ALS in Acute Care:
Taking the Fear Out of Hospitalizations
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- [Moderator] It is my pleasure to welcome and to introduce Dr. Jennifer Liu to physicaltherapy.com. Dr. Lou is a practicing physical therapist and a Board Certified Neurologic Clinical Specialist. She earned her Bachelor's of Science and exercise biology and A minor in psychology from the University of California Davis and her doctorate in physical therapy from Samuel Merritt University. Her clinical experience includes work in both acute care as well as outpatient settings. She's also a former adjunct instructor for Samuel Merritt University. Currently, she works at Kaiser Permanente in Sacramento working with patients with neurodegenerative and neuromuscular conditions. And it's also the physical therapist in the Multidisciplinary ALS Clinic. So at this time, I'm gonna turn the microphone over to you Dr. Liu, and thank you so much for being part of our Virtual Conference Week.

- [Jennifer] All right, thank you. Thanks for having me. I apologize in advance, I'm a little bit sick. So I'm gonna try not to cough into the microphone too many times. But if you guys can't hear me or understand me, just let me know. Let's go ahead and get started. Alright, so we already went over about me. I went too far. So we'll just talk a little bit about what ALS is, the role of physical therapy, kind of as a whole, but also as it pertains to acute care in particular, who all needs to be considered as part of the multidisciplinary team, ways that you can decrease the stress and anxiety about being in the hospital, look for the patient and the clinician, ALS I know can be a scary diagnosis, but also being in hospital can also be terrifying. And then just a couple case studies at the end and then we'll have time for questions as well. And we'll go over the learning outcomes. So, after the course today you should be able to identify at least five symptoms that patients with ALS would present with, you should be able to identify the role of physical therapy, you should be able to just let, sorry. Okay, list at least four activities and appropriate levels to, or ways to appropriately prescribed exercise for patients with ALS, ways to decrease the stress and anxiety like we talked about, and also be able to list the members of the ALS team. Okay, so let's talk about a little bit about what ALS is in general. So, ALS stands for Amyotrophic Lateral Sclerosis. It's also known as Lou Gehrig's Disease. It's gotten a lot of publicity in the last few years with the Ice Bucket Challenge, which is raising money for research. But ALS is a neurodegenerative disease, that affects the motor neurons. And it's actually pretty rare still, but it is the most common motor neuron disease. And it is considered a clinical diagnosis, meaning that there's not like one test in particular, or one lab work that will lead to the diagnosis of ALS. Typically, with the neurologists would make the diagnosis, they are looking for mixed upper motor neuron and lower motor neuron signs. So they are looking at areas that from the cerebral cortex, the medulla and the anterior horn, and it's kind of one of the... It's a main thing that, makes ALS now is that it's both upper and lower motor neuron. So if you see these patients, maybe before they even seen in a Rolla, just put your like, oh, this isn't really, seeming clear cut as being a back injury or a head injury. This might be a diagnosis that you might consider. So, in addition to looking for those mixed upper motor neuron and lower motor neuron signs, the neurologist would also like to do an EMG or nerve conduction study to kind of confirm the diagnosis based on the results that they get. They would also do labs and MRI, Brain and Spine imaging to look for other things.

So between the nerve conduction study, the EMG, the labs MRI, they're looking at things like infections that can cause pretty significant weakness, vitamin deficiency, especially vitamin B deficiency, can cause some nerve damage. Things like back injuries can cause either nerve compression or spinal cord compression itself and then I was looking for things like carpal tunnel or other nerve conditions that, might kind of also get missed. Then they're also looking for things, that maybe don't fit in one specific diagnosis I guess, that they can also rule out with these tests. But they usually want you to see a neuromuscular specialist as a specific type of neurologist. Looking at the overall incidence and prevalence, 90-95% of the ALS cases are sporadic, only five to 10% are familial. They don't do a lot of genetic testing if there's no family history of ALS, just because it is extra stress on the patient and takes extra time and resources. And because familial link is so low, however, it does affect if you're able to participate in Social Clinical Trials. So if you're looking at doing clinical trials, they might do the genetic testing, so that you qualify in one way or another. There's about 16,500 Americans that have ALS, was 6,000 new diagnoses each year. And then the life expectancy is not long, it's generally two to five years. It does take quite a while to get diagnosed oftentimes because they are looking at things like, back injuries as a cervical riddick? Is it a lumbar riddick? Do they have an infection? Is it just old age or posture changes? So it can take patients oftentimes, in 10 to 17 months to get diagnosed, which if your life expectancy is only two years, seems like a very long time, and it also makes it seem like the disease progressing very, very quickly.

And then it usually occurs or usually the onset of it usually occurs between 4O and 70 years of age, I have had patients in their 30s. I've had patients in their late 80s that get diagnosed so doesn't really discriminate, but usually kind of in those in that time frame is when most people get diagnosed and as affects more men than women, for whatever reason. And then it is important to know that veterans are more likely to get ALS and the general population, and it's probably related to all the chemicals that they're exposed to. The VA is a fantastic resource for your patients. The VA does cover equipment, services, work up, and they cover it significantly better than most private insurances or health systems. They will do the electric wheelchairs right away. Sometimes they even help with home modifications. So if you know that your patient is a veteran try to get them establish with the VA, as soon as possible will be their best bet. Okay, let's go back. Okay, so let's look at the clinical presentation. So generally speaking, ALS is kind of a scale. So there's upper motor neuron signs and lower motor neuron signs and the kind of mix of signs, can kind of vary, kind of up and down based on the patient, so there is no really any one specific als presentation. So the lower motor neuron signs are typically for circulations. Which are like little muscle twitches that happened in the muscles, they're visible to the naked eye. They can happen in basically anywhere, really common in your arms and your legs. Patients will get them throughout their trunk. They will get them on their tongue, which is one of the easiest ways to spot ALS. muscle cramping, again can happen anywhere. Oftentimes just have happened to their hands and their feet and thighs. And then the muscle atrophy, and then if the pattern of it tends to be asymmetric. And it does usually come with very

significant weakness. If the weakness is coming from the lower motor neuron signs. A lot of times that atrophy will come, specifically like in their hands, so you will see a lot of thinner atrophy in these patients. The upper motor neuron signs include Spasticity, Hyperekplexia, they'll get a positive Babinski, Hoffman, Clonus test. The Clonus might just be a couple beats but it can also be sustained. The weakness that comes from the upper motor neuron symptoms is not as significant as the lower motor neuron. So, if the patient is more upper motor neuron heavy, their weakness may not be as noticeable or as drastic. And then also emotional lability is very common with the upper motor neuron predominant presentation. You will also see significant truncal weakness, head drop me in that there had just falls forward, Frontotemporal Dementia which we'll talk a little bit about, pseudobulbar symptoms, shortness of breath with exertion, orthopnea which shortness of breath with laying down and weight loss. So if you're looking at these presentation or these clinical signs, you can see how it could be difficult to diagnose a patient with ALS. So, truncal weakness and head drop. Is it something like ALS? Is it a spinal injury? Is it poor posture, we all sit with this forehead for shoulder posture, especially as people get older and they have scoliosis, psychosis that does affect their trunk. In general, the Frontotemporal Dementia, which we'll talk about can also, are they just getting other types of dementia or they having stroke like symptoms.

