOMS. We know that DOMS settles in, after strenuous exercise between that 24 to 72 hour window. We understand that. We're seeing that there's actually four studies that support the use of KT on decreasing the effects of DOMS. So we have stronger evidence for delayed onset muscle soreness, versus possibly looking at just general

pain modulation. So its pretty interesting to see, that we have stronger evidence for that. So when we talk about the beliefs and stuff, I personally believe that KT does have some type of blocking effect of the local nociceptors, and the free nerve endings. Is it working with the pain neuromatrix? Is it using the gate theory of pain? Is it working on those descending pathways that help block pain? I don't know. But for me clinically, especially with low back pain and all that, I think some tape is kind of chicken soup for the soul for them. Does that make sense? I really think that there's some effects on that. So personally as a clinician, I do use it to modulate pain. And so I think the evidence is decent in that area. So it might be something to consider in your practice. Next clinical question if we could bring up the survey.

Among the group here, does KT create a neurosensory effect and enhance muscle re-education? So here just stay on task we'll do about 30 seconds or so. So if you guys can click on what you think. And as I'm chatting as we're waiting for the poll to get the answers, think about it as neurosensory like you're trying to do some type of neuro re-education, you're trying to activate a muscle. That's what people describe. A lot of manufacturers who teach it, believe that it does kinda have some type of neurosensory effect. All right, let's do about five 10 more seconds, if you want to provide some opinions.

So when we look at the poll here among the participants, we can see that we have the majority believing that they actually see it, or they believe that KT does create some type of physiological neurosensory effect. So now let's go back to the research. And if we could switch over to the slide deck now we can see, we also asked the same three questions. Like what are the reasons? Let's look at the diagram on the right and let's look at the blue. 60 to 70% of participants also believe besides pain, they believe that it has a neurosensory effect. And also they believe that it has some efficacy for neuromuscular reeducation. So I thought that that was an interesting finding for that. When we look at the research though, we go back and believe it or not everybody we

have some pretty good evidence, as far as more recent research. Hospin Bischoff actually did some pretty good studies looking at it, they found positive effects. But then again when we're talking about the body of KT evidence, we also have research from Torres and Hadamus. Their groups found no positive effects. So again we're still getting this mixed evidence in the literature. And I think that that's so important to consider, because these are some of the reasons why we actually do it. So just something to consider. And so our next clinical question. Does KT increase circulation? Let's get the poll out, and we have only two more poll questions but I'm interested to believe what everyone thinks, or interested to hear or to see what everyone thinks. So if you got a second please give your opinion. And again this is an anonymous poll, we're just having a little fun here trying to get some ideas on what you think about KT tape. And as everyone's kind of providing an answer I'm gonna give a little narrative here, remember too, when we talk about beliefs, this drives our treatments.

So If you have a patient that you feel that has pain, you're gonna use KT as a tool in your toolbox. I think that this is an interesting portion of our lecture today because it really drives why we're using KT, and when and where we include it in that treatment strategy. So let's conclude the poll. So again we can see, that the majority of respondents, believe that it does increase circulation. So let's look at the evidence. When we look at the survey evidence, we can see that if we look at the blue in the diagram, we can see that out of the 1000 people we surveyed, 65 to 75% will just kind of round it or 74%, believe that the KT tape does create that tissue decompression that we talk about. And I thought that that was interesting because I've been to some of the tape manufacturers and their education, and some of them talk about it, some of them don't. But as you know, you can put KT tape with the little thin strips on some people. And especially if there's like an acute ankle sprain, I love to use KT tape and then after a couple of days you can see that it has facilitated, some type of vascular changes, and you can see the ecchymosis go away. We've seen that a lot on social media or clinically. So it's an interesting kind of thought on what people believe. And so when

we go to the body of research and we look, we can see basically the last few years have put together some pretty good studies, that support the local circulation. And a lot of these studies even from 2018, Yang and Slomka, they used a lot of imaging. And even the newer studies like by Banerjee he's a big myofascia researcher and Liu, they use imaging to look at the vascular changes and stuff. And a lot of these studies really showed with objective imaging that the KT tape, does change some type of local circulation.

And again I think in some instances I use it clinically especially, if I'm practicing more as an athletic trainer, and I have an acute injury, or an ankle sprain, I think it has some effect. I think it's more of a neurophysiological personally, but I know definitely that there is some type of local circulatory changes and stuff. And again at this point I can't explain it, but at least we're having some evidence to say, okay we're making some changes. Next clinical question. And let's kind of get out our poll. We're almost done with our polling questions.

Everybody here in the group. Does Katie improve myofascial mobility? And that's a big one too because I know in athletics or more of our sporty kind of weekend warriors, they're using KT all the time. So we'll take a few more seconds. Why don't you give your anonymous thoughts in the poll. All right. Thank you everybody so much for participating and I appreciate that. So again when we're looking at the group that's with us today, we can see that among the respondents, we're still getting a majority believing that KT provides malfunctioned mobility. And then we have a smaller group who may kind of question things. And so I think that that's a great way of showing just among us all educated professionals, we have some different opinions. And to me, that's a flaw in the KT tape research. And we'll talk more about that as we go. So thank you so much. So let's go back to the slide deck, and let's kind of look at what respondents believe. When it comes to myofascial mobility, among those three questions that I sent out to respondents, we have a little bit more of a minority don't

we, we have about 25 to 29%. So we could say close to 30% rounding it, of individuals that support the kind of quote unquote myofascia mobility stuff. So interesting to see how when we talk about pain, the neurophysiological response, circulation, we have a stronger consensus among the group here, as well as the 1000 professionals that I surveyed. So it's kinda cool that we actually see that, and believe it or not that's correlating with some of the research that we just saw. You're always gonna get mixed research. It's never gonna be perfect, but I think that that's an interesting practice trend. Excuse me. So then when we look at the research, we can see again with the asterisk positive outcomes, we have some ultrasound and MRI studies. Those are the ones that we saw before, showed that the myofascia does move locally and distally. So that is some evidence. Right now, I'm gonna call it weak evidence. We only have two studies. But now as me as a clinician, I'm gonna be using the KT tape more for neurophysiological.

