Respiratory Muscle Strength Training and Speech-Language Pathologists: Part 2
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- [Amy] And at this time, it is a pleasure to introduce Denise Dougherty today who is presenting part two of her Respiratory Muscle Strength Training and Speech Pathologists two part series. And Denise Dougherty owns and operates a private practice in Indiana PA, where she conducts therapy with children and adults. She received her bachelor’s in communication disorders from Marywood University and her master’s from St. Louis University. Since 2007, Denise has served on the expert work group of the physician's office quality measures project for quality insights of Pennsylvania, working on initiating quality measures for CMS to improve effectiveness, efficiency, economy and quality of services delivered to Medicare beneficiaries, specifically medication review. She is a past president of the American Academy of private practice and Speech Pathology and Audiology. A past member of ashes healthcare economics committee, and co editor of private practice essentials. A Practical Guide for people speech language pathologists. Denise works as a forensic speech pathologist and expert witness and litigation involving dysphasia choking deaths and surgical errors. So welcome, Denise, it's great to have you with us today.

- [Denise] All right, I'm hoping you can hear me. Okay, so this is part two. I am going to give you information on our disclosures, so I am receiving an honorarium from speechpathology.com. And Emmy did a great job giving you all of my other qualifications. So, thank you. And I want to I just mentioned these particular points. I'd like to thank Aspire they are the manufacturers of the EMST 150. The EMST light 75 and the IMST, which are all exploratory and Inspiratory muscle Strength Trainers, they've provided tools and use of the images, studies and protocols. So I want to thank them for that. I also want to thank PN Medical for their information and studies and images on the breather, which we'll be looking at later in the presentation. If you were involved in part one, you've seen the anatomical images from Ken Hub, we are able to use those images for teaching but unable to allow you to reproduce them in your PowerPoints. So if you go to Kenhub.com, you'll be able to type the muscles or the
anatomical structures into the search box and be able to pull that information up for viewing. Your other option is to go to Google Image type in the name of what you're looking for and you'll be able to pull up drawings x rays and images for viewing so if we'll help you with what we're talking about. For the learning outcomes, after this session, you'll be able to list tools that are available for Respiratory Muscle Strength Training, describe the protocols for treatment for inspiratory and expiratory muscle strength training and also identified contraindications for treatment. Course description, we are going to look at the tools that you'll see for Respiratory Muscle Strength Training, we'll look at the protocols for both inspiratory and expiratory. And also the contract indications for use.

So our agenda, I will be talking about the tools and protocols. And what I would like to do is to encourage you to continue to investigate the devices that we talked about read, the studies that are available on their websites specifically Aspire NPN medical for their respiratory muscle strength training tools. You can also look at Google Scholar for research on Respiratory Muscle Strength Training. And I will also would encourage you to continue to seek out education continuing education on these devices, is going to certainly help you improve your comfort level working with your patients with these particular tools.

Both companies Aspire NPN medical have lots of webinars and information on their websites that you can take advantage of so I would seek out that information. The other thing I would recommend is that whichever tool you are looking at using, I would recommend that you have one for yourself. That way you can work through the protocol I know what it feels like. And you'll have a tool that you can use for demonstration in your clients therapy program. Sometimes, you know, they do better if they can see you do it rather than just a verbal explanation. So that is certainly helpful. Now, last time, in part one, we spent a lot of time on the respiratory system, we looked at the lungs, the airways, the bronchitis, the alveolar sac, and we do have that
connection between the cardio and respiratory system. So it's important that we have adequate blood oxygenation, not only during rest, but also exercise. So all of these circulation needs to be going on. Now when we have cardio respiratory conditions, we can certainly alleviate symptoms sometimes briefly, with our medications, but that won't get to the root of the problem. It's not going to solve it. What they have found with their studies is the only intervention that seems to make a long term difference is Respiration Muscle training.

And we can do it both for inspiration and expiration, or you can do one or the other depending on your tool. So when we take a look at tools that your patients may be using, we most likely have seen the incentive spirometer. And that is usually provided to patients after surgery or when they've been admitted for pulmonary diagnoses. It used to be that when a patient would come back to their living situation or back to home, they always had an incentive spirometer in that bag they brought from the hospital, not that they used it, they usually tossed it but they had an incentive spirometer I'm not seeing that occur as often anymore. You may also see positive exploratory pressure devices, the PEPS.

This is what I'm seeing more and more come back from the hospital with patients. It's given to the patient who have pulmonary conditions and it helps with the clearance of their secretions. What we're going to be talking about is the Respiratory Muscle Training. So inspiratory expiratory and the different tools that are out there. Now the inspiratory muscle strength trainer and the expiratory muscle strength trainer, those are products of Aspire. The breather is a product of PN medical. So these will allow you to practice inhalation and or exhalation against resistance. So we're strengthening those respiratory muscles, just like we strengthen the skeletal muscles when we're lifting weights and going to the gym. We're fixing or strengthening that respiratory system. Now the incentive spirometer I it is going to help the lungs recover after you've had a surgical procedure or you have a lung illness and the lungs become weak after
prolonged disuse, so if you’ve been bedridden after a surgical procedure, we don’t want you to end up with the pneumonia. So we’re trying to work the lungs. Now, there are conflicting results out there. As far as the benefits, there is some evidence that it does improve lung function, that it can help reduce the buildup of mucus, that it can strengthen your lungs whenever you’ve had an extended rest, and it can help lower your chance of lung infections. That has been the rationale for using the incentive spirometer over the years. So what you’re looking at is sustained maximal inspiration and you may see it abbreviated as SMI. This is considered to be part of your Bronco hygiene therapy.