Those are also things that need to be ruled out. Shortness of breath often can be deconditioning, can be pneumonia could be other lung diseases, heart disease, orthopnea, do they have destructive sleep orthopnea? Weight loss is that related to special diets? There's a lot of really trendy diets, now that people are going on to lose weight really fast. Is the weight loss intentional? Is it an accident, or cancers also, will result in a lot of weight loss. So those are things that also needs to be rolled out. So we're looking at these different kind of presentations. It can be really hard to pick out yes, this is ALS and so it can take a long time, for a patient to get to the right condition to get the right diagnosis. Frontotemporal dementia is something that affects 15% of patients with ALS. However, they estimate that about 50% of patients with ALS may have cognitive impairment in some way, which is different than what it was typically thought of ALS. There's a lot of literature that's still out there that says ALS does not affect your brain, does not affect your cognition, I still get several patients that are like, well, I can't possibly have ALS, because I'm having memory issues and they can't be related. But definitely they're finding a link between the cognition and the cognitive changes and ALS. Sometimes the cognitive changes might even proceed the ALS diagnosis. But frontotemporal dementia in particular, does affect your executive function, language, judgment, behavior, personality. So sometimes people will become more apathetic, they just don't really care what's happening. A lot of them don't recognize their impairments, they don't realize that they're having trouble walking or talking they still think is on drive. And so it really becomes a big safety issue. These patients do need generally 24 hours supervision or assistance at some points. Okay, so this can be a huge Part of the diagnosis that does, change the prognosis a little bit. Okay, Pseudobulbar Symptoms, are things that maybe the general population doesn't really know about. It's not something that comes up with a lot of other medical

diagnoses. And so it's kind of hard to explain to patients. Pseudobulbar Symptoms, it's kind of uncontrolled laughing and crying that's kind of inappropriate. So, it happens a lot of times with, like they'll be doing their swallows exam with the speech therapist, and then also they'll start laughing, which is a big safety issue because they could start choking as well. Patients will laugh during sad moments, they might go from laughing to crying within a split second, happens all the time when I see them at Elas Clinic and we may not even be talking about anything clinically. We could just be talking about what they're having for dinner and all of a sudden they start crying. So it is something that happens it is mixed patients very self-conscious when they're out in the public. So it is something to kind of keep in mind. Okay. And then also with ALS there's definitely a scale like I talked about. But usually, if we're talking about the different types of ALS. People will have more of a predominant limb onset type or a bulbar onset type. The limb onset, generally is weakness and arms and legs. So they will have ankle weakness, which presents as foot drop, and again, a lot of those patients will get them and the doctor says that they have a lumbar radiculopathy or will just get them for like an AFO consult in the outpatient setting. A lot of times the, ankle weakness isn't even something that the doctor picks up on if they don't actually get them up and moving during their clinical exam. The hand weakness and this coordination oftentimes gets misdiagnosed as like a carpal tunnel syndrome.

But again, like we talked about earlier, they will have pretty significant hand weakness and atrophy. There will be a lot of trouble with the walking in the falls, catching their feet on things that they are having foot drop, sometimes their knee buckles. They just get tired very quickly with standing and walking exercise or activities. And you will notice that they have physical issues mostly in their arms and legs. You'll see a lot of times in their fore arms, especially if they're wearing short sleeves, and you can see and they'll just be there at rest. The bulbar onset affects more than region of like the mouth and the neck. So we're talking about things like dysarthria or trouble talking, dysphagia, trouble swallowing. They may not tell you that, they're having trouble swallowing. It's not as obvious as trouble talking and with sialorrhea their speech might be slurred, it might be spastic. They will have like a hypernasality kind of tone to it. And so it's really noticeable. The dysplasia, especially in the early stages may not be noticeable unless they drink water in your presence. But I do tend to ask them about the dysphagia, especially if they're having some of these other symptoms and maybe the diagnosis isn't clear. Sialorrhea is excess saliva. So those patients have trouble with, managing their secretions, a lot of drooling, especially if they're having head drop, the pulse sore changes tends to make the mouth stay open, plus gravity and then the saliva just kind of pours out, which again, makes it hard for patients in social situations. Malnutrition and weight loss. ALS in general is a very high energy consuming diagnosis. So just having ALS on its own, makes you burn calories quickly. And now you combine that with having trouble with swallowing. The malnutrition is really something that needs to be addressed. But it's something that, sometimes gets overlooked. Especially when patients go into their doctor and that's a new doctor. The doctor doesn't know how thin they were before. So sometimes if the patients don't bring it up or the family doesn't bring it up. It does get missed, but it's not uncommon,

that patients will lose, 20, 30, 40 pounds in a couple of months without trying. And then the last thing that goes with the bulbar symptoms would be tongue fasciculations. They get upset, small little muscle twitching. It looks kind of like a bag of worms, that you will notice on their tongue, and they might also have some tongue atrophy at that point. Okay, ALS-Plus Syndrome is not something that gets talked about a lot. We're not gonna go over it much today. But I just want you to know that it is something that's out there, that's getting more research and recognition of people with ALS-Plus Syndrome have the typical ALS presentation that we've talked about. But they might also have issues with their vision on their ocular motility, they might have more cerebellar coordination issues. Extrapyramidal features, autonomic dysfunction. 'Cause a lot more kind of lightheadedness like near thinkable episodes, those kinds of things. And then it's important to note that FTD and the Pseudobulbar Symptoms can happen with just a regular ALS or the ALS-Plus Syndrome. So that can go either way. Yeah, okay.

So let's talk about the prognosis a little bit. So the prognosis with ALS is generally poor. Like we talked about the life expectancy is very short. It's generally two to five years, you do hear a lot about people, like Stephen Hawking that live for quite a long time with ALS. And that is usually because they have access to, 24 hour phenomenal care, they have technology, they have resources and they can afford that kind of work. For the average person, they don't have access to all that. And without having that level of support, financially and physically and medically. Two to five years tends to be the life expectancy for most people. However, the list on this page show the things that, kind of lead to a slightly better prognosis. So if you have more upper motor neuron predominance, the patients with more specificity even though they might have more discomfort, they do tend to live a little bit longer, limb onset ALS, tends to have less of the Pseudobulbar Symptoms or delayed onset of the Pseudobulbar Symptoms. So because they're breathing and their swallowing, generally intact for longer. Again, it's a better prognosis. Younger age, they tend to do better, stable weight, like I was saying that ALS is a very high energy demand kind of diagnosis. There's more research in the area, but generally they say that if you are a BMI is between 30 and 35, that leads to be a better prognosis for you. And then if you can maintain your weight, even after the ALS diagnosis, you tend to do better. And it's very hard because some patients might start overweight, and they still want to lose weight. And we have to try and really tell them that you need to maintain your weight, you cannot lose weight. Because it does kind of speed up the progression of the disease. Just like all neurologic conditions, or orthopedic conditions even, if you have better motor function and mobility before you're diagnosed, generally your prognosis is gonna be better, you can maintain your independence for a little bit longer. As we all know, breathing is very important to, our are living, so if you have a higher breathing capacity forced vital capacity that's also better prognosis. And then if you have a longer interval between the symptom onset and then diagnosis that's better. And the thought there is that, if the disease is not progressing so rapidly, it may take longer for the doctors to figure out what's going on. And because you don't have that clear cut, ALS presentation, and things are progressing as quickly totally to, that the overall disease progress or process

is gonna be slower. And then if you don't have some of those other ALS-Plus signs and symptoms, that tends to be better. Okay, there's a scale called the ALS-FRS-R, the ALS functional rating scale. This is the revised version. In the hospital, you probably won't do the scale but you might see it in the chart. So I just wanna go over a little bit. So the scale does indicate the prognosis for a patient and so to use a lot in outpatient settings, depending on the patient's hospitalization, they may not see a neurologist, who while they're there. So, but if you do see the scale in the chart, or if you know that they're seeing by mineralogist within that health system, you may be able to look back in the chart to see how their ALS-FRS-R scores have been changing, to see if they're rapidly declining or not. But it is a 12 items scale, you can actually test all these things. But a lot of times, we will just ask them, because the test itself, because it is 12 items, and it does look at things like breathing and speech and mobility, it can be pretty exhausting to the patient. So sometimes, if you just ask them the questions, that's good enough.

So I don't when goes over speech, and they're just looking at, do they have a normal speech process? Or do they not have any speech or are they completely an arthritic, I guess. Is your speech intelligible? A lot of times, the therapist or the family can understand the patient very well. We get pretty good, especially working in acute care, you get pretty good at understanding patients that have speech difficulties. But then again, when they go out in the public, sometimes it's a little bit harder for them to communicate, the salivation is it normal can they manage the secretions. Or do they have to have like a handkerchief or a Kleenex or something, with them at all times? Are they able to manage the secretion? Are they able to swallow it? They're choking on it even. And even looking at some of these items that they can't manage the secretions. It does tell you also like, oh, maybe we need to look at having them, meet with a speech therapist, or maybe they need a suction device or something like that. Okay, swallowing and obviously like as physical therapists, we don't necessarily test their swallow, but a lot of times, patients will eat in front of me during our sessions. And so it's a good time that you can ask them like, oh, do you always choke? Do you see a speech therapist? Anything is like that. And even if they don't eat in front of me, I still do ask them if they have any swallowing issues. So is there eating isn't normal? Are they choking on certain things? Are they already at the point where they need a feeding tube? Do they need a gastrostomy tube? Are they're doing supplemental feeds through there? Where they're getting some orally? And then they're just supplementing to get their calories through the tube, or they strictly NPO meaning everything goes to the tube. Handwriting, which may not seem like something that's really that important to rehab in general case, it doesn't grossly affect their daily function. However, it does tell you about their hand function. So can they hold the pen? Can they write or can they not hold the pen at all? That's what we're looking at there. Okay, for item five, there's two different categories. So, this depends on if they have a feeding tube or not. So if a patient has no feeding tube or if they do have a feeding tube, but they're getting more than half of their nutrition orally use item 5a, that looks at can they feed themselves and like cut their own food. Okay. If they have the feeding to that they're using for more than 50% of their intake. They use 5b just look at the gastrostomy