Honestly you guys that's what I do. And again I use generic tape. There's a brand that I found that I like I use it more for the neurophysiological, and I'm not thinking, okay if I tape the quad, all of a sudden their overhead squat, or their FMS scores are gonna be improved by six points. No, I'm gonna use it to open up some type of movement efficiency window. Does that make sense? So that's kind of how I see it right now, personally as a clinician not so much as the researcher. So that's kind of some thoughts. And then our last question, sorry I did forget one more. Does KT create a placebo effect? Let's poll everybody on this one. I think we have one last one. Let's go ahead. And again my apologies I think I forgot we had one last one on that. We'll give everyone a few more seconds. Okay, good. This is an interesting topic and I wanna to spend just a second on this. Let's go to the slide deck. So as we can see we do have the majority looking at the placebo. And I think it's interesting because when we surveyed respondents, you know everybody, I was actually surprised because with a lot of the questions we had up to 74% of people, use it for placebo effect. But then also during the online survey I had a comment box that I included, and believe it or not,

we had hundreds of people just say, I use it as a placebo, because it basically made the patient feel better. And I thought that that was interesting because here we are doing a ton of research on all these other effects on the body, we have all these manufacturers producing tape, they're promoting it, it's done everywhere. We're paying 11 to 13 bucks per roll. And then a huge amount of participants are using it just for placebo. I thought that that was interesting because if we're using it for that, to me as a researcher, we're not doing our job to produce the effects, that other people think or we think that is clinically. So I think that that's an important point because we're very surprised as a research group we you go wow, 74% in some categories. Believe it's just for placebo, and they're just doing it for the patient.

We know that the placebo effect is very important with a lot of stuff we do, we know that hands on manual treatment and all that stuff, but I was surprised to see that at a KT tape because if you look at social media, if you look at all the manufacturers, they're driving the other effects. Pain modulation, neurosensory feedback, increased circulation, myofascia mobility. But the question for all of us is, is it just a placebo effect? Or are we getting all these other effects? And that's where the research is lacking to answer those questions.

So when we look at the placebo research, it's really interesting because we have quite a few studies, from 2016, to 2019 that show that the placebo effect works. So just kind of simply talking. Ever since 2016, the Freitas's group all the way up to Mark et al, they compared Kinesio tape with the sham, with fake tape that doesn't stretch, with other athletic tape, with the rigid strapping tape, they've done all of it. And they actually have done some very good placebo studies. And these studies show that there is a placebo effect. I know that that sounds kind of obvious to probably a lot of people here who are listening today, but it's an important point because that drives our treatment. That drives our treatment. If you're gonna be using the placebo effect to get somebody to walk better, and to open up that neuro motor window and get rid of that limp after

surgery or something, then that's something you could use as more of a facilitation, or to build confidence. Great, that's a tool in your toolbox. But as evidence based practitioners, we have to make sure that we're integrating evidence with practice and we understand that. So this is something to me that was very surprising. And when my research lab opens up again, 'cause it was closed during the COVID, I'm gonna be studying the placebo effect. Because I think it's interesting because I wanna see how it's affecting our patients. So that's something for me as a clinician and as a researcher, this is one of my burning questions for this topic. So hopefully everyone enjoyed that. That was more of a perception. So module two was really like what people believe. So most of the survey respondents match the research. So I thought that that was interesting.

So based on the research, we know that KT may produce the pain modulation, local circulation and placebo effects. And then we obviously have weaker evidence for this neurosensory effect. As far as muscle activation and stuff. So I thought that that was a good way to start with that because that typically drives our treatment. So now let's move forward and let's talk more about the clinical application. How do we use the tape in clinical practice. So this will go a little bit quicker. We're gonna pose clinical questions, to you all in the lecture today, but we're not going to poll anybody else. Just for sake of time. So first thing we ask people. So now we're going to application, and we're just gonna pose the two clinical questions we asked respondents, is really simple. Which commercial brand do you commonly use? So that's our first one as far as KT application. And which colors do you use most often with the clients? And I think that that's important because when we talk about placebo and perception, different brands promote different things. But also the colors, are what clients like. So we wanna provide a service. So basically, as you can see on the left, when we surveyed the 1000 plus people, the four big manufacturers came up. KT tape, RockTape, Kinesio tape brand, and then believe it or not TheraBand was becoming more popular. Something to consider is the top four manufacturers. They all make their tape differently. So please

keep that in mind as we talk throughout the lecture. Popular colors when we look on the right, black seems to be the most popular among the respondents of the survey. Beige blue and pink. So we have our standard colors, we have our standard brands, but I think it's interesting to poll people, survey people and say okay, what's your favorite? Because this is what's driving the market. Those colors and those brands. Next set of clinical questions we asked survey respondents is pretty simple. Which type of standard KT do you use most often on your clients? When we talk about standard KT, we're talking about the two inch roll. Very simple, not the specialty t cuts, or whatever that these manufacturers sell. And so question number three is really focused on the standard roll that you get.

Question number four is focusing on the specialties that they're coming out with. So on the left as we look at results, 67% out of the 1000 plus respondents, this typically do an uncut role, and they cut it themselves. Was less popular is a standard pre-cut strips, and the super wide roll. And I thought that, that was interesting. On the right when we talk about specialty pre-cut, really a lot of the survey respondents don't spend the extra money to get these pre-cut strips. 83% were like no, we don't do it. 9% like the fan, the pre-cut fan.

And then obviously a lot of the manufacturers have pre- cut specifically for the lower and the upper extremity. And so we can see that a lot of professionals out there, at least the ones we surveyed, really just buy probably to contain costs. Just a standard roll, and cut it themselves versus trying to get these specialty or specialty pre-cut tapes. Kind of interesting. So I think that's a good trend. Another trend, we looked at some other trends is for question five and six of the survey, which is interesting is, what about the new commercially infused KT tape? That's question five. I thought that that was interesting because those are becoming very popular. Question number six is, what type of topical analgesics do they use? So let's put this in context. Most of the states now have approved CBD, hemp and all that stuff or other stuff. So now these

manufacturers are infusing different tapes, with CBD, menthol, tourmaline, all these other type of ingredients. So those are becoming popular, at least on the market. And then a lot of clinicians may combine some type of topical analgesic over the tape. So when we surveyed everybody about the infused tape on the left, we saw an overwhelming majority, do not use the newer infused tapes yet. And I thought that that was interesting because at least here in California where I live, CBD has become pretty popular. And so there's a lot of local tape manufacturers, who are starting to produce these infused tapes. There's a minority of survey respondents who use menthol, tourmaline and CBD, but I thought that was interesting. And then on the right when we look, the majority over 650 respondents, do not use any topical analgesics. And then a minority do use topicals like Biofreeze, very popular, RockSauce, Fire Rocksauce Ice, and then also Flexall. So there was a couple other manufacturers that were maybe one or 2% of the sample size, or the sample respondents, but these are the majority that we looked at.