What we’re trying to do is mimic just that natural side are you on and we’re going to take a long, slow, deep breath and exhale. So we get biofeedback. When we are doing incentive spirometry, what you’re supposed to be doing is inhaling slowly. And you really should be inhaling for at least a minimum of three seconds. Usually they’re saying three to five, and then you breathe out normally. Now if we go back to take a look at the incentive spirometer, you see the ball? Well, what happens if you breathe too fast? That ball shoots to the top, and that’s not what we wanted. What we want it to do. If you breathe into slowly, then the ball stays at the bottom. It used to have an arrow here. Yeah, it always works in the demo.

Oh, there it is over there. Okay, so the ball stays at the bottom. If you’re breathing out too fast, it’s gonna shoot to the top, we wanted to stay in the middle, that is our goal. What they’re recommending that you do is 10 to 15 breaths every one to two hours. So it’s ongoing practice. And what’s that is going to accomplish is going to activate the inspiratory muscles tries to reestablish a normal pattern of the installation of the lungs in it helps with the pulmonary pressure. However, it does not provide the Respiratory Muscle Strength Training. It doesn’t provide any workload for those muscles when you’re inhaling. Now it can help prevent those post operative complications of surgery but we’re starting to see a little bit of an issue with some of the evidence as far as the
effectiveness. So the guidelines seem to be changing, and I'm seeing the physicians in my area move away from the spirometer to other devices, you may be seeing the same thing in your area used to be, you know, pretty common. Now, what I'm seeing more of are the PEPS. And this is your positive expiratory pressure device. So you have a mouthpiece or a mask that you're breathing through. The air is supposed to flow freely on inhalation, and then when you exhale, you're exhaling against resistance. And what they're saying is that exhalation against resistance should take about four times longer than the time it takes to inhale. So there are benefits from this. It improves your airway clearance.

And what happens with the PEPS is when you're doing that inhalation, that air that you inhaled, gets better hind the mucus and it starts to push it out through the airway so you can trigger a cough and expel it. It helps keep the airways open. And there are some devices that in addition to positive expiratory pressure, there is an oscillation function and also latorre function. And that helps with mobilization of the mucus. So you may see it abbreviated is OPEP. There are a number of products out on the market. These are the ones that have the oscillating function. What I don't have permission to show you images of these. But if you go to the web and you Google these devices, you'll be able to pull up the images and see what they look like.

What's up so interesting is you can buy these at Amazon or a variety of medical supply websites. And there's a part of me that really has some concerns about people just going shopping for these on Amazon in treating themselves. So yeah, there's a method to doing this but you can purchase these. There is the flutter. The one that I see being used more frequently at my area is the acapella flutter valve and we'll take a look at that. There is the Aerobika the V-PEP the RC cornet we'll talk about, but there is a number of products out there that is supposed to help you move the secretions up far enough that you can cough those out and clear. The purpose of the oscillation is to create vibrations. And those vibrations that are created when you exhale is what moves
the mucus away from the airway. So what it does is it takes over or mimics the beating of the cilia that is supposed to move that mucus up. Normally, after you are working with the device, what you're supposed to do is cough to clear the mucus from the lungs. And if you still have a problem, they're recommending huffing, like a strong to try to clear like you were if you had breadcrumbs in your throat, that’s the but they usually recommend, kind of huff that out to get rid of that mucus. So when we take a look at the flutter I this is a mucous clearance device in it has actually two stages whenever you're doing therapy with the flutter. This is shaped like a pipe and it has a hard plastic mouthpiece at one end. The other end is a perforated cover and in between there is a stainless steel ball and what you're going to do is exercise with this positive expiratory pressure device. And this is going to help with conditions that actually produce retained secretions.

So we can use it with the COPD here, the patient who has asthma, bronchitis, cystic fibrosis, a number of disorders could benefit from this. Now there are contraindications. And what you'll see with the devices is they usually have the same contraindications. So if it’s a contraindication, for one, most likely it’s gonna be a contraindication for them all. The two that they mentioned, are pneumothorax, excuse me, or an overt, right sided heart failure. Now, I'm not gonna know that. But again, these are devices that are going to be used in the hospital environment and the patient is discharged with them. I'm not changing any settings or making any determination here.

So whenever you're doing any of these devices, including the breather in the EMST, IMST you need to have your cheeks tense because that helps you to direct the air where it needs to go instead of puffing up the cheeks. And you also want to suppress the urge to cough until you’re done with all of those breaths, the recommend in stage one where you're going to loosen the mucus and start to get it moving, that you do five to 10 breaths and every time you have that flutter exhalation, it moves that mucus a little bit further up the airway. Then you do another two breaths, and that is supposed
to move the mucus up to a level where it’s going to trigger a cough, and then you can expel it. So you do the cough, or you may need to do the huff as well. If the patient has a lot of thick mucus, you might have to go through that stage one several times that is five to 10 breaths before you can actually cough and clear that mucus. Their protocol suggests that this is more of a Goal based therapy than time based your goal is to eliminate the secretions. They recommend this can be done within five to 15 minutes so it’s not so much time it’s did you get rid of the mucus, they recommend morning and late afternoon sessions so twice a day and if you have fatigue, they recommend breaking it up into more frequent sessions rather than doing one long session. Now this is what I see a lot of my patients coming out of the hospital with it is the acapella flutter valve. There is a dial so if we can try that little pointer again.