management. Are they able to manipulate the feeding tube on their own? Are they doing their own feeding? Is their caregiver doing it? And honestly at that point I have very few patients that need a feeding tube full time that are also doing their own two feeds, most of them will be dependent on a caregiver at that point. I have six is looking at getting dressed if you have an OT with you in the inpatient setting or the outpatient setting, that something that they might look at. I generally just asked them, if they're getting dressed, if I have time, I might have them. Show me some of their dressing but usually I just ask. So are they getting dressed on their own? And how efficient is it? They might be getting dressed on their own, but it takes them a long time. I will have patience and I guess I get dressed on my own but it takes me an hour and a half to get interest in showered, and then I'm tired and I can't do anything until noon. So, yes, they're doing it. But I would say that it's probably not very efficient. A lot of patients will switch their clothes so they will get rid of anything with buttons, which does make it a little bit more efficient. But usually when it starts to take that long then they start to ask for help, or an attendant or family member will help them, okay. And then can they turn in bed? Can they do on their own or do they need help with it also, can they manage the sheets?

Okay, so walking. Something that physical therapy does a lot of. So normal walking, for me means that, they're walking around no device. They're walking is not limited by breathing or balance or leg fatigue. They can walk around in their house just fine, they can run their errand just fine. It's not an issue. Early emulation difficulties might mean postural changes. A lot of patients with ALS stand with a posture that tends to be very kind of load they're hanging out on their hips, but their heads also hanging down. Sometimes they will be sweating their feet, but they're still up and they're walking around for the most part on their own. If they have foot drop, they might have more of a step which gait. So if they're walking, again, no device, but the quality of their walking is changed, then I'll put early emulation difficulty or they're still running their own errands, but they're starting to modify them a little bit. I'll mark them a three if they're walking with assistance, so I count that as being either I can AFO or a walker or a cane or using physical assistance from a caregiver. Nonambulatory functional movement, to me means transfers, seemed pivot transfers, and, where they can stand and they can get around, but they're not walking anywhere. And then no purposeful leg movements. So patients will, at that time were wheelchair bound, but they might be able to, like straighten out their leg on occasion, but not necessarily to do any functional transfers or emulation on their own. And then stairs, submissions don't have stairs in their house, but I'll just ask them like in the community, if you come across stairs, could you do them? Is it normal? And if they normally use the railing on the stairs, even before the ALS diagnosis, I don't necessarily count it against them. Maybe they had a knee replacement or hip replacement or just they're just cautious. I don't kind of against them, but normal to what they were doing before their diagnosis. Can they do it but they're really fatigued. Are they really pulling on that rail, right? Or can they just not do it at all? Whether its leg strength or balance or breathing, okay? These are more for the respiratory therapy but I do ask them sometimes as well. But looking at their breathing for their dyspnea and orthopnea. So dyspnea is shortness of breath

with exertion. And that exertion could be walking generally, we think walking think exercise, right? But it could be with ADLs, okay? So you don't think about like, eating maybe if you're having trouble swallowing, or even getting the food of your mouth because you have significant weakness. Eating can cause a lot of shortness of breath or fatigue. Okay. Once you start to get more shortness of breath with being still. So sitting, things really become compromised and patients will often get to a point where they need to use mechanical respiratory support. Most of the time, whether that ends up being a ventilator, with a trick or something more non invasive like a BiPAP, okay? And then orthopnea is, difficulty breathing while they're laying flat. So does it affect, their sleep at night? Those are things to look at. And then that would also look at if they need mechanical assistance. Okay, and then more about the respiratory insufficiency are they using a BiPAP? And it is important to note that patients with ALS they tend to be more CO2 retainers. So the BiPAP is the preferred. It's actually a contract indicated to just give them a supplemental oxygen. And a lot of times patients will have been on a C pap before they get diagnosed and then either the neurologist or the pulmonologist will switch some to a BiPAP ones they get diagnosed. But then also some patients do go the route of getting a trach and event which does require full time vent care a home or a family member or caregiver has to be able to do that. If you're looking at the overall score for the ALS-FRS a two point change is an indication of a significant decline.

So that's why sometimes it's good to look back in the chart, if you can see the scores over time because that lets you know, how quick is this patient declining? And then what does that mean for your overall plan of care and the prognosis and what you're gonna be able to do with them? Oops. Okay. As far as ALS management is concerned, unfortunately, there is no cure. The Ice Bucket Challenge is looking at more research. The money from the Ice Bucket Challenge is looking towards going towards more research, currently, there's only, two medications that are given for ALS riluzole is the kind of gold standard. That one if they if patients take it, the expectancy or the expected goal is to extent their live for about three months. Radicava is a newer drug, it's only been a couple of years. It is an infusion through a port, and you have to qualify for that drug. So, and I don't know all the exact qualifications but has to be relatively new onset. A, there is a cut off score, I think for the ALS-FRS and then you have to be able to demonstrate that either you or your family can do the port management at home because all of the infusions the patient goes home with the port. Nuedexta is a medication that is given to manage the pseudo bulbar effect. So it doesn't directly affect the ALS per se, but it does affect the . But there's not any other medications that really slow the disease process. Some patients will get Botox to manage the saliva. But other than that the medication management is pretty minimal. It's more that they're looking at just kind of their symptom management. So, if patients are having a lot of spasticity, a lot of tone issues they might do back within Botox, something like that. They can, if they have arthritic changes and other and mobile, they can do some payments to address that. We are looking at symptom management based on like respiratory support again, do they need a ventilator, do they need a BiPAP? Are they losing weight or they have trouble swallowing, do they need a feeding tube. Look at

from a physical therapy standpoint, safe mobility and quality of life, if they're having trouble with, they're walking, what are ways that we can make it more efficient and safer. So it's really just symptom management, palliative support, and focusing on quality of life and making it so that the patient is relatively comfortable. So talking more specifically about acute care in general. So patients can end up in the hospital for a lot of reasons. Patients with ALS generally will end up in the hospital for things like falls, they have progressive weakness, especially if they have some FTD and they don't necessarily know what their limitations are. Or sometimes they're just weak or they fatigue and they push themselves too hard and they have a fall and they can't get up and they have an injury. They can end up in the hospital for that. If they have complications with their feeding tube that could be either with the placement of the feeding tube or after the feeding tube was already been placed, if he was already been placed it with it comes out. Generally they will just change it out in the ER, unless there's some sort of signs of infection or something that causes them to be admitted to the hospital. But if they couldn't fit into placed, it depends on how they do it. Some hospitals will go through GI and have the feed into place that way the gastrostomy if they do it through GI the patient usually goes under the user sedated and patients that have respiratory issues may not come out of recovery as well.

Some patients will get there to place through IR and the sedations are a little bit lighter. So they may not be knocked out, it may not affect their respiratory status as much. So but if there are complications to run in the feeding tube that can also lead to a hospitalization. Respiratory distress is a big one. So as we talked about, a lot of them will have respiratory decline. Sometimes it's just a natural course of the disease process. And patients are just really uncomfortable at home. So they'll go to a hospital, family members will kind of panic take them in. But also because they're having trouble swallowing a lot of times they will get like an aspiration pneumonia, which will lead them to be hospitalized. So that's actually pretty common along with falls. And then with dehydration, again, relating to, the decrease going to oral intake, if they're choking, when the swallowing and they're eating, they might have less in taking in general. If they're having trouble getting up and going to the bathroom. A lot of patients will say, I'm not gonna eat or drink because I don't want to have to go the bathroom. I fell off too much to the bathroom, I can't make it on time so I'm just not gonna eat or drink. And so they will get dehydrated, which also makes them weaker, which also leads to more falls and it kind of spirals from there. So, those are a lot of the common things that will lead to a hospitalization for patients with ALS. Hopefully that makes sense. Okay, so what is the role of physical therapy? So this is kind of the overall role of physical therapy across the continuum of care, but also kind of relating to acute care. So, generally, we will look at their kind of gross mobility, right? So, can they get in and out of bed? How do they move in bed? And how do they stay another transfer, right? But we also need to realize that we need to look at what an appropriate level of activity is, so, we don't want to fatigue them. And I'll talk a little bit more about the specifics. Do they need certain equipment for home? How do we decrease their fall risk but yet maximize their function in their independence? If they're having pain, how do we manage that? Caregiver trading is huge and then quality of life. Okay? And