So I think it's interesting when we talk about the section on beliefs. How we believe it, and then also how we're applying the clinical application. I think that that's kind of interesting when we look at that. So now when we kind of summarize this section, KT application literature review. There was actually one interesting study that came out of 2018, by Cavaleri. There group is also pretty good with the research. They examine the perceptual influences of KT tape color. And I thought that was interesting because they took a pretty good sample size of athletes and younger individuals, and put them under five conditions. No tape, KT beige sham, beige KT with 50% tension, red KT with 50% tension, and blue KT with 50% tension. And so what was interesting is, they found in 2018, regardless of the color or the stretch tension, it did not alter any other athletic performance, lower extremity strength or neuromuscular function. So again Cavaleri they looked at the different types of tape, the different types of application, on sports performance basically in this group. And so they found no differences. So right there is showing that KT had no effect, regardless of color and the way it's applied. It's an

interesting study just to kind of provoke some thought among the group here, on what's the latest. So bottom line when it comes to this clinical application in module three, is that we understand that the top four tape brands are popular. Most respondents use the standard roles and not much specialty tape. Infused tape is not popular right now. Or topicals. And we understand that the colors of black and beige are the most popular. And then at least one research study is supporting that color, doesn't really have an effect on the tape. It's really just probably preference of the clinic, the clinician, or the patient. As we move to module four, we kinda took the next step. And in the survey we looked at treatment variables. And I think for the group, this is gonna be an important topic.

Because this really boils down to how we apply the tape. Now if everyone remembers, remember I talked about in the beginning, we have two different themes that may influence KT as a whole. The body of research. Number one is, how the tape is manufactured. Number two is, how do we apply it. So let's take a deeper look into the application or treatment variables. The first clinical question we ask is, what is the ideal KT tension length? And this is something that's variable because if you look back at the original recommendations, back from Dr. Casos textbook in the 70s, we were taught different things weren't we?

We were taught, in all these con-ed classes over these years, that you anchor the end, and then you pull the middle of the tape, 25 to 75%, to get some effect. And so if we pulled the tape 25 to 75%, it might be good for a musculoskeletal condition. It may enhance sports performance. If you pulled 25 to 50%, it's good for fascia circulation, stimulates the muscle activity or muscle inhibition. And then if you're applying a general treatment, you just lay the tape on because it's already pre stretched, up to 15%. So this is what we've been taught. And this is currently what a lot of the manufacturers teach, is that you can pull it and you're not, but we're seeing a shift in education where a lot of manufacturers are saying well, you don't need to pull the tape

very much. 'Cause it can irritate the skin, etcetera, etcetera. I thought that that was interesting. So basically when we surveyed our respondents, we actually asked them two questions in this category. So when applying KT tape what's the most common tension length? So we call it tension length percentage. And number two is, what therapeutic effects do you believe occur, with your tension? And so when we look at the answers down below, we can see that most respondents as you can see, pull the tape at 50%. I know this is a smaller slide but if you look below, 47% or 510 respondents of the survey pulled the tape at 50%. But if you look at the range, we can see that 25 to 75%, is the typical range that respondents are pulling the tape. And that's probably consistent what we do as clinicians. 'Cause sometimes I'll pull the tape in between there. But then again though it's an approximation because I don't know exactly that I'm pulling at 50%.

I don't have a strain gauge hooked up to the tape. So this is just an approximation. I thought that that was interesting because when we look at the answer below Q2, we can see that the people based on their choice of 25, 50, 75%, they are consistent, with the group's beliefs here, that it enhances proprioception kinesthetic sense, it helps modulator pain, it increases local circulation, and there's also a placebo effect. So the interesting thing from this is, clinicians out of the thousand or so we surveyed, they pull the tape at 50% regardless. And then they believe that it provides all these kind of sensory and neuromuscular effects. That's interesting. But if we go back to those traditional guidelines, we're supposed to pull it at an approximate length. So this is where in my opinion the research is very weak, because we don't really know how much we're truly pulling the tape. And in class, if you take Cabo's con ed, is a very quick. You anchor you pull, you anchor you pull, or you just lay it on. There's really no science behind the actual tension that's being applied, to the different tapes that are manufactured. And I thought that that was interesting because we're seeing, a disconnect where the majority is like, okay will I pull it at 50%, and I believe it has all these effects. And again these were multiple choice questions. So people could put all

the effects that they believe that a 50% tension, actually creates. So I thought that that was an interesting thought as we go through. When we look at the tension effect, here's a breakdown of what we're seeing, of the therapeutic effects. And then again, this is just a continuation of this last question. We can see kind of a breakdown of Q2, that a lot of people who pulled at their chosen tension, believe that it has these effects. So it's pretty interesting on how we were taught to pull these different links, but most people kind of choose a link, and then you say yeah, I've seen it do this, this and this in my clinic. So it's kind of interesting. I'm not sure. It's something to think about. When we look at the research, real simple. The majority of studies do not support tension length. We've seen studies from 2017, all the way to 2020, that show a inconclusive, insignificant results from pulling tape at a certain tension. And so I thought that that was interesting because we're seeing a disconnect, between the research and what people are believing clinically.

I like to pull the tape around 25 or 75. excuse me, 25 to 50%. That's what I like to do. It depends on what I'm using it for. And I believe a little bit extra tension, through the middle of the tape, makes a difference, as long as it doesn't irritate the client's skin. And so that's what I do personally. So remember on this slide, I think this is slide 51 on the slide deck. There's no asterisk. So all these studies showed inconclusive results with the different tensions. From everything from 10%, all the way up to 90%. So we have to consider that and stuff. All right. So now let's move forward. So we've kind of deciphered link. Let's talk about direction. But before we do that, let's our one hour midterm stretch break. Everyone stand up. Yup, I'm standing with me. You guys can hear me move, put your arms above your head, let's do a overhead squat. I'm gonna to do 10 of them. Just do a quick squat. There's one. Start moving a little bit. Come on everyone get up and move. Do a little stretch break. Let's clear our brain before we get into more topics. Do another squat. Good. Few more. Stretch it out a little bit. Take a deep breath, get that diaphragm moving, get some oxygen going. Good. We've got a few more seconds. 10 more seconds of a good stretch. Walk in place. Do some

dynamics, whatever you need. Activate, reactivate. Okay, awesome. Good. Let's head on back. We've got a little stretch break. Clear your head a little bit. Here we go. All right, so now let's move forward. So we talked about KT tension. Interesting right? So we know that most people are really taping between 25 and 75% what's always been taught, but there's really no science to say that 50% works better than 25 or even 75%. So we see a disconnect. That's important because that feeds into what we believe. Our beliefs that we covered in the beginning of this discussion. So question though, does the direction of the tape make a difference? Think about this. When we go back to the 1970s, Casos book. That was the original.

So most manufacturers still teach sometimes, that if you tape from the insertion of the muscle to the origin, you're gonna inhibit. If you go from origin to insertion, you are going to facilitate. So what that means is if you're gonna inhibit, you're gonna take the distal insertion, you're gonna apply your anchor, and then you're gonna pull proximally or superiorly whatever you are on the body. You're gonna go against the action of the muscle. If you facilitate, you're gonna tape with it. And then also I've seen manufacturers say that if you cross a muscle with tape, it's gonna be inhibitory. And then I've seen other different spiral patterns and all that. The question is, what do respondents believe?