There it is, okay, on this end, there is a dial and you rotate it towards the plus side to increase resistance and you rotate it towards the minus sign to decrease breathe resistance so you’ll have the plus and minus sign on the green or the blue part above the dial, and that will change your settings. Then we have our mouthpiece on the other end. So in between is a steel ball. Let’s get rid of that arrow, with this one really important for posture. So you have to sit up with this one and then recommend tilting the head so you can keep the upper airway open with this. You’re gonna take a deep breath, lips are tightly sealed around that mouthpiece and then you do a forceful exhalation.

You want to blow out about twice as fast as normal, but not as hard as you possibly can. So again, not your maximal effort. After you’ve done your final breath, you’re gonna do 10 and after that final breath, you’re gonna cough to clear the secretions. half if you need to do a little bit more clearing and there are contraindications with as well pneumothorax hemoptysis is the coughing up of blood or bloody sputum, you certainly don’t want to aggravate that. If you have acute dyspnea, shortness of breath, severe nausea or increased intracranial pressure, probably not a good idea to do this tool. So
again, they’re going to look at this in the hospital and then decide if it’s appropriate and my patients will come home with the acapella flutter valve. Now what happens with this is again, there’s back pressure behind that mucus, and it loosens the secretion so you can call them up. It’s supposed to pop the alveoli open. So that can prevent or treat the collapsed lung or the closure of the lung. The alveoli sometimes don’t inflate, or if they do, it’s reduced. Or you also have the absent or reduce gas exchange. Now there’s two versions of the acapella we have the blue version which is the easy easiest.

This is for the individual that can’t generate an expiratory flow of more than 15 liters per minute maximum speed of exploration is measured in liters per minute. So the individual who needs this can’t do 15 they’re doing less. When we go to the green, this is more difficult. So this is for the individual that can generate and exploratory flow greater than 15 liters per minute. Now sometimes the patients will come home and they’ll call this the pickle. So you may hear about the pickle rather than the acapella vowels.

The other one again, I don’t have permission to share you the image is the RC-Cornet. Now they say that this one is appropriate for children as young as two and a half. And then anybody that’s older than that, so it’s going to facilitate your airway clearance. You’re going to have that positive exhalation pressure that widens the airways helps reduce your respiratory distress, mobilizes the mucus, and then you can cleanse the airway. With this, you have two settings. And there’s four different levels of resistance. So setting one is going to enlarge the airway, promote ventilation, and then you move to setting two and that is the setting that frees the airways from the mucus. So their protocol is three times a day, two minutes per setting. Patients are gonna come back from the hospital with this, I’m not involved in this training. Okay, now, when we’re looking at respiratory muscle weakness, there’s ways we can identify it and if you were apart when we talked about OT, PT can also benefit by having their patients use respiratory muscle strength training. So different ways that we can assess is this
actually present, we can certainly look at their breathing pattern, look at shortness of breath, we can assess their cognitive level. We can look at the Borg scale, this is a scale of dyspnea. We can measure your shortness of breath, we will look at ventilatory response index, your maximum termination time. If you're a physical therapist, you could do something called a timed up and go which is nicknamed the tug test. And then we can look at their swallow function voice quality and we can monitor their vitals. So a lot of different ways we can assess when we're looking at cognition we mentioned in part one, there are studies that have shown we can increase cognitive function after respiratory muscle training.

But you need to know what your baseline is. And they believe that it is not uncommon for patients to have an exacerbation of cognitive deficits when their oxygenation is compromised. So they have There is a link between respiration, cognitive function, and oxygenation. So again, you're going to do your baseline testing, and then you can assess after you're done with your respiratory muscle training, occupational therapists could use something called the Allen Cognitive Diagnostic Module. And there's 35 different assessments of functional cognition I and what they have determined in this particular training for respiratory muscle strength training, they feel that there is no cognitive level where you could not do respiratory muscle strength training. Now again, sometimes you're going to need some cues along the way, it may not be something they can do independently, but it's possible.

With the dyspnea scales, we're looking at shortness of breath during exercise or tasks. So the Borg scale is rating of perceived exertion and this goes from six to 20, six is considered no exertion at all. This was just easy peasy. And then 20, this was really, really hard. This is the maximum amount of exertion I can possibly give. So the patient is going to give you a number that corresponds to what they feel their level of exertion is during physical activity, there is a modified scale much easier, it’s zero through 10. If you're looking at ventilatory response index, you're going to have your client count to
15. we’d like them to do that in eight seconds and in one breath. Now the more breaths it takes them, the more compromised their respiratory system is. You can also do maximum foundation time. This is the longest period that the patient can sustain a vow. So that prolongation usually we’re saying a, and we’re holding it if you've done the fringe a I there's always that exercise where we’re looking at can you prolong a for how long and then we rate it. So, we do have the scales, you know what is male versus female for the various vowels you can take a look at in use for the tug test, patient is going to walk 10 feet. So you're going to tell them when I tell you, I want you to get up out of the chair, use whatever assistive device you use for ambulation. You’re going to walk to a line that's 10 feet away from the chair, turn and come back and sit down. So what we're looking at in this tug test is their pace. Do they have any balance loss is they’re shuffling?