definitely because the turnaround for hospitalization is very quick, generally they stay in less than three days. So making sure we kind of address all the different parts to a little extent is gonna be very helpful. Okay. So for mobility. And I'm sure everybody knows how to do general mobility assessment but for patients with ALS, we definitely are looking at, how are they getting in and out of bed. So going supine to sit are they just going through long set, are they doing a log roll, can they roll on their own? If they have a hospital bed are they keep me in the head of the bed up the whole time, and there's kind of fighting in and out, are they bed bound, and they just really need help with positioning. So those are kind of things that we need to kind of be aware of. Some being a little bit more aware as opposed to just being like, their minister dependent, right? Transfers. We're pretty good at looking at specifically, like, how do they stand up? Can they stand up without their hands? Are they really rocking or they just kind of flopping down into the seats? Do they even have any function available to them to help them stand up if they needed it, right? If their arms are so weak that they don't, or their hands are so weak that they don't have any lift off? That's also a factor. If they're not standing for a long time, or they're not seeing much at all, really, how do they get into the wheelchair? Are they doing squat pivot? Are they doing sand pivot? Are they using a mechanical lift to get into the chair? I don't have too many patients that will do a slide board transfer, mostly because by the time they're at that level, they don't have the trunk control or the strength, combined with the arm function to do a slide board transfer.

So usually, once they're past like a squat pivot, like a dependent transfer, then we just do a mechanical lift. One of the standardized tests that's easy to do in the hospital, is a five time sit or stand, which is literally just as a zone standing up, sitting down, five times and timing it, and in theory, they're supposed to do it without using their hands. But, sometimes if they have to use their hands, I will still do the test and I just put a notation there. But you're looking for, when you didn't do the tests, does the quality of the sitting stand does it change? Do they get shorter breath? Is it safe? And so it's a pretty easy assessment to do doesn't require any extra space, right? Gait. So sometimes the gait assessment in the hospital can be pretty limited based on the space that you have, but looking at, what kind of device do they need. If you have room you can do gait speed out in the hallway for your patients that are a little bit more ambulatory. So, if they're having just very early set kind of mobility issues, maybe a little bit of foot drop, but they're not really using the device, but they can still walk is their primary mode of mobility. I will try and do more of an endurance walk. So two minute walk test, six minute walk test, depending on the amount of time you have, the space that you have. 'Cause you can get some pretty good assessments from that again, are they short of breath? Does their foot drop get worse? Does their posture change? And that can help you decide if they're moving towards at a higher level device as well. If they're pretty high functioning, again, not using a device really looking more balance kind of assessment, so the DGI the modified DGI, the functional gait assessment. Obviously, if you're limited to the room, you can't do too many of those tests. But you can also still generally test their balance so a lot of times when I worked in the hospital, I didn't necessarily do work continually all the time, but they are tested

or it could be good for looking at balance, the four stage balance test which is essentially just see if they can stand for 30 seconds with their feet, side by side, tweet together, tandem and then single them stands if they can do it or not. But that can tell you, kind of their balance situation, depending on the length of stay for the hospital, you may or may not be able to do a wheelchair assessment. If, the patient looks like they're gonna be there for a long time, sometimes their family members will bring in their power chair or their manual wheelchair. But usually, if it's just gonna be quick in and out, they're only gonna be there for three days, you may not see their chair. So definitely asking, what kind of chair that they normally have at home 'cause that kind of tells you their level of mobility one, but also looking at a chair, might they be able to get up into, like when they're in the hospital. So they're usually in a power chair and they're using a higher left to get in and out of the chair. They using that till in space, mechanism on their chair a lot. You probably don't want to leave them up and it's just a standard hospital chair because it's gonna be probably not enough support and it's probably not gonna be enough comfort for them. Let us tell you a lot about their current mobility situation and then also looking at their cushion if their chair happens to come with them to the hospital, it is a good time to look at their cushion all the times in the outpatient setting, I may not get them out of the chair so I can't fully investigate their cushion to see if it's intact. Can the patient and the caregiver manage all the different parts? How are they propelling it? Does it have a joystick control? Does it have a goalpost out control?

If the patient has limited hand function, they have connect control. Sometimes they will do the head controls are the set puff control depending on the patient, but they can also move the controls to their rear their wheelchair so that they caregivers can steer it. So looking at those can be very helpful in determining what kind of what your patients can be for but also they need any recommendations for once they leave the hospital. Okay, I see. Okay. So one of the hardest things about ALS, and being a physical therapist is leading people with ALS is, how much activity and exercise is okay? Kind of goes back and forth, there was a lot of talk before about, it's a progressive disease. And so I don't want to do anything, I don't want to make it worse, I'm just gonna stay still, and then that ended up not being very good because then people would avoid the exercise, they will get to condition and we wouldn't know, are they getting weaker because they're getting deconditioned or because the disease is progressing? The other thought is, it's something that's progressive, I can't do anything about it. There's no other way to treat it. Use it or lose it, I'm gonna do all I can. However, if you out the muscles with fatigue, the disease is also gonna progress quicker. So, we want to try and find some in between so that a lot of the research is now showing that a moderate level of activity or exercise is okay. Okay. So, I use the Borg scale, to look at how hard a patient is working. So there's two different scales that are out there, the one that goes from zero to 10, one that goes six to 20, basically at the very beginning of that scale, so either the zero or the six, that's equivalent to like laying on the couch, not exerting any sort of energy, right? So again, that's in the range of being deconditioned and getting the ultimate muscle atrophy that way. Now, in the hospital, a lot of times we keep the patients in bed, because we don't want them to fall, or they have so many

tests or whatever. But, as acute care therapists know, it doesn't take very long for patients to get weaker and get deconditioned. So being very aware of how much time the patient is staying in bed, especially if they are ambulatory obviously. On the flip side, this kind of red range, so it's very, very hard or this maximal range that is working out to the point of fatigue, where you're getting a lot of muscle pain, cramping. Kind of like if you ran a marathon but didn't train for it. We don't want to be in that range. One you feel terrible, right? But two you burn out the muscle faster. So I like my patients to be in this green range. So once they get to the somewhat hard range where maybe they're breathing a little bit hard, maybe they feel a little bit tired, but if they stop and rest, they recover in a timely fashion. That's a good time for them to stop and take a break. So that could be for their walking, it could be for the gym exercise, it could be for their ADLS. It really just depends on the patient's level, but trying to stay kind of taking that rest in that green range is gonna be key. Okay. And obviously it depends patient to patient. I have had patients that, before they got diagnosed, they were marathoners, they were ultra marathoners, they were cross fitters.

And so for me to be like, yeah, I need you to, like walk around the block once is probably still gonna be in that, hardly anything, that very light range, it's not gonna be enough for them. But if you were somebody that was previously like a couch potato, not real active, walking around the block was a real push for you before that, now walking around the block three times a day every day might put you into that red range. So again, just take it into account your patients level of fitness beforehand, when you prescribe their activity, but this scale, I will print it out for them and I will give it to them. And I say like I don't want you to neurotically think about every activity in what you're doing. But if you're starting to get tired, kind of check in with yourself and see what range you're in, okay? And generally speaking, let's go back to this scale here. It shouldn't take them longer to recover that to them to do their activity. So if we're trying to shoot for that, green range, that somewhat hard range, if they go out for a walk, and it takes them half an hour to get into, let's say, a 13 range, and then within a half hour, they come home and they take a rest and they can do something else. I'm okay with that. But if they walk for half an hour to get into that 13 range, and then they take it out for three hours, they've done too much, right? Or if they have lasting soreness the next day, then they've done too much. Okay. And generally for all my patients ALS or not, I do recommend that they kind of have a comprehensive exercise routine. So to be upright during the day, we generally need to, involve balance and cardio fitness and strengthen stretching, right? It's just different for patients that have ALS. So for patients that, maybe are a lot weaker and they can't do the exercises on their own, do we do a lot of resistance training? Probably not, because we're going to burn them out, right? To do a lot of aggressive stretching, probably not especially if there are starting to get some laxity in their joints already, right? But maybe some active assisted, active intuition might be okay. For patients that have a lot of tone or specificity, the passive in your motion could actually be very beneficial to them. So they don't have to do more than just for comfort. If they have some of their core muscles preserved, I do encourage them to do some more core strengthening, working on their abs and they're rocking their hips because that is your foundation. If that part