We didn't really ask that because we believe that the tension covered that. So that's one question we didn't ask, but I'm sure everybody among the group, can also believe too that the tension, may go exactly along with the directions. Hopefully everyone kind of gets that. So what we felt was, we felt that if we just asked about the tension, we'll cover direction because either way you do the tape, it's still gonna pull in the middle. It's still gonna come together because of the elasticity. So we didn't really focus on this as far as survey respondents. So now as we went to the research though, we had one study in 2016, report positive effects with directional taping. From there, we've had 2018 to 2020, everyone from Choi and Lee in 2018, to a more recent study by Limmer,

found no positive effects with directional taping. So again, we're seeing that so far in the research, tape tension, and tape direction, which is kind of very similar application, we're just taping. Doesn't really have a strong mechanical or neurophysiological effects, in the research. And remember a lot of these studies looked at those outcomes that we covered in the beginning. They looked at range of motion. They looked at myofascial mobility. They looked at functional measures. They looked at patient reported outcomes. So again, they're looking at some of the common things that we saw, in the first module that talked about all those clinical outcomes that we see. So again, we're seeing some challenges as far as the tape application. So for this module when we talk about treatment variables, module four, the bottom line is, KT tension, length and direction, may not have any effects versus non tension tape. Remember everybody, I personally liked the pull the tape at a certain tension, and I have some decent clinical outcomes with that. Whatever I believe, is not really supported 100% on the research.

So I know it's within a standard of care, because I'm taping everybody. So just remember that there's a big disconnect, in probably the most important variable. And that's tension, length and direction. So again, when we go back to the research, we are gonna go back to that placebo and neurophysiological effect. Maybe just by laying on the tape, you're gonna stimulate the receptors and CNS pathways. So it might be as simple as that. So some of the manufacturers are actually moving towards that of just saying hey, look, lay down the tape, don't worry so much about pulling. That's old evidence. So it might be as simple as that. I'm not sure, the research is still out there but I like to pull a little bit to get a little bit tension, because I feel that tactically clients can feel it more. So again, just a personal preference on that. But just understand that the research and the survey questions, are kind of mixed when it comes to research and what we're doing in practice. Next module, module five. KT clinical measures, education and referral. And I think that that's important. So when we talk about clinical measures, we wanted to survey the respondents and say okay, how are you measuring

it? How do you educate clients? And how are you referring them to go get tape. What are these patterns, 'cause it feeds into it. So when we talked about.... The first question is what are the common clinical measures? It's interesting because we gave them a pretty large multiple choice question. And respondents can pick all or any of them that they wanted. So when we asked what clinical measures they use, we can see that 80% of the respondents, remember we had almost 1100 respondents to the survey, use patient reported outcomes or pros. What's interesting is 40 to 43%, use girth measurements, joint range of motion, 36% use body movement based testing. So they use more movement of the body.

Some use it for sports specific, and also general muscle performance. And that would be more like manual muscle testing, or some other type of functional measure like a single leg squat, etcetera. So looking at muscle performance. So I thought that that was interesting because these are the clinical measures, that are actually being measured in the research. So we can see that we're at least having some agreement among respondents, and what's being reported in the research and what researchers are measuring.

And so for myself, I use most of these it depends on the patient, it depends on what phase they are in their rehabilitation, and also why I'm using the KT tape. Next question. What are the modes of KT education and patterns of client referral? In this day and age now that we're online right now, I know a lot of professionals including physical therapists, athletic trainers, occupational therapists and stuff. Chiropractors are using a lot of social media, we're using a lot of stuff. So it's a timely topic, to kind of survey the respondents and ask, number one is what are the common types of education, and where do you direct your clients? And I think that that's important. And so when we look at live instruction, that tended to be the best. So 89% of the survey respondents they prefer live, but what's interesting is, is 3% only prefer video, and it was interesting. We had a minority just tell people to put on tape whatever they want,

and then some people provide education material. From a legal practice standpoint, I think it's important for everyone to provide written guidelines. That's just me personally, besides me being a researcher, I do function as a legal expert for physical therapy cases and stuff. And I've gotten a couple of cases over the last 10 years, that involved interventions like taping. So I think it's important to have some type of instruction, for clients to prep the skin, monitor it during the treatment and also take it off. And I'll show you that here in the coming slides. Important point at least in my opinion. As far as referral, what's interesting is a lot of the clinicians surveyed, weren't kind of married to any of the manufacturers. They really sent people to generic websites like Amazon, which I do personally. I don't have a manufacturer that I prefer, I get the cheapest tape. I found some cheap tape that I like and it's cheap. I wanna control cost. Also retail stores, and we know that those are tough right now, manufacturer websites only 26%, and then some people sell it in their facility.

We're seeing just some general trends for everyone to kind of round out this section. And so bottom line is we can see that the outcomes used clinically, are in the research which is nice. So we can see that, we're seeing some translation from research to practice, and we can see that live tends to be the best mode of teaching our clients. And then the referral patterns are pretty much based on every clinician individually. Module six. To me this is a really cool and important section. To me just like the prior module on tape application, remember tension and direction. To me this is another important aspect. So if you guys are writing notes I think this is a really cool topic because, we're looking at how clinicians teach their clients to prep the skin, remove the tape, and how long they should wear it. And I think that that's important because we're seeing more and more injuries come up, by people leaving the tape on too long. They may take a hot shower, and activate the adhesive and then pull it off. So we're seeing a lot of some of this stuff come through, and a lot of the tape manufacturers, are really hammering proper procedures on how to educate your clients. So let's look at survey respondents and what they thought. So the first clinical question in this section. Is what

are the best methods to prep the skin and remove KT. Here's your typical guidelines that have been taught, over the last 30 years. If we look at the diagram and we go from left to right, pretty straight forward inspect the skin for any issues. Trim or remove body hair in the area being taped. Before you tape somebody avoid lotions, topicals, gels, unless you're using the infused, or you're using a topical analgesic. Clean the skin and prep it, and then you put the tape on. In my experience, interfacing with a lot of clinicians on a weekly basis, a lot of people may do basically steps one, three, and four. They don't necessarily tell people to trim or cut their hair. And I thought that that was an interesting trend that I've seen clinically.

When we ask this question, to me, this is another kind of surprising finding, is we asked them Q1 is, do you instruct clients to prepare their skin before applying KT? 64% said yes, 36% said no. I was a little shocked by that because standard of practice dictates that we have to, especially because it's considered an intervention, we have to provide proper safety measures in education. So I thought that that was interesting. And then also too, we went a step further with Q2 and said hey, if you said yes, what instructions do you provide to your clients?