Are they studying themselves on the wall? They’re not using their device properly. You know, what’s their breathing pattern like? Are they in a real hurry to get back and sit down before they run out of air? What they found is an older adult who takes more than 10 I'm sorry, 12 seconds to to complete So there are studies out there that talk about decreasing the risk of falling just through respiratory muscle strength training because it stabilizes the core and it helps with their endurance. Now when we get into the swallow and we do have a list of assessments that we're going to put up for you to take a look at. So when we're looking at the bedside evaluation, there is a number of assessments that we can use.

One would be the safe and that is swallowing ability and function evaluation. We can use the mann assessment as swallowing ability which is nicknamed The Masa. You can use the bed which is the bedside evaluation of dysphasia and there is another one called mannaQure and this is an English to Spanish assessment of dysphagia and dysarthria, so any of those will give you a good indication about the patient’s swallow function. We’re also going to look at their breathing during swallowing. Can they
swallow before they have to take the next breath and what we see with a lot of our COPD errs, they are just the hovers in the puffers, and that's all they can do to swallow during that APNIC pause. Did they have a protective cough? Can they produce a protective cough when they need it? And what is their endurance for that meal? We know there's a lot of our individuals out there that is so compromised with their respiration, and just their overall fatigue, that they really need five to six small meals, they can't consume all of their calories in three meals a day. So that's a strategy that a lot of facilities really hate to hear is that five to six small meals, but you know, they just don't have the endurance to eat three large ones. We can also look at the voice so what's the voice quality?

What is their respiratory function when they're speaking? Sometimes we're going to see increased laryngeal tension because they're overcompensating for that reduced power. That reduced breast support. Are they speaking on residual air? Sometimes you'll see the voice fade as the day progresses. And you'll have that individual that even with light activity, it's all they can do to speak. I just had a gentleman with COPD had a horrible exacerbation, and he could barely get out one word per breath. I mean, that was just really horrific.

So we're going to see some issues there. Now, what I would recommend that you consider if you're going to do Respiratory Muscle Strength Training is invest in a peak flow meter. And we do have the name of a peak flow meter that should be coming up in the notes. The one I like is called Smart one. I don't have permission to show the image to you. But you can take a look at it on YouTube. So you're going to type in smart one peak flow meter. And there is a YouTube video on how to do this. So with the peak flow meter, you're going to inhale and then blow out as hard and fast as possible. And you're going to do it three times to get a reading. Now with this smart one peak flow meter, you have an app on your phone. So you're going to type in your patient's age and height and weight. And it's going to calculate what is the target value
that we'd like this person to be at? And then it's going to show us where they stand, how do they compare with their performance on those three exhalations. So gives you a way to track and document you know that they are not at their target levels. So it's one way to assess now with this smart one, every patient is going to have their own cardboard mouthpiece. So that's relatively inexpensive, but it allows you to check throughout the course of therapy periodically, you may want to do it every session. I don't do every session, but you have that potential to do it, but it's a good way to assess where are we starting.

You make sure your patient can do the diaphragmatic breathing. We need to have efficient breathing. So sometimes the best way for our patients to learn how to do this is to be in a reclining position head in the bed elevated about 30 to 40 degrees, and they're going to breathe through the nose and then exhale through the purse lips, and they're going to have their hand on their abdomen so they can feel and watch it rise and lower during the breathing process. diaphragmatic breathing is very efficient. So this is something that we want them to have in place and know how to do before we get to the respiratory muscle strength training portion. Now one thing to keep in mind is to always take a look at your patient.

I have some patients that I would really like to do respiratory muscle strength training with, but they are extremely weak. And the tools are, I mean, they're not outrageously expensive, but it is an investment. So whether I'm providing it or the facility is providing it or the patient is providing the tool, it's money. And I find that if my patients can't do this, the first time around, that tool is gonna go in a drawer and we're never going to see it again. So maybe I wanna try something that's a little bit easier before we go into using a tool that's going to cost a little bit of money. So what I found was some of the patients they have very weak lip seal, they don't have lip strength. So even if they were able to blow they're losing all that air because the lips aren't tightly sealed, or they don't even have the breast support to blow very hard. So I like to use the dollar store
flutes or the dollar store harmonica. Now you can go to talk tools they have the horn protocol, I believe horn number one and maybe number three is a harmonica. Those are relatively inexpensive. So if they can't do that dollar store flute or that little tour harmonica, they're not gonna do well with the EMST, IMST and the breather. So I need to start with baby steps. Let’s do the dollar store flute the little harmonica and then work our way up. Let’s fix that lip seal get that lip strength get that error being directed through the horn. Even if they can't toot the horn you can hear that restroom coming through the horn and then maybe we can go to the tool. So with diaphragmatic breathing, what you'll often see with your patients is they are not doing that they are raising the chest and the shoulders.