was strong, it is not much easier for you to move your arm in your legs to hold your posture to breathe. If you have really weak postural muscles, when your trunk is collapsed, breathing is terrible. It's hard, right? But overall, general advice that I give my patients is that if you can move that body part, I can see gravity without a little bit of resistance. I'm okay with you continuing to do resistant or strengthening exercises. Once you get into the point where you can no longer move that body part fully against gravity, I still want you to use it a little bit, but it's gonna be more for functional use. So if you can't lift your arm up, over your head getting dressed is really getting more difficult. But you can use it down low I'm okay with you. Still using it to use and also using it to push up from the wheelchair. I'm okay with that. But also looking at the rest of that limb. So I will have a lot of patients that have a lot shoulder weakness. And their real problem though is their hand weakness. So maybe their shoulder ends up being about like a three, three plus, but their hand is more like two minus two kind of range. But they're like, oh, well, my shoulders still strong. I wanna work out my shoulder. Can I do weights? I always say no, you can't do weights because you can't hold the weight. And the risk of injury is too high, and that went into their three plus, it's still pretty close toward three.

So at that point, I will switch them over to be more functional use as opposed to strengthening, okay. For their cardio. That's okay for me for walking, stationary bike. I've had one patient that would actually definitely helped them tricycle bicycle road bike, and he rode that bike till the day he died and that was the way he could get in his cardio. So, I don't care how they get it in. If they get it in, I do want them to be kind of subthreshold. So stay in below 50 or 60% of their max. We are not going for really high exertion. We are not trying to burn out your lungs, your diaphragm or your heart in any sort of way and then being just really conscious of the respiratory status and again, being aware that these patients might have other lung condition they might have COPD, emphysema at baseline. So they might already start on shorter breath. But, trying to put them in that fatigue range can be very scary if they're already compromised, okay. And then just general like that one stream. If they're staying need and they're walking is pretty good. I do have them do a lot of work in staying in balance so Romberg tandem kind of position, but you can also work on sitting balance, especially in the hospital. Okay. Okay, so the other thing kind of that goes with your exercise prescription is energy conservation. And this is huge and this is an area where physical therapy and occupational therapy do overlap a lot. So, I would say for me, both sides can address it, but it might depend on how your hospital set up. I do go over a lot about different ADL and IADL modifications. Is that worth it for them to get into the shower and stand the whole time and feel so fatigued when they're done that they literally can't do anything else for three hours? But they did it by themselves. Or, can we recommend that they get a shower seat whether they have somebody help them, so maybe the shower only takes 10 minutes, they're not worried about falling, and then they can get out and do other things. So, taking into account some of those different activities, if they're still cooking, are the things that they can prep sitting at the table, so they don't put all their energy standing. In the hospital, they don't have to do a lot of things like for themselves, like, they don't have to pick up the clothes or wash

their clothes. But I do like to give the educational while they're in the hospital, so that way when they go home, they kind of know what to do. I like to recommend that they do frequent but short bouts of activity throughout the day. So if they are able to get up and change positions every hour, and so for your bed level patients that might being flat in bed for a little bit maybe sitting up either with the head of the bed opposite on the edge of the bed for a little bit lin knocked down. If they have bed exercises doing them every once in a while. So trying to like just move a little bit every hour. For your regulatory patients. Again, it's not sitting on the couch watching TV, but, every hour, can I get up and I can take a little lap around my house, or if their endurance is still pretty good. I still wanted to do their walk outside or trying to get out and go for that longer walk to maintain what they have. What I don't want is that they get up in the morning and they spent all morning trying to get dressed, take a shower to eat, and now it's noon, and now they're exhausted. And then they go for a walk and then they come back and they sleep. The rest of that afternoon, they don't eat dinner and then they're really sore the next day, 'cause now they're essentially out of commission for two days, which is actually gonna make them weaker in the long run. So I advise against pushing the exercise to the point of any sort of muscle pain, joint pain, progressive muscle weakness meaning that the more the exercise that weaker they feel. Also cramping, increased fasciculations, respiratory distress, more than like a little bit of shortness of breath that goes away when they sit and rest, and then severe or lasting fatigue that last again longer than it took them to do the activity. And definitely the last thing until the next day, we want to really stay out of that range, 'cause at that point, we're really kind of burned out the muscles more than really we really want to.

Okay. So equipment, you guys should be familiar with most of these pieces of equipment. And again, you may not have these in the hospital to give out to patient, but you might order them or start the order process or at least assess what they currently have is even still appropriate for them. Okay, so everybody should be familiar with a front wheel walker versus a four wheel walker, right? And how do you determine which one? So generally, the front wheel walker is gonna be more stable, right? But it doesn't have a seat or a way to rest. So if your patient is more limited by their balance, the front wheel walker might be a better option. However, the balance is pretty okay, but they have more of the bulbar symptoms, they're more limited by their breathing. The four wheel walker might be a better option, okay, 'cause they basically have a built in seat with them. The other thing you need to consider though, is their hand function. So if you're patient has the limb onset ALS, and even soon as with the bulbar stuff that our weakness comes quickly after the bulbar symptoms start, they have a lot of shoulder and hand weakness. Can they even manage the brakes on their walker? Can they navigate the walker, can they push the walker? So yeah, they might need something for balance but if their arms aren't strong enough for them to actually manage the walker. Even though they still want to walk, I might still move forward with getting them a wheelchair. Because if anything that wheelchair stage is gonna come quickly. We're looking at their wheelchair. We're looking at manual chair versus a power chair or even maybe like a transport chair, right? They all have their pros and cons. To get a wheelchair even the power chair, they have to still be able to use it in

their home to get it paid for by insurance, generally speaking. Excuse me. But regardless of the type of chair we need to consider the positioning in the chair if they have enough trunk strength to sit in a manual chair. Or if they need to have a custom chair with built in supports, can they position themselves easily? The nice thing about a powerful chair is that they often come with a tilt-in-space mechanism so that they can do some of their pressure relief on their own, where they can elevate their legs on their own. Can they move over in their home of their houses older? A power chair may not fit in their house. And also can they get it out of the house if they're going out outings? You would have to get a ramp to go out the front door you have to get a lift for your for your car or your van and the lift for the wheelchair attachment for a car is generally not covered by insurance. So, what kind of chair can they use the manual chair obviously or transport chair is much lighter. It's easier for family members to get in and out of the car, get around the house, but it's a lot harder to get it out of once the patient is very weak. And then also put intention to do you have other equipment that needs to be transported. So, patients might have a speech generating device, a suction machine and a BiPAP, maybe even their two feeds, and they all have to go out with them, on a manual chair, that's a lot of stuff to carry around on a walker, that's probably not gonna happen, but if you have a power chair, that doesn't allow you to take all your equipment kind of with you. So just trying to keep those things in mind.

So if a patient comes into the hospital, and maybe that they're using a walker already, but you're like, you know what, they're really, really unsteady or their hand functions is not that great or their breathing is not kind of in a safe ambulatory zone that maybe needs to make the recommendation for a wheelchair console moving forward upon discharge. Okay. Somebody also have physical therapy, or occupational therapy need to look at as well we do about things like splinting, bracing and compression. In the hospital, they're pretty good about giving people like that prefer boots if they have any sort of like skin breakdown or position to their heels, so that they're not in the bed things like that, but also what about home? There's a patient need to pray for boots for home or they can just do position, right? But we weren't making our different recommendations we need to think about do we need the splitter, the brace for tone reduction, contraction management, edema management, position in a comfort and then we also need to consider energy conservation. Again, okay, that's gonna be kind of a running theme throughout ALS is energy conservation. So if you're looking like an ankle brace or an AFO, obviously, the more stability you need for an AFO, the heavier it's going to be. So if you have patient has really poor ankle control in all directions, more than just the foot drop and they probably need a solid AFO the problem. I mean, it's great because it gives them stability and stamps, right? But then they also have to move it and so that brace is very heavy. Do they have the hip strength or the core strength of the balance to advance a solid AFO, right? In these pictures here though, let's see here. So this one here, it's just an elastic band that attaches to the shoe laces. The downfall is that you have to wear shoe that has shoe laces 'cause it needs a little the attachment there, okay? This one is just a lace up ankle brace that has a shop kind of across the front of the ankle, but it also has like a figure eight loop. I like this brace honestly because it's cheap. You can get it off of Amazon generally for less than $30. If