And this was a multiple choice question where they can pick as many choices as they want. 53% did follow cleaning and drying the skin. And we're gonna go clockwise on this. 37% did avoid lotions. And then only 12%, followed trimming and removing body hair. So I thought that that was interesting is, we have over 350 respondents, that just take people, and they don't take the time to really kind of educate them on prepping it. So I think that that's an important aspect because an expert for the PT board of California, and also in my neck of the woods, we're seeing a couple of these cases come up, where someone gets injured by the skin, and they rip it off and they create a lesion, and then they blame the therapist. So something to think about, we need to take that extra step in protecting our clients and ourselves. Just a thought humbly for me from my cell phone app. So then we kind of go to our next topic. Removal

instructions. And that feeds into a couple more things is, what are the guidelines? Standard guidelines say that. What do you do you remove the tape slowly, you lift up the tape, you tug the skin up underneath, and you slowly remove the tape, and you don't rip it up. That's obviously. If the tape's been on for a few days, it's really sticky the adhesives activated, you can put oil on it, like a mineral oil, you can even put olive oil I don't know I've had people put all the oils on it. A lot of people believe that you can use adhesive tape remover. That's kind of like with athletic tape, but that can steam the skin, and also you can get into the shower and get it wet. The only thing is I've seen different things where some manufacturers are like well, if you're taking a hot shower, you're gonna activate the adhesive. So try to do it in a cool shower or warm shower. So that's one thing. And then obviously to some manufacturers recommend pulling in the direction of the body hair. Don't pull against it. And then obviously after you tape, you clean the skin, get the adhesive off, inspect for any skin reactions, or any adverse complications.

So those are the guidelines that are taught, by the manufacturers. Let's see what respondents are doing. We posed a similar question, where Q1 is do you instruct your clients to safely remove KT? I was surprised we had 23% that said no. So the majority though of clinicians are like, yeah, we have to instruct them. And then we went to Q2 where we said well, if you said yes to question one, what instructions do you provide? And using the multiple choice, we can see that 43% talk about removing it slowly, 18% only used mineral oil or adhesive remover, and then 10% with the tape. So we're seeing some minimal guidelines, but we're seeing a fair amount of survey respondents, saying that they don't really provide, any type of instruction. And to me I think that's an important point, because we wanna protect our clients or our patients and ourselves. So something to consider, I have written instructions that I send in a PDF to all my patients, so I think that that's important to have, because then I can put it in their chart, as documentation. And then in my daily notes, I put it under patient education. So I'll say application and removal instructions reviewed by patient, patient sent handouts.

And so to me that's another layer of protection, and that's based on what I've seen in some of these legal cases. Just some humble thoughts for the group here, and just something to consider. Next clinical question in this category. What is the recommended average and maximum time, to wear KT, KT tape? And I think that that's so important when we're talking about KT, how long do we wear it? And so when we asked the respondents, we basically came up with the same two questions that were kind of similar to others is, what is the average time do you recommend? And then the second question is what is the maximum time? If we look on the left, when we look at average time, most respondents recommended between two and three days. So that's a little over 70%. Or 70% around there. So we could see that 70% are saying okay, on average wear two to three days.

But it's interesting 6% don't recommend anything. So again, I thought that that was interesting because I would have thought that I would had 100% consensus, on professional saying hey, I only want you wearing it once a day, twice a day or whatever, but we have 6%. 60 to 70 of the respondents saying, that they don't provide any recommendations.

So now how about maximum wear? It's interesting is, when we kinda broke it up, we didn't have the two to three day. We had clinicians.... Almost about 60% of clinicians say, you can wear it for three days or five days. And I thought that, that was interesting. So even though the average is two to three, maximum is three to five. This is consistent among professionals, but I was just surprised. And then also we have 10% who don't recommend anything. And then some people believe that two days or even four days is appropriate. So again, I think it depends on each individual patient, and also too, we gotta go back to what are the goals. What are you trying to accomplish taping somebody. If there's no goals don't tape them. And so I think that that's important to always keep in context. So when we talk about wear time and we look at the literature, we can see here, I didn't put an asterisk as far as negative because these are just

studies that have reported wear times. So ever since 2016, all the way through 2020, we've had different groups of researchers study the effects of a three, four, five, six day, kinesiology tape intervention. And so we understand that the consensus is, most researchers have studied a wear time of three to seven days. There's moderate evidence among these studies, that if you wear the tape for that long, you're gonna have some positive changes, in balance, myofascial pain, it might help with chronic ankle instability, subacromial impingement, rheumatoid arthritis, knee osteoarthritis, total knee replacements, lymphedema, hamstring, extensibility and quadriceps. So again, these researchers have studied all these medical conditions, with people wearing tape three to seven days. That's not an isolation. With all these studies KT was an adjunct therapy to other therapies.

So the subjects in all these studies either did exercise, did some type of myofascial work, like foam rolling, they did stretching and all that. So KT, as part of a multimodal treatment strategy, may be good, if they're wearing the tape over time. And that's one thing I wanted to impress upon people for this section is that, a lot of these studies are saying, if a patient wears the tape, for a few days, it starts to have some type of neurophysiological effect.

So I think that that's interesting to look at, but remember though, a lot of these studies did not look at KT and isolation. And we have to consider that in as the outcomes, because we can't just isolate it as a primary treatment, with most of our clients. So something to think about. So then as we go down to the bottom line, we can see that, there's really no research right now on KT skin prep or tape removal. But there is some evidence in the medical literature, that have showed some adverse reactions to tape and adhesives. Also too, we can see that the wear range is three to seven days, in the research. And that's pretty much between the three to five days it's pretty close. That's reported by respondents. So again, we wanna rely on best practices, for skin prep removal. We need to really always use our clinical judgment. So those are just some

summaries of that. So now let's kind of look at module seven. KT precautions and contraindications. And so the next clinical question is, really what are the big kind of the most obvious precautions and contraindications? We can see here too, we have our general ones that are on the left precautions. And I'll highlight a couple. The big ones is really skin allergies, any type of weakened or broken skin, older individuals with thin skin, medications that ultra sensation, anybody with any type of systemic issues that may create some type of neuropathy and stuff like that. So those are the big ones or even patient intolerance. I think that that's huge. On the left, we have our list of obvious contraindications. Skin infections, skin rash, open wounds, blisters. Obviously you're not gonna tape someone over their eyes or sensitive areas. There's a lot of these precautions and contraindications. Unfortunately they're not steadied in the evidence. The body of research notes these, but if you if you guys go back to the first presentation in this series, I give a more in depth discussion, on general precautions and contraindications, for all of the myofascial interventions.