They're over doing a lot of cool vehicular breathing, well, that takes a lot more energy and it's not efficient. And when we're tense, that's usually what we revert to. So you have a person that's extremely short of breath, they automatically go into that posture. So it's kind of a vicious cycle, that makes it even worse, and they get very anxious. So the more they have that diaphragmatic breathing down, the better is going to be that's when you get the most oxygen with the least amount of effort. So really important, they know how to do that.

Now with respiratory training, depending on the tool that you use, the protocol may be just a little bit different, but generally speaking, they want you to do this on a very regular basis, usually for at least three weeks before you see any significant effect. Now when we take a look at the tools, we're getting I'm gonna be looking at, you know, five weeks, six weeks sometimes and then you do a maintenance plan. So we don’t lose the benefits. We want the training intensity to be moderate to high 50 to 70% of your maximal inspiratory or expiratory pressure. And there's ways you measure that on the tool. Typically, they're going to ask you to do the training one to two times a day, anywhere from five days a week to six days a week. Again, it depends on the tool. Now, there was an online chat. It was a chat done by Usher May of 2019. Dr. Harrison
Jones, who is an SLP and Renae I hope I’m saying her name right key orcas. She’s a respiratory care practitioner, they were talking about respiratory muscle strength training and the subject came up about children. The our general thoughts were, this would be appropriate around age five and the child needs To be able to follow commands. But again, when we take a look at the tools that are out there, when you look at their website or their literature and if you have a hard time finding that you know, call or email their support, they will give you their thoughts on how young you can use the tool with.

If you have a really young child, you may want to do the top tools scoring protocol because we started out with something that's easy to blow and then it gets a little bit harder. So I would always investigate with the manufacturer of the device, but generally speaking, they were suggesting age five and able to follow commands. It is not unusual for your client to become lightheaded when they're doing respiratory muscle training, if they have to adjust to that increased oxygen and carbon dioxide exchange and that lightheadedness is going to ease off. If it doesn't, then you really need to talk to the physician.

But when you are experiencing that light hand headedness, you just need to take a break, breathe normally. And then you can come back and finish your protocol or your give yourself a little bit longer timeframe as far as a break and then come back. When I’m working with my home health patients, I don't want them sitting on a bar stool in the kitchen because again, this lightheadedness, they may not tell me, but then we've got a problem. So I like them to be in a chair that provides the support, the back support and on the sides. Sometimes they need to be supervised by their caregiver or their family, their spouse, because again, they may not remember cognitively I just can't jump up out of this chair and move. So they need somebody to help just kind of supervise and remember the rules. Coughing with respiratory muscle training. Well, you might find that you have that workforce, you're working against resistance while you're
exhaling. So it's great for the airway clearance. So they don't want you to suppress the cost. When that cough comes you remove the tool, you finish your coughing and expel any secretions rather than swallow and then you can continue with your respiratory muscle training. Now this is the breather. It was the first respiratory muscle training device. Peck Nicholson invented it and the company took on her initials, so PN medical, this is a handheld tool. They redesigned it just a couple years ago and it does both inspiratory and expiratory muscle strength training. When we are looking at the training, there is resistance. On each side we have a dial so you can change the resistance level. It strengthens the respiratory muscles, it gives the muscles a workload and they become stronger.

So when we take a look at the dials, we have an inhalation side exhalation and the good view of the mouthpiece. When we're looking at the breather again, there are times you just wanna check with the doctor. These are things you want to make sure it's okay. You know, they're not quite saying contraindications, but careful evaluation, if your patient has any of these particular health issues, and sometimes we may not be aware of these. So my recommendations would be if you have any concerns, I would recommend as your protocol that you make it your protocol and procedure that you contact the physician, their primary care physician or if they're being followed by a pulmonologist. I like to fax them, I send them the information on whatever tool I'm planning to use.

Let them know I was considering using respiratory muscle strength training. This is the tool. And would you clear this patient for this particular modality? If they think this is a bad idea, they're certainly going to communicate that. But I would like to have that doctor say not a problem. So fax the information on the device, what you would like to do and have the doctor give his okay, if he doesn’t, you’ve just saved yourself a lot of grief and the patient. So when we’re looking at the protocol, I on the inhale settings, let's see if we can get that arrow there it is. We have a dial that goes one through six,
and our exhale, settings. The dial goes one through five, a little bit of a glare on the settings there. I apologize for that picture. When I'm doing my training, whichever tool I'm using, I like to do Pulse ox. I like to look at the oxygen saturation right pulse rate before and after I've used the device. So what are the readings before we've done it? What are the readings after, so I have a record of every session and can see if there's any issues. Now with the breather, the numbers don't have to match on both sides, they're independent. you rotate the dials to whatever setting works. You want to be able to manage 10 breaths without puffing your cheeks and becoming short of breath. You wanna make sure that you're feeling like you're giving 70% effort to get to that 10th breath.