you size up that you can also maybe kind of like in a folks if you size up, it does control the ankle and multiple planes. So if you think that patient is progressing quickly that they may not have time to get in AFO before they're not ambulatory any more than, trying to do like an off the shelf ankle brace might be beneficial. And then this one here provides mostly the medial lateral support. And it does create a little bit of stability for the player function, Dorsey function but there's no Dorsey function assist like you would have within AFO like this. I do really like the carbon fiber AFO the floor reaction kind of style ones. They are a lot lighter, they fit in the shoe a little bit easier. They're definitely easier to get on. They can be a little bit more expensive. So depending on the patient's insurance, that might be an issue but again, really looking at the stability, the need for stability versus the energy expenditure and then also, how long do you think they're gonna be ambulatory? And how long is it gonna take to get that brace? If you're looking at their maybe their ALS AFO scores and you're like, oh man, they're declining really quickly, every time they get assessed, it's going down under the two points. They may not be inventory for that much longer. So working to really get a brace of him and maybe cost the patient a couple hundred dollars to get there for a couple months. They may not even be able to use it once it comes so really could have thinking about that and see what might be the patient's best option. Okay. Okay, so looking at hand splits and arm splits.

Okay, so the... Let's see the one here. This one is just a general off the shelf carpal tunnel style splints. That one can be very helpful if the patient has a lot of weakness, and you're just looking to protect the wrist joint. So when the hand and the wrist gets too weak and the hand is just hanging down, a lot of times patients will complain of pain, just because all the tendons or ligaments in the joints are all just kind of getting stretched. So putting it in a brace that just kind of gives a little bit stability can be very helpful. Or if the patient has a little bit of hand function, but they don't have the wrist control. Giving them a little bit of stability either with a brace like that, or even with just like a thumb spike a style splints can give them enough hand control to maybe like power their chair. Okay. This one over here is more for positioning. So especially for patients that have issues with their hand kind of closing up into a fist position that makes them at risk for things like skin breakdown and infections and the crease of their hand. So having your hand out a little bit does keep your hand from getting too tight. This one down here on the bottom. It's just a compression glove and they come fingerless like the one of the picture or the full fingers, okay? So if they're having swelling issues that is a good option especially like in the hospital. A lot of times they do stock the compression gloves like that and so that's an easy thing to put on in the hospital, some of these other splits you would have to order and it wouldn't necessarily come before they leave the hospital. For their shoulder. This one here is like a Hemi sling. And the Hemi sling come in different styles that have them that are more kind of elastic that how was it a more neoprene, they have ones that have lots of different stripes on them. But if they're having shoulder weakness and they're having, like I said look station and the shoulder joint for comfort a Hemi sling can be very helpful. Again, in the hospital, you may not have that. So you probably have something more like this. That's true like envelope style sling. That is not my favorite sling for overall positioning

throughout the day is because it keeps them in that kind of internal rotation position where the shoulder is gonna get tighter will cause more pain in the long run. But if you need to keep the arm in a position where you maybe you wanna protect it for transfers, go ahead and put the sling on, transfer them from the bed to the wheelchair once there in the wheelchair, you can position them with the arm rest or the pillows or whatever and take the sling off and then put the thing back on to transfer them back in just so their arm is kind of not hanging down the whole time. So that can be something that's helpful. I do have patients that will use that even at home to the caregiver will just put that on just for the safety during the transfer. Okay. Okay, the cervical collars are a little bit harder to do in patient If the patient has a lot of head drop issues or neck weakness, it does cause quite a bit of pain on their neck. And the region, if you can imagine like your heads really heavy, and it's just hanging down, right? So, aside from just the way it feels, it also affects your ability to eat and talk and breathe, right? If your airway is getting kind of squished, it also affects your saliva management. So a soft collar is something that's easily accessible in a hospital. It's not gonna be ideal. It doesn't give them quite enough support. But it's better than nothing. And if it's something that you have, they can wear it. The early stages of a head drop, meaning that they go through most of the day and they don't have real issues with their neck. But then maybe in the evening, it's hard for them to like watch TV 'cause their heads hanging down. Will have them were the cervical collar just as needed for a little bit of rest. So that's something that's easily done in the hospital.

You can also look at doing something more like an aspirin collar. They have those as well in the hospital and they're easily accessible. They are bulkier and they are heavy. They're hot, so sometimes patients don't like them. And especially if they have any sort of like airway issues like having something else around their neck for that stuff bulky sometimes makes them really distressed. This one on the side here. This one is called a headmaster collar. It's a collar that's probably most used for patients with ALS. It's a hard collar, but it's bendable so you can mold that piece in the front. So this piece here that goes under their chin, and then it kind of looks around here. This part here is kind of multiple, so you can fit it to the patient itself. And then there's a strap, that's just a vocal shot that goes around the back. That really allows the patient to hold their head up. But still not feel like they're being like, suffocated, and it's pretty lightweight. It's easy to fit. The only thing when you measure it is you need to measure the length from their other jaws. So from like, right at the end of their jaw here out to their chin, and then you can order online or through a process it or just depending on what your facility uses, okay. Okay, so, working in Acute Care, you guys are all very familiar with the different hospital beds that are available. So while they're in the hospital, definitely you want to consider their positioning, especially for breathing and skin breakdown, which is, everybody's really position about skin or where do I position skin breakdown and not getting sore. So they turn them all the time, but also breathing if the patient has maybe mild respiratory compromise, but they're not needing a BiPAP or they're not needing a ventilator. If you can even just position them up a little bit, it does take some of the work of breathing away. But the other side too, is if you notice that, hey, the patient really needs to have the head of the bed up all the time to breathe. That

might be with a discussion of what do you have a home? And if they have just, or regular I'll just flat bed at home. Do you need a wedge? Do you need a hospital bed? So that can be very helpful as far as making referrals for discharge at home? 'Cause maybe that's something that they're needing right now. And then considering the the mattress type, do they need an air mattress if they're like fully bed bound? They can't position and they're pretty dependent. Do you need an air mattress? Do you need an air mattress overlay or does that air mattress make it too hard for the patient to get out of bed because they are kind of slippery. So, kind of making that assessment. Teaching the family members to use a mechanical lift if you need to hire lift to get in and out of bed is very helpful sometimes. Do they need a bedside commode, do they need a shower bench, are the things that they need to use in the hospital if you do your mobility assessments. And, I like nursing really needs to make sure that they use the bedside commode the patient can't walk far enough to go to the bathroom. They might have the strength in their lives, but maybe they don't have the respiratory status, right? They need to use the bedside commode or the patient transfer is just too risky. You have to use a mechanical lift to get them up. So using your assessment to then make the recommendations that's gonna be the best for the nursing staff and their safety, but also to kind of maximize the energy comes of it for the patient and the comfort of the patient, okay. And they're also looking to see what you need for home discharge.

Okay. So how do we maximize their function? Okay, so in the early stages, function is generally pretty high, they're walking around, they're not using a device, they're doing their own ADL, a lot of these patients are still working. They might be working full time, sometimes very strenuous jobs. They might have weakness, but just very few muscle groups. And then just they're not really that limited. And in this stage, they may not even have an ALS diagnosis, because if you can imagine that there's still high functioning, people will just make oh, it's just a pinched nerve or you just sprained your ankle or you just need to work out more. So they may not even know that they have ALS in this stage. But if they do have an ALS diagnosis, but they're still working in pretty high functioning, that really the goal is going to be more preventative. So you can educate them on the appropriate levels of activity and exercise to prevent the weakness from occurring faster. And then at a certain point, sometimes you can still improve things I have had several patients that were able to improve their strengthen their balance a little bit at that stage. And then in the middle stages, you get more noticeable weakness in their trunk, in their extremities. Definitely their bulbar symptoms start to become a little bit more pronounced, they start to need a little bit of help with their self care, they might need a device for their mobility, so maybe we're relying on bracing, walkers, things like that. And we're really looking at activity modifications, energy conservation, compensation and getting assistance to try and conserve a little bit energy. In the late stages, they're pretty dependent they're probably needing help for all their self care items or activities. They're probably more wheelchair bed bound at that point, they have a lot more speech swallowing, respiratory issues, they might be using the BiPAP almost full time, they might be getting most of their feeding either solely through their feeding tube or at least mostly through the feeding tube. And at that point, it's mostly safety, comfort, and kind of the palette of focus, supporting the

family on how, to kind of best care for this patient. A lot of caregiver training. How do we assess the fall risk? It's probably something that we do all day, probably even when we're not at work, right? But definitely in the hospital, you can establish the best level of mobility, communicate with the rest of the staff in the medical team, with the best level of ability and what equipment to use. This kind of recommendations are very helpful right now on the board if you can, and then ensuring that the patient has the best call light. A lot of them might have hand weakness and can't push that button. So do they need one where they can just, that's just a bigger button that they can push with their head, maybe you put it at the foot of the bed, so that they can push it with their foots. Also making sure that the nurses know if the patient has speech difficulty that when they push the call light, and they may not be able to respond back to say, like I'm in pain, or I'm hungry, right? The nurses have to physically come in the room to talk to them, and maybe even use one of communication devices for the patient. If they have their communication device with them. Definitely, if they're going home, you want to make sure that again, the same thing, having the best level of mobility, working with them to make sure that they have the home modifications that they need that their equipment can actually get physically throughout their house without having too many obstacles or barriers. Minimizing things like throw rugs, right? Things that their new equipments gonna trip them up on and they're really focusing on the energy conservation. In the hospital they didn't have to do a lot for themselves but when they go home, they should do that a lot of their own self-care. How do we conserve that energy?