If you guys go back to that first presentation, we kind of dig a little bit deeper into these issues, but these are just for you as a group, as professionals, just to keep these in mind, and screen the client before you use tape. It's that simple. And so I just wanted to put this in here just to make sure our discussion today is complete. And then as we surveyed the respondents, we asked them similar questions. Which precautions do you believe are the most important? And Q2, which contraindications do you believe are the most important? And again we provided them with multiple choice questions, and we can see that it's pretty much in line with the standard, is most of the participants in the survey believed that skin irritation and itchiness pretty much the most important, then skin. Contraindications, we have about 66%, really looked at skin allergy, open wounds, is obviously 33% each. And then obviously lesser would be inability to communicate, which I thought it was interesting, and also DBTs. We can see that everyone's being pretty safe I think on this level, but it's nice as a presentation to show that, 1000 different clinicians are in line with what we're thinking. And then also too,

when we talk about side effects and stuff, please consider skin damage is one of the most. So as you guys can see from the image above, we can see like here's KT tape, would like the histamine response and the irritation, some people call this a cellulitis whatever you wanna call it. But you have to monitor your client for skin damage. This is the most widely kind of reported among all the manufacturers that I've interfaced with and stuff. So just remember that the main adverse effect would be the skin damage from the tape, being on too long or applied with too much tension. So remember, keep in mind, a lot of manufacturers believe that too much tension, causes skin irritation. Keeping the tape on too long, not prepping the skin properly, and not removing it properly. Those are all factors that can irritate the skin. And then that could be considered intergenic in some circles.

So please keep that in mind that's just kind of a quick summary. So bottom line is again, we don't really have any concrete studies that have looked at the efficacy of KT tape with different medical populations. There has been KT tape applied to people with certain neuromuscular pathologies, everything from spinal cord injury and stuff like that. Those are more looking at the efficacy of it with the neurophysiological effects etcetera. But there hasn't been really any studies to look at precautions and contraindications.

We have to consider those two different constructs in the research. You really have to use your clinical judgment, when you're taping people. And again go back to the why behind it. Why are you doing it. Module eight. On the home stretch everybody and then we can feel some questions and stuff. So when we talk about the KT research synthesis, we got through the survey questions, we're seeing that in some categories that we surveyed people, there's some agreement, and there's also some major diversity. So the question that we ask ourselves and everybody and even yourselves in this lecture, what are the main issues in the KT research, that has led to the overall evidence being weak? Because as you know too, you guys look at the local journals,

there's always a steady every month saying that KT worked, and that KT did not work. That's the big problem. In my humble opinion as a clinician and as a researcher, I've come up with two kind of broad ideas, that I've been posing throughout this lecture today. And that is that number one is if we look on the left, the KT studies use different tape brands. And to me this is a big point because two studies came out, from 2018 to 2020, they looked at over 30 different KT brands. And these researchers, used a mechanical machine, to lengthen pull broaden, each of these KT tapes. Does that make sense? The machines actually tested the stress and strain, they looked at Young's modulus, that's the strength of the tape. They looked at what's called the grommet which is the thickness of the tape. They went really in depth. They found no correlation, among all three 30 tape brands.

They're all made differently. So that means some of the tapes stretch to 140%. Some of the tapes only stretch to 100%, some were stronger than others, some were thicker. So that's the problem is if you look at the last 30 years of research, there really is no consistency of using one brand of tape, and a bunch of independent researchers, studying all these clinical questions, that we pose in our survey. To me that's a huge point right there. We surveyed 1000 people great, but we asked all the questions. How hard do you pull the tape? What angle do you use? How do you teach them that? How long do you think your clients should wear the tape? I've used different tape brands, and there's some brands that can last longer on individuals than others. There's some brands that have stronger adhesive than others. So I think that that's such an important point, when we look at this as educated clinicians say, wait a second, the research is terrible because we're not studying, each brand and we're not consistent. To me that is an internal validity issue of the research. And that to me, that's a huge confounding variable, to the last 30 years of research. And I'm not trying to be negative. I'm trying to be positive because I see KT tape in my practice as a clinician, do some pretty cool stuff. It's not perfect, but it's a tool in my toolbox that I can use. Now as a researcher, I question and say wow, there is no really good consistent

research among all the different tape brands. And then that leads to our second construct. Which is the KT research has variable outcomes due to the different study methods. So we have hundreds of researchers, from athletic training, to physical therapy, occupational therapy, to chiropractic, to even some of the medical doctors. All these researchers are doing research. Guess what? They're pulling the tape a different way. They're using a different manufacturer tape. They're using different outcome measures. They're using different populations of people. They're using athletes who constantly tape. So a lot of these researchers, are using what's called samples of convenience, where they they'll go to a university and grab a bunch of young individuals, or a bunch of athletes, who have been taping for years, and they're biased. So we haven't seen a consistent theme, among researchers when it comes to steady methodology.

And so that's another huge flaw because if we look at the studies, and everyone's pulling the tape at different tensions, everyone's using different brands, everyone's using different sample populations, and everyone's using different outcome measures, how can we ever have a consensus? So this to me has led to the tornado I'm gonna call it, of confusion, around KT tape application. Because when you combine these two variables in my humble opinion and again, there's gonna probably be other researchers who may counter what I'm saying that's fine.

But in my humble opinion, this is leading to an inconclusive, total body of evidence. And so all of us here as clinicians, we have to rely on our clinical decision making. And personally I believe that we're here to help tape people, and so I think we should just use our best clinical evidence, and that's level five evidence right now. Clinical level evidence to apply this because of all these poor methods. We're eventually gonna do a systematic review, trying to break down, all these studies based on manufacturer. Unfortunately we started the systematic review last year, and we pulled like 200 studies. A lot of these researchers don't report what tape they used. Or they use an

off-brand. With all these different tapes being used, we don't really know the effect because they're all manufactured differently, and they can all stimulate the myofascial differently. Or they may not. It just maybe speed that placebo effect. I don't have the answers, but being a nerdy guy, I think that these are two plausible constructs, that as professionals we can think about. And so hopefully that's gonna help everybody come to a consensus a little bit at this point in the research and stuff. And so other researchers have agreed with me though. I'm not the only, we've had other research from 2016, that it looked at all the different tape brands, 2017 and 2019. And then there's a study that just came out a few days ago, that looked at some different tape brands. And that's why I wasn't able to put it in the PowerPoint. It just came out online it's not fully published yet. But they looked at other tape brands and that's why I said 30. We're seeing research from 2016 to 2019, where they're measuring all the properties, they're finding out that there's no consensus. So again, I'm not the only researcher who is coming to these conclusions.