They recommend their protocol is six days a week, two sessions a day, morning and evening, excuse me, and you do two sets of 10 full breaths each session. Now on their website, they have a session log a daily journal, they have a summarized protocol of the whole procedure. The whole training and how to clean it. So you're able to download all of that. They have training videos so you can demonstrate it for the clients by you doing your own. Or we can sit and look at the training video together. When you're going to increase the resistance, you know, if you think this is too easy, we need to bump it up to the next level and try and this is where your clinical judgment comes into play.

When I'm increasing their levels, I will look at inhalation first, I will take their Pulse ox, I'll take up the inhalation setting by one, we'll do our breathing. And then I'll do their Pulse ox again. If it isn't looking good, I'm going to take it back to the setting that we started with. Same thing with exhalation, increase it by one Do the breathing, do their Pulse ox and see. So you need to use your clinical judgment. Is this a good time? Or is this too difficult for them? They do say that you are able to use the breather with individuals who have a trake. So it’s a great way to work towards the passing your or even the events will remove all of the trake. The nice thing about the breather is they
suggest you can use it to help that patient when they become anxious when they’re short of breath. So they call it the calming intervention. We know the shortness of breath increases tension, they tend to move into that Karlovic killer breathing and that's just a you know there's a cycle. So take down the dials to the lowest settings. So you go back to setting one on inhalation and exhalation. So we're at the easiest level and they do just relaxed breathing. Now the nice thing about the breather because we have the dials with the numbers and you've done your training log, you know exactly how to take your breather back up to the settings for inhalation and exhalation there's no guesswork, but you can take it down to setting one and do that calming intervention. Now, if you want to increase the resistance, or your professional athlete, professional voice user, they have a breather that is harder and they call this the breather fit. And this strengthens the diaphragmatic muscles.

So it is an option for the individual who is healthy professional athlete that wants to maximize their performance. Now the EMST 150, let's get our arrow again. Okay, this blue tool, this is the EMST 150 this is what they start Started out with and they recently just came out with the EMST 75 light, it is not as hard as the EMST 150. They also came out with the IMST adapter. So this is something that's separate, you snap it onto your EMST 150. And it works on inspiratory. So where the breather does both inspiratory and expiratory without any attachments, the EMST you can get an adapter and turn it into the IMST as well.

They are they do have a lot of information on their website training videos frequently asked questions. They have an RMS teach training guide, client forms in their library and they do courses specifically on early intervention rehab prevent and treat patients so you know that's another option is the use of the EMST. Whichever one you use the 150 or the 75 light, this is a calibrated device, there is a spring in that valve, and we can adjust that. So the valve blocks the flow of the air until you have enough pressure to kind of break through that valve. If you don’t have enough force, the valve won’t
open. So again, this is something that if you have a weak patient, they may not be able to do the 150. They might need the 75 light or you may need to start with the baby steps. You know the dollar store flutes, or horn, or harmonica, and then seeing what happens as they progress. You can adjust the pressure amount and you want to work at 75% of their maximum expiratory pressure and every week you're going to increase the resistance with this. As with all of the tools that we've talked about, check with the physician before using, if we have these particular issues, again, just as a regular protocol, you may just want to, as a rule of thumb, contact the physician. Yeah, this is what I plan to do any concerns, can you clear the patient for this?

A little bit hard to see on this view, but there are numbers and there is a metal screw right here. And you want that metal screw to be your guide, you know, as far as what the setting is. So if you turn the knob clockwise, it's going to tighten this spring and it's going to be more difficult. If you turn it counterclockwise, it's going to make it easier. So we figure out in our first session, you know what our levels need to be. So we need to find your maximum expiratory strength so you're going to take that metal screw and turn it lines up with the number three. And a little hard to see, but there's a number 30 and it goes all the way down.

That tells you the resistance level. So you have that metal screw with 30, you're going to take a deep breath in, put the mouthpiece in your mouth and you're going to blow quickly through the device until the air stops. If that was too easy, we turn the knob clockwise one full turn so completely around and do it again. If you can't move the air through, you have to turn it back, one quarter turn, and you continue to turn it back until you can move the air through. They consider that setting your maximum pressure and you train that first week at one quarter turn below that maximum pressure. So we need to find it and then the first week we train at that level. Their protocol is we have five sets of five breaths. So you're doing 25 training breaths, they are very clear that you need to rest for at least 15 to 30 seconds between breaths again, this is going to
help with your lightheadedness. My patients like to do things fast. And this is not one that you do fast. After you do five, that's a set, you wait one minute, so literally, sometimes they have to have a timer on my phone, you know, to let them know you can't do it until this rings. Their protocol is five days a week, and you rest two days and we do this over the course of five weeks. So every week, you're going to turn that knob a quarter turn and train. At five weeks, you're going to do a maintenance plan. So we're looking at three days a week 25 breaths. So again, the same protocol, five sets of five breaths. Some people like to do it a little bit More than three days a week, but definitely we don't wanna go below three. With the EMST 75 light brand new product, it's a lower threshold.

So this is for the person that could not tolerate the EMST 150. We're going to train with this. Once you reach that 75, which is the last setting on the tool, then you can move to the EMST 150. So it's kind of the baby steps to get you to the harder. Same thing, you're going to turn that screw to the numbers, you're going to turn it counterclockwise until you can't turn it anymore. You'll take that deep breath in, put the mouthpiece in your mouth, you're going to blow through the device until the error goes through and stops. And you follow the same protocol as we did with the 150 to find out what your maximum expiratory pressure is. And take it back one quarter turn and that's where we're going to do our training.