Okay. The pain management for ALS. Pain is very common in these patients and not because of nerve damage, not from the ALS itself, but it's usually related to prolonged immobility and like the pressure that comes from that, contractures, skin breakdown, right? Muscle spasms and cramps especially if they're not well managed can be very, very uncomfortable. If they're getting a shoulder civilization so really making sure that you're positioning them on pillows or arm supports or something like that, bracing. And then definitely if they have any other premorbid health issues. So definitely arthritis, prior surgeries other health issues that may be already caused pain and now they're in mobile, right? So with arthritis, all of our patients with arthritis, we always tell them things like motion is lotion, right? The more you move, the better you feel. Well, now they are so weak that they can't so any area has arthritis, and now they're forced to be still because of weakness, we expect that you're gonna have pain in that area. So really doing a lot of patient education, on positioning and range of motion and comfort. Also, teaching caregivers the best way to transfer patients. I don't know about you guys, but for me, it's always terrifying that wouldn't you see caregivers transferring patients and they automatically just pull them up by their arms, it just it's terrifying to me. one, you can't be close enough to the patient to help them if they fall. And two, that's gonna cause a lot of injury especially if patients already have shoulder weakness, wrist weakness, that can be very, very, very unsafe transfer. So do they need to just change the way they hold the patient or change the way they stand? Do we need to change to a lift? or different equipments, right? How do you use the Hoyer lift? In the hospital, that might be a good time to teach them how to use a Hoyer lift. When they

go to like an operation clinic, there probably isn't a Hoyer lift there for them to even see. and you're recommending a Hoyer definitely or mechanical lift definitely doing that training before they leave the hospital. And then how do you position them for comfort? Whether it's in bad, whether it's supine? Is it sidelining, is it sitting in a wheelchair by thinking about that their comfort for their shoulders and their joints, their neck, but also their breathing, okay? And then kind of reinforcing that activity, pacing and the monitoring for the caregiver. With caregivers, it goes both ways where it's like you they really want to push the patient they want them to get better, but really, they're wearing out the patient. Or sometimes it's that they're just doing, they're just going through the motions, but they're not really paying attention to how fatigued the patient really is, okay? Dealing with quality of life can be very important.

Okay, so really needed to establish what is important to the patient? Do they solely want to just focus on I just need to breathe, I need to be comfortable. And whatever position I can be in, then that's the way I want to be. Or is it like, I still need to go out and I need to go to my grandkids soccer game, right? And if I have to go to their soccer game, and I have to take an electric wheelchair in a van and my suction machine and all this stuff, but I'm gonna do it, then we have to, how can we help them so that they can do that, right? So just really figure out what's important to that patient. Really help them problem solve the different modifications that they need to meet those goals. How do you prioritize your energy is worth it to you just burn all your energy trying to take a shower in the morning and then not be able to do anything else in that afternoon, or is the patient's high priority like, I need to take care of myself. So yes, it is worth it for me to burn my energy to take that shower, right? And then really making sure that the family and the caregivers and the medical team, we're all kind of on the same page, especially for people that aren't familiar with ALS. It may be on the therapist, to kind of provide that education to either other medical members or the patient or the family. These are all different members of the multidisciplinary team, right? So, you guys are all familiar with what physical therapy does. The patients have seen neurology but also respiratory therapy, speech therapy, occupational therapy, nutrition services at the dietitian, palliative care, social work. The gastroenterology or the interventional radiology depending on who places a feeding tube. Psychology and mental health is huge. Nursing, obviously a huge part of being in the hospital. The adaptive equipment specialist probably won't be seen in the hospital but might require a referral after the hospital. And the same for the ALS Association representative, okay? So, the neurologist, again, they may not see them in the hospital, but they probably have somebody outside of the hospital that they see. So it's nice to look back at their notes, especially if they are neuromuscular specialist to kind of see what the overall plan of care is for this patient. They're the ones that do the EMG and the nerve conduction study and they ordered the MRI, the labs, and they really do the diagnosis and the medication management. The respiratory therapists, they will see in house in the hospital but maybe also on the outpatient side. They do the pulmonary function tests. They help have that discussion, if they need something non-invasive like a BiPAP or something more invasive like intubation or trach, if those are the patient's needs, how sooner they, to that stage, they could go over different breathing techniques, also

different positioning to help them breathe better. And they also can help manage the settings on those different pieces of equipment. They might help with a cough assist and a suction machine as well, if the patient has those needs,. Speech therapy, they do the swallow assessments, and then what they have done that they work with a dietitian to do the diet modifications to ensure that it's appropriate textures, but also that they're getting the appropriate nutrients, calories, right? Again, with the dietitian, they have the discussion about the feeding tube and whether or not that's the route that the patient wants to go. They are huge in establishing a way for the patient to communicate. So there's obviously very high tech devices. Those don't end up in the hospital, usually unless the patient brings in their wheelchair and the whole setup, or they're gonna be in the hospital for a long period of time. But this down here on the bottom is an example of a low tech kind of device. So it's just a paper and then you can just put on it. And that patient either mods or blinks or says yes, depending on their level of communication, to communicate with you. In the hospital, they have different ones to that maybe have a body chart or some key phrases.

So there's a lot of low tech ways to communicate with the patient. So definitely working with the speech therapist in the hospital to figure out the best way for you and there was the nursing staff to communicate with the patient. That can be really huge. And then not so much in the hospital but on the operation side. The speech therapist might also address the cognitive changes. The occupational therapist, again will work with the ADL side, IADL self-care, help with the home modification. How do the patient feed themselves, do they need adaptive tools? Can they use adaptive tools? Are they too heavy if you added extra like, grip on it to make it a wider grip, but now we've added weight, right? And then they might help with some of the energy conservation and also splinting recommendations, especially for extremity. Oops. The dietitian is a very helpful resource, especially if there is weight loss. Each hospital kind of varies depending on their setup of who manages the to feed the training. So is that the dietitian, is that GIIR kind of just depends. But the dietitian does work closely with the speech therapists to determine the nutritional needs for the patients. Palliative care and social work are probably one of the most important members of the team. They help the patient with their advanced directive, the pulse, financial resources, emotional support for the family and the patient. They really are key in helping to make sure that everybody is on the same page. Looking at the patient's POLST form is very very important to know if the patient is truly, when it all measures if they want to be a DNR, DNI if they want the feeding tube, if they want the mechanical ventilation, making sure everybody on the team knows what the patient's wishes are. And then also checking them periodically, because sometimes it does change. The patient sometimes starts as a full code, and then decides that they no longer want those measures. And then, again, other members of the team, so GIIR for the two placement and management, psychology, mental health, especially if there's any depression, coping issues, nursing especially while in the hospital, and then adaptive equipment specialist they will manage like the wheelchair parts, but you might also have with it is involved in any sort of bracing and then ALS Association representative for the area that you live is gonna be a huge resource because they can help with other outside resources, financial

resources and equipment it needs. Okay, so to decrease the stress and an anxiety in the hospital, right? Obviously, for clinicians, ALS is a very scary diagnosis. For patients being in the hospital in general is terrifying, right? So just letting the patient know that you understand ALS, you've heard of it before. You've heard of it outside of the realm of the Ice Bucket Challenge, right? You want to help the patient really paced their activities, so they don't get in that danger zone of really being fatigued or shorter breath or when pain. Utilizing the full medical team, don't feel like as a therapist, you have to manage everything on your own. Use the occupational therapist and the speech therapist and the nursing staff and the dietitian and definitely definitely using palliative care and social work. Discharge players to your advantage if you can. If anything while they're in the hospital, really maximizing their comfort, so training the nursing staff on how to position them. Family members as well, family can be a great advocate for range of motion, they can do that for you, if you teach them how to do it. Establishing that communication device with a speech therapist is gonna be really important, because it does conserve a lot of energy. It takes so much time and effort for a patient to try and force that words when they can't make them. And then from the clinician side, playing that like 20 questions, guessing game, just it takes too long. And everybody's exhausted at that point.