Bottom line is we have those two main issues in the research. And so based on that, we got to rely on our clinical judgment. All right. Let's move forward. Let's talk about our last topic. And then we'll have a good maybe 10 or 15 minutes of some questions if we want to, but I also wanted to besides diving into the world of KT, talk about standard athletic tape. Because I know a lot of us who work in the outpatient setting and all that, we're still using the good old athletic tape. And so when we look at the nomenclature of using athletic tape, we can't mix it up from KT tape. Typically the cloth athletic tape, stretches a tiny bit but it doesn't have the elastic fibers woven into it. And it's not woven in a specific pattern like KT tape. So in the literature, if you're gonna look at the efficacy of let's say taping an ankle, and preventing ankle sprains, or look at the response as far as proprioception, or stability and chronic ankle instability, does tape stabilize it? You have to use these search terms. Athletic tape, sports athletic tape, non elastic tape, rigid strapping tape. Those are the ones that I had to use to really find this research, because when you go tape, most of the KT stuff does come up. When we

look at the definition or the design of it, we know it's typically a non elastic cotton base tape. We know it's woven not to stretch. The focus is to provide support. We know that on the athletic tape we always kind of call it Johnson and Johnson tape where they make the most. But when you look at the tape, it has very little adhesive on it. So the standard tape job as you know, is we spread adhesive on the skin, we do the prewrap, and then we apply the tape. This is opposite where Kinesio tape is applied directly to the skin. So no one's looked at using KT with prewrap. That's kind of interesting. Because remember, most of the KT is meant to stimulate not just provide support. So the indications for athletic tape is mainly used for sports, injury prevention, and also post-injury recovery.

Like if you have a swollen ankle, we might do a tape job. It's called a basket weaver we might do a tape job, to help provide compression, to reduce swelling. But a lot of clinicians are foregoing the traditional tape job, and using different Kinesio taping, using the different specialty tapes. So just something to think about. So common brands that we've seen, we talked about Johnson Johnson they're the most popular. Mueller, Jaybird, P-Tex, McDavid and Cramer. Those are the most that we've used and sports athletic trainers use.

And so when we talk about the scientific theories, what's interesting is, a lot of the athletic tape research, pretty much points to the two similar theories as in KT tape and the other, myofascial interventions. Is that the athletic tape, may provide mechanical structural support. It may facilitate the muscles, support it, but also though too, they've looked at this stronger thicker tape, on neurophysiological responses. And so those two have done that. And so the problem is that you could get that mechanical support or the mechanical effect, and also get a neurophysiological effect. But unlike Kinesio tape, standard athletic tape stretches out over time. And that's a problem because you're gonna lose these effects theoretically, versus Kinesio tape, because the elasticity will keep it shape. So that's something to think about. If a lot of people

combined athletic tape, Kinesio tape, sometimes you can use more skin in your tape job, sometimes they use the more rigid strapping tapes, and all that in their tape. And so when we look at the therapeutic effects, of athletic tape, again the research especially from Kaminski and all that, they did a good job down here, it was a good systematic review, is they're really using it for mechanical support, greater neuromuscular control, and also psychological benefits. It's basically putting on an ankle brace. That's what a lot of this segment on therapeutic taping with athletes or active individuals. That kind of opens up that clinical question is, how long does athletic tape keep its strength and shape, thus how long is it gonna have effects on the body? When I looked at the body of research, gosh, we've had research ever since 1997. Look at this question. They looked at the question, and they found that athletic tape, only keeps its strength, from 20 to 40 minutes. And I thought that that was interesting because one study that would be great, is looking at the combined effects of athletic tape, with Kinesio tape maybe on top of it.

To keep that shape. So think about this. If you have an acute injury that you're working with, a lot of people might do a full ankle tape job with Kinesio tape, which may not give you the full support, but it may keep it shape, and provide more neurophysiological benefits. If you have somebody that you need to prevent talocrural movement, or prevent subtaler movement, or to really get the ankle to stabilize, then maybe using a traditional athletic tape job might work. You just have to realize, that it's only gonna last 20 to 40 minutes. And I think it's an important limitation, but it can also be an advantage. As we're looking at therapeutic taping and stuff, we have to realize that all tape has strings and limitations and stuff. When we look at athletic tape itself, we also have another clinical question. Does it help prevent injuries? I know a lot of us in the group may work with athletes and may not. But I don't know if you've seen it, but a lot of sports teams, tape over the shoe. It's called spatting. And so they take over the shoe, or all the football players get their ankles taped. And so we're wasting so much tape with that. A lot of the D1 universities especially in football or different sports, just

kind of prophylactically, tape people as part of the pretraining routine, that all these sports teams do. And it's very common. And so if you're watching like let's say a high school football game, you'll see a football players ankle, is white because they taped over the shoe. That's the one thing that's called spatting that's been done, or they have both ankles taped. And so the question is does it really help prevent ankle sprains? And so there is some weak to moderate evidence. I didn't put the asterisk because we're not really focusing on KT, but ever since 2010, to Kaminski who did a really good study in 2019 systematic review, does show weak to moderate evidence that if you're using the non elastic tape, it may prevent injuries. And really most of these studies looked at foot and ankle. They didn't look at any type of knee or other joints, and that, and from there. So just remember that, non elastic tape has some pretty good research as far as looking at prevention. I have to appraise the evidence as it is, but I still think it has some decent evidence with that.

So now from there, when we look at common precautions and contraindications, they're really gonna follow the same general kind of obvious ones as Kinesio tape, and the other myofascial interventions. I want everyone to refer back to those slides or go back to the first part of this lecture series, where we cover that. So nothing new as far as the tapes. One thing to also remind you too, is athletic tape especially the spray on adhesive, can irritate the skin. Also though too, I've been taping for 20 years as an athletic trainer, one thing I want you guys just to keep in mind especially with the non stretchy tape, or the non elastic tape, is that you can easily tape the person too hard. You can pull the tape too strong, you can cut off blood flow, their foot can feel numb. Also too, if you're not taping cleanly around a joint, you can promote skin damage that can lead to a lesion. So basically some of my athletic training students or some of my physical therapy students, I'll teach them the tape jobs, and a lot of times they'll tape someone's ankle, and they tape it too hard, and that person can develop a blister. So the first thing you you wanna do is prevent blisters or skin damage by pulling the tape too tight. There's a lot of ways to tape the ankle and all that. There's a lot of variable

ways of doing things, but those are just some general indications, and precautions and side effects that we humbly wanna share with everybody here. So bottom line on this is, that we know athletic tape has weak to moderate evidence. We know it only lasts 20 to 40 minutes, and we know that it restricts motion, mobility, and it does have some type of neuro physiological effect. But also remember too, that you wanna be proficient at your tape jobs especially with this type of tape, because you can easily tape someone too tight, or you can easily cause skin damage if it's not done properly. So just some thoughts there, if we're gonna tape somebody. All right, everybody. I wanna thank you all for attending, our fourth lecture in this series. And I hope everyone enjoyed this evidence-based application, of KT tape. And so now we've got a few more minutes that I would like to open it up for general questions and answer, and I'll do my best as a clinician and researcher to give you guys some thoughts on this topic. So let's go back to our hosts and we can ask a couple of questions, and let's discuss some of the cool stuff.