Now with the inspiratory adapter, we are going to use the EMST and put the adapter on. So you're going to adjust the settings on the EMST 150 you'll clamp or insert the inspiratory adapter on the tool, you're going to do a deep breath in and then push all the air out. So it's kind of priming the pump. Now you put the mouthpiece in your mouth, you inhale forcefully. And then you're going to look at how easy that was. If it was too easy. We're going to increase the settings if it was too hard, we're going to turn the knob back. So there protocol pretty much the same as it was just for the EMST itself. We do the five sets, five breaths, 25 training breaths, five days on, and
then two days rest. We do the maintenance plan. And we’re always going to use that silver screw on The EMST as our guide for our settings. Now what I have found with my patients who have done the EMST, when they clean the tool, they screw up the settings. So it’s just really hard to figure out where we were sometimes without silver screw. Now some of our patients may want to do a little bit of practice on the expiratory muscles before they eat. So there has been the suggestion that you may want to do two sets of five breaths before the meal that works on the expiratory muscles. But you also need to do the inspiration to draw the air in first. So sometimes we have to do inspiration and exhalation to get that cough going.

But it may give us that practice, kind of priming the pump again for an efficient, effective cost. If we do have something that we need to cough and clear. Really important that we monitor. You know, I always like to do the pulse ox before we start respiratory muscle training in the session and then after. And also anytime that we're adjusting the settings, so I’ve got a record, we also need to make sure that the patient knows how to clean the device. If they aren’t cleaning this device in months, it’s going to be pretty ugly inside. Sometimes you can get some excess water in it and both companies talk about how to troubleshoot, you know with the cleaning. And remember that devices patient specific, helpful if you have one to demonstrate, and then the patient can follow through with their own. Some things that you may want to look at whenever you're working with your individuals. What do you see happening with their endurance at meal time?

Do they seem to do better with consumption over the course of the meal? There able to eat more without as much difficulty, they might be able to tolerate three meals instead of the five to six small meals because they were so compromised. You know, that’s a possibility. Are you seeing a stronger cough? Are you seeing the stronger voice and there's a lot of studies out there on the Parkinson's patients showing the impact on the voice. Are you seeing a better coordination of breathing and swallowing. The
other thing that they've looked at is respiratory muscle strength training has actually shown to improve the levels or the score on the penetration aspiration scale that you might use in your swallow studies. So you may see that there's a change in those numbers which will be wonderful for your clients. We need to do some discharge planning, again, we want them to do that functional maintenance plan so we can call it a lot of different names, home exercise program or plan restorative nursing can get involved and give them the encouragement and the supervision to follow through functional maintenance plan, caregiver staff education, we want them to maintain the skills that they've learned over the course of their time in therapy with us with this device. In restorative nursing, again, they may need that person there just to make sure they're following the protocol.

There are templates that you can find on the various websites to help you put that together. You can do group or concurrent therapy group, you're looking at anywhere from two to six patients at one time doing the same or similar activities. Concurrent you have two patients at one time they're doing different activities. But we don't want that to be more than 25% of their total treatment minutes. And what they found is, as is with a number of different therapeutic techniques patients benefit from the support they get from the group.

The individuals kind of pushing them you can do it you can do it, so we can do respiratory muscle strength training, I group or concurrent. In Home Health, I, there's great outcomes. I am part one we talked about some home health organizations saw the benefits of this from every discipline. So they purchase the tools because PT OT speech can use it. It's not just a one discipline thing, I if you do Respiratory Muscle Strength Training, they found that actually decreases the risk of re-hospitalization. it's cost effective. When you take the cost of the tool, you're looking at how many disciplines are using it over the course of how many weeks in therapy, it's not expensive. You can show data on your Oasis, what do we see as far as the ADL and
their endurance? What do we see as far as the change in the fall risk are their behaviors, their decreased anxiety, because the shortness of breath. So we do see, in home health, a lot of individuals are hospitalized because of respiratory issues. If we can all put this tool into our practice with PT, OT and speech, we have the whole team there supporting the use of this device in this technique with our patient and we see improvements all the way around. There is one discipline that needs to take the lead as far as changing the settings however.

So putting it all in a nutshell, respiratory muscle strength training, we know it’s much more prevalent than we really ever thought it was. It certainly is a cost effective intervention and improves our patients outcomes. There’s a lot of evidence based literature out there that we have for this approach. We have documentation it does decrease the risk of re-hospitalizations.

And I every discipline can show benefit. I in the patience abilities. If we are all using rescue muscle strength training, I would recommend that again, you go to the websites of the companies that offer the products and you take a look at their training their information, use the resources, again, improve your comfort level, it's going to benefit your patients, the more comfort you have with the device, but there's certainly a lot of good information out there from both of the companies PN medical and Aspire. So I will turn it back to Emmy.

- Here I am sorry, it was just taking a moment turned on. All right, so let's go ahead and start looking at the questions. We do have quite a few. So we'll see how many we can get through and go from there.

- All right.
- [Amy] Okay, so the first one is, do you need a doctor’s order to use the valve, just like needing an order for a passing air valve?