- [Calista] All right. Make sure everybody you put your question answers in the question answer pod. There's one here. I'm not sure if you see that Scott it says, how do you spell the taping over the shoe?

- [Scott] Yes, it's S-P-A-T spat.

- [Calista] Spat, okay.

- [Scott] And they call it spatting tape. Christina has a great question. They call it spatting tape. There's Mueller's company, they actually have created tape, to go over shoes. And so if you do a Google search, it's called spatting tape. It's very interesting. And so it's very popular among football players. And then also you guys can go to videos, and look it up on YouTube, and you'll see how they take over a complete shoe. Very interesting. So from there, next question.

- [Calista] And this might be in regard to that it says, how do you apply topical not infused and get the tape to stick?

- [Scott] So a lot of times, if we are using the non elastic tape, it's a spray glue basically. If you have someone's ankle, you would spray the skin to make it sticky, then you would put on a soft cotton prewrap, then you would tape it. There's some videos like if you go to YouTube or whatever, and you just go ahead and do a search for ankle taping, you'll see a couple of things where you have it's called taping adhesive, that we spray directly on the skin.

- [Calista] And the next question's asking does Leukotape have similar results to athletic tape?

- [Scott] Yes. And crystal that's a great question. Thank you. Leukotape is that rigid strapping tape I kind of use it as general 'cause Leuko is a brand. But yes, that's a great way to do it. So a lot of times if I'm doing more of a athletic tape job to prevent ankle motion and support it, I'll do the white athletic tape, then I'll do Leukotape as my last tape around the ankle. So if I'm doing like a figure eight, or what's called an ankle lock, a heel lock, I'll use the Leukotape. So I think that that's great. Also one last thing is, a lot of times if you're gonna do strips around the ankle, like medial or lateral, a lot of times people will put the Leukotape on first, then they'll finish up and they'll close out the tape job, with the typical white non elastic tape. So yes.

- [Calista] Another question. So only topical application with athletic not KT?

- [Scott] Yeah, Mitzi that's another great question. There's really no research on combining KT with the white non elastic athletic tape. I've had some clinicians, use KT as a prewrap, but I think you have to remember that you're taking in adhesive tape,

that if you pull it 100%, it's gonna really dig into the skin. And then you're gonna take a really hard non elastic, and compress the myofascia even more. So again, this is just something humbly that I recommend to separate the two until we actually have some research, that look at the two. Thinking of it you could put down some prewrap that kind of that cotton wrap. Do some KT around it, then put the athletic tape. But again if you're adding too many layers in my humble opinion, I've had to cut the tape off because it gets too restricting for the athlete. So the more tape you apply you're basically putting on a cast. So you wanna try to layer it as much as you can. So I think the other suggestion was, maybe a couple strips of Leukotape that are really strong, and then you encase it with the athletic tape, that should give people some support. Just in my humble opinion. So please try it and see what you think.

- [Calista] All right, is KT useful on SI joint issues?

- [Scott] Yes. So that's a hard one because I'm personally clinically, Yes. Whatever manufacturer teaches is that I love to do kind of the start tape job. Does that make sense? I really like to do like the star, or whatever technique over the SI joint. So lumbosacral issues. And honestly I think that that's a great way of taping it, and I do see effects clinically. I have more of subjective reports, and my patient outcomes are really strong and stuff like that. So I think that that's really, really kind of important for that. And then when we talk about Amazon and all that, I think Julie has the next question. Julie I'm gonna have you email me or get on Facebook, or whatever, and then I can send you the brand that I like. So why don't we do it that way. So we can do a sidebar just because I wanna be respectful to all the manufacturers and the diversity among the group. So if you can send me or anybody here, if you just wanna drop me an email, I'll send you some of the generic brands that have worked well for me in clinic. Okay, All right. And then I think that's pretty much fielding all the questions. I wanna spend the last two minutes going over some of the quiz questions if we have time. Is that okay our hosts, are we okay for that?

- [Host] Yes we are fine.

- [Scott] Okay, thanks. So if everyone's writing notes I really like to go over question number one, in the quizzes. What type of precautions should we take when administering the kinesiology tape intervention? And I really believe that we should look at the skin allergies, and medications that ultra sensation. So that'd be answered number b. I think that that's important. Question number two. What are the two biggest limitations in to the existing body of kinesiology tape research? I think we deciphered it. The answer is going to be a. Different manufacturer tape, and different application protocols. Question three. What are two topics should the professional discuss to the patient before applying kinesiology tape? Answer b, c, how to safely apply the tape, and safe methods for taking the tape off. Question four. The existing body of research documents that KT, elongation, length, range and motion, excuse me, elongation, length, range for treatment of musculoskeletal conditions in sports performance. What does it say? The answer would be to number four b, most of the research respects the range between 25 and 75%. Sorry I was tongue tied on that one. I'm from there. Question number five. Question number four's b, question number five, is here's the question. The recent survey of healthcare professionals reveal that blank of respondents use kinesiology tape for the blank affects. The answer is gonna be see c. 40% on average of respondents, used it for a placebo effect. And I thought that that was an interesting topic. Question number six. What are the two scientific theories used to support the efficacy of KT? The answer's c. Mechanical neurophysiological. Question number seven. What are two KT contraindications? The answer is a. Skin infection and active cancer. Question number eight. How long does external sports athletic tape typically last? Answer is c. We're gonna say approximately about 45 minutes. We're gonna round it up a little bit. Question number nine. What is the main differences between KT and sports athletic tape? The answer is a to number nine. Manufacturing process, and the elasticity of the tape. Last question, question number

10. The existing body of KT research is mixed. There is some research that supports its efficacy for three conditions. What are they? The answer is a. Myofascial pain, lymphedema, right swelling, and specific neurological conditions. That's what it supports overall. So there's your answers to the 10 quiz questions. All right everybody thank you so much for attending. I hope everyone enjoyed everything, and I hope that everyone enjoyed this lecture series, and please feel safe and comfortable to email me, if you have any questions, about anything I'm here for everybody. And I hope everyone stays healthy and safe, and have a great weekend. Thank you everybody.

- [Calista] Thank you so much Scott, for once again sharing your expertise with us today. And if anyone missed the first three courses that you did for us that were also wonderful, they are on our site and you're available to watch the recorded version. Have a great day everyone and a great weekend.