- [Denise] For the EMST, IMS, or the breather, it is a modality you don’t need a doctor’s order. But as I said, you may be more comfortable just getting clearance from the physician, there may be something with the patient you’re not particularly aware of. And he can give you guidance. It’s a good idea or I wouldn’t try it just yet.

- [E] All right, great, thank you for clarification on that. Next question is could you review again why specifically, it is best to check with the physician prior to utilizing excuse me this device and the breather?

- [Denise] You know, I think it just depends on your comfort level. If you have any concerns, you’re not sure especially starting out, you may feel more comfortable just having the doctor clear your patient. I only do that in certain circumstances. As I said, there may be some things in the patient’s medical history that they haven’t told you. You know, patients are like that. You may not have all the information. So I think it just depends on your comfort level, you know? What do you think about this particular patient? If you really feel I really want that doctor to say it’s okay. You know, I will go ahead and just get his clearance, you know, just clarified any problems with me trying this or is there a health issue that I’m not aware of?

- [Amy] Great, thank you. Do patients ever have problems with ear popping during forcible exhalation?

- [Denise] I haven’t had my patients complain about that. Again, one of the things they mentioned if there was any middle ear pathology, this may not be a good idea. So if they are complaining about that, you may wanna check with their physician. I’ve never
had that happen. But again, you can always contact whatever companies device you’re using for their guidance as well.

- [Amy] Okay, where can you purchase the 75 light? [Denise] You can get that from a spire that is the company that manufactures the EMST. If you Google EMST 150 you should get to the Aspire website. I’ve had some problems when they’re just type in a spire I don’t quite get there. You can also get them at Amazon and some of the other medical supply catalogs. If you go to the company themselves, they may have a deal for bulk purchases. So again, they can give you an estimate if you wanted to purchase more than one , there may be a package deal.

- [Amy] Perfect, thank you. Okay, for the five days on two days off, should the two rest days be consecutive or spaced apart?

- [Denise] My patients usually do the weekend off. So you know, I would recommend the five days consistent and then the two days rest, before we start again. Okay, and then for reflux, would you use IMST, EMST or both?

- [Denise] I think you need to look at the overall issues with your patients and both of the companies have guidance for what particular combination you need, you know, with the breather. Yeah, they have a lot of information out there on using that with the reflux patients. So, you know, with the breather, I would do both inspiratory and expiratory. But if you’re going with the EMST, do you just want to buy the one tool or do you need the adapter? And they can give you some guidelines from their perspective with their device, which they think.

- [Amy] Okay All right, moving on for VCD, do you ever see exacerbation from IMS or EMST and which would you use? I have not seen that. Most of my patients that I’ve been using it with have COPD, Parkinson’s, more than a vocal fold pathology.
- [Amy] Okay, do any insurance companies pay for the devices?

- [Denise] I have not found that to be the case.

- [Amy] Okay, which is unfortunate.

- [Denise] I know.

- [Amy] Is there a list of therapists that are trained in this area and oh in the Sacramento area, would you know that?

- [Denise] I don't know on either website if they have a list of train providers, but you can contact the company they may have a list of people who have gone through their certification, their CEO courses that they can refer you to.

- [Amy] Okay, That's good information. Moving along, we have just a few more left if you're able to stick around with us great. If you do need to log off, we have reached the hour mark. So please feel free to do so. Let's move on to the next question. I work with a young girl nine years old, who has multiple health issues, including an audible voice. Do you have any suggestions for using RMT for someone like that? Where would I begin?

- [Denise] What I would try. I would try with like the dollar store flute or the harmonica just to see you know what kind of breath support she has. If she has good lip seal around those very inexpensive devices, you may want to try the EMST 75 light because that's not as difficult as the EMST 150. Now, the breather, you could do setting one, but you know I may want to just start with the dollar store flute or
harmonica and see what her breast support is like before we invest in something that’s just a little bit more expensive. Have the mic getting stuck in a drawer?

- [Amy] Great, good advice. Do you think healthy individuals could benefit from using the breather fit to decrease age related respiratory issues?

- [Denise] Breather fit tends to be more for the professional athletes but there’s no reason you couldn’t use the breather or the EMST IMST effect, they’re suggesting healthy individuals. This is good just to kind of slow down any aging issues.

- [Amy] Okay, great, two more. Are there any devices which use nasal breathing instead of mouth breathing?

- [Denise] Everything I’ve seen is a mouthpiece for inhalation and then the exhalation.

- [Amy] Okay, and then can you please again explain the main difference between the acapella devices versus the EMST device.

- [Denise] the EMST is not oscillation. It doesn’t have the oscillatory function. It is for the respiratory muscle strength trainer where the acapella is to clear the mucus.

- [Amy] Okay, perfect. All right, we managed to get through all the questions today, which is awesome. All right, so I guess we'll go ahead and wrap it up there. Thank you so much, Denise.

- [Denise] Thank you. [Amy] I know I say this all the time, but it’s always a pleasure to have you with us. We always learn so much, and we really appreciate your time.

- [Denise] Have a great time, thank you.
- [Amy] Great and thanks to all of our participants for joining us today. We appreciate your time as well and all of your great follow up questions. So I hope you have a great rest of the day. Thank you, everyone.

- [Denise] Bye.