So using that communication device can be very helpful. And then like we talked about using the best call light, if it needs to be by their head, if it needs to be by their hand, by their foot. If they have the ability to do it, I guess one that's also very helpful. Being aware of the respiratory status, like I said earlier, these patients are CO2 were retainers okay. So, we don't want to put them on supplemental oxygen, even if their oxygen is going low, we want to leave that up to the respiratory therapists to maybe make modifications and maybe their BiPAP settings. But you might also have to ensure that the patient can use their BiPAP at rest, as a way to kind of regroup, recharge, and take a little break. So, it could be for napping, but it could be like we just went for a walk, they just went for a test, or maybe they're going for a test and they're gonna be tired, put the BiPAP on for a few minutes, let them really rest at least their lungs and their diaphragm and then they can be on their way and that can really help them feel a lot more comfortable. And then I'd be even a recommendation that they use for home is when you go home when you're feeling tired, just pop the BiPAP on a little bit during the day. Again, respecting the patient's medical wishes. So these are their POLST and their advanced directive. Training the caregivers and then making sure that you could have done your thorough assessment so you can make recommendations for the patient to follow up in outpatient, whether that's home health or again, outpatient. Okay, so we have a little more time. So I think our two case studies so what I would like to do is maybe we'll go over the first case study, and then we'll go through some questions. And then if we have time, we can do the second case study. Otherwise, you guys can look over the second case study on your own, okay? So, the first case study is a 63 year old male. He had trouble speaking that started about a year ago, some choking with eating a few months later after that. He now has some mild hand atrophy that started about six months ago, and that's the time that he was kind of undergoing workup and he was diagnosed with ALS. He does live in a two story home with his

wife. He is a former runner, a retired teacher. He is in the hospital because of worsening shortness of breath he is currently a full code. Okay, so physical therapy came in, your evaluation, you notice that he's awake, he's alert, he's in the hospital bed, with the head of bed is up pretty high about 45 degrees or so. He's a mildly too stressed out rest. He's very arthritic, very hard to understand. Short of breath very easily when he's speaking, only getting out two or three words at a time, before he really starts to huff and puff. He has significant atrophy in both of his arms. He has shoulder pain on both sides, and he knows like a half fingers have legs on the left-hand side. He's got kind of gross with circulations through both arms, both eyes, on his tongue and his strength. He's pretty weak and his opportunities three minus at best, but two minus really weak in that lesson, let's turn into cell blocks. His leg and on the other hand is pretty good. Still generally about five throughout but he's getting a little bit of weakness in his Dorsey flexors. But for the most part, I would say, functional lower extremity strength. Okay, with your mobility assessment unit in and out of bed, he does keep the head of the bed up because of the shortness of breath, but he's able to get to the edge of the bed with min assessed. If he has to go flat from supine, he does require more assistance monitors. But then that he to get kind of back in about setting supine. He kind of just flops in a bed min assist but very poor control overall. And then we'll transfers he can stand easily he doesn't need to use his arms, not really having any immediate balance issues with that, he's walking, maybe a slight wide basis support but otherwise not using this assistive device. His arms aren't really swinging but they're also pretty weak. He does have more shoulder pain with the walking as his left arm hangs down. But for the most part, he's walking up and around by himself but he is a little bit of shortness of breath was he ventured out into the hallway. So within his room, he's five foot in the hallway, he shorter breath.

Okay, so what kind of standardized tests could you do for this patient? So feel free to chime type in ideas that you guys might have. All right. So I've seen a tug, two minute walk test. Right? So pretty good. Lots of those times to just stand, right? Frog, all right. So that's all look like really good ideas. Okay. So, again, so like, we talked to five times sit to stand, super easy to do in the hospital, doesn't require any additional space or all you need a stopwatch, really, you can just do it from the hospital room, you know that he's already saved to stand, right? So you don't have to worry about that issue. But he's also there for shortness of breath. So you can see it as that really sort of fatigue him. So that is very good. Like a lot of you shouted out, two minute walk test, six minute walk test. Again, looking more at the endurance, you can check his vitals depending on which floor he's in the hospital, he might be able to monitor his vitals a little bit more carefully than other floors. But the other thing about the the longer endurance walking test is seeing how his posture, his gait really changes. A lot of times walking within the room, and I can attend foot space, you're like they're walking is normal, but then when you really challenge them outside. You're like oh, the longer they start to walk, they do get a little bit of flip flop or their posture starts to change. Their head starts to drop. Maybe they have a really hard time navigating obstacles or turning their head to skin especially if their arms or their neck are starting to get weak. So, in addition to the actual two minute walk test itself and looking at the vitals but

looking at the further gay assessment, so very good. I did see some other things like functional reach, those could be good to it just depends on his arm strength. So he may not be able to reach out as much but borg would also be a pretty good test. I think I saw that on there too. And again, obviously checking their vitals, right? Okay, so what could you do to make the patient more comfortable during their hospital stay? Yep, so the sling is good. I see that one of there position sitting or lying down or in bed, right? But definitely position their arm. Positioning their stuff so they can reach it, right? Perfect, okay. So lots of good ideas using the communication device, that communication board, right? So, a lot of you guys, right away saying, using their sling in their position for comfort, when he's walking, his arm is hanging down or even sit in the chair for a prolonged period of time arms really heavy and there's hanging on that joint. So if you can take some of the weight off, that could be good and also will maybe help with his balance a little bit if his arm isn't just hanging down when he's walking, right? Positioning in bed to improve breathing confer as well. Communication device, if they're having a lot of, communication issues too, you might also ask us either having swallowing issues, oftentimes they go hand in hand. So that's a good thing to screen for to increase the speech therapist needs to come see him. And then, maybe asking respiratory therapy if they need to do an assessment, if he needs to use a BiPAP, if you need sees it, arm rest. I think I saw somebody other to saying like positioning things are easier to reach, which is huge, right? Especially if you don't have a lot of arm strength, or if you're trying to reach forward but you can't read well, and now you're gonna decrease in that little space. So that could be helpful. And then I think on here, I lost it. I think somebody's comment about using a platform walker as well, right. So that will give them a little bit of arms support. So maybe they don't need the walker so much for balance, but it supports the arm and might stabilizer their breathing a little bit. And you would just have to look and see about the energy energy expenditure for that one, but that's also a good suggestion.

Okay. So the patient was cleared for pneumonia still have shortness of breath, probably more religious to the progression of the disease process for ALS, and not some sort of acute illness. He was deemed safe to go home, but he's gonna use the BiPAP more home for their recommendations from respiratory therapy. What are some safe PT considerations to help with a safe discharge. Right. So refer all to home health. I see a hospital bed, right? Lets see. Yeah, definitely ask him about stairs. Teach him the energy conservation. Right? Yeah, and it might be a good idea, even though he is pretty able to try to do like a home safety console, how does he really truly do, on the stairs or navigating on his own space. The hospital like we do get them over. We walk there when we get them in and out of bed. And there's a flight of stairs that we can try, right? But it's not the same. We kind of set them up for success everything is nice and open. There's a lot of obstacles. We don't have to do things in sequence, right. So sometimes it is nice to see them in their own home environments. PT home leaver that's a good one too. Yeah, so lots of good suggestions. So again, home health versus outpatient referrals. Looking at equipment probably needs a hospital bed. And then as far as your mobility, do we want to continue with no device? What did we think? Did we try the platform walker? Did we like the platform walker? Did it take up

too much energy? Do we think that he's gonna need, a wheelchair soon, sooner rather than later? And, obviously, you don't have the patient in front of you. So there's not a correct answer for that one, but just kind of keeping those things in the back mind, right? Patient and caregiver, education, for activity, pacing and positioning, that's huge, again, monitoring vitals, and then really using palliative care. He probably does have more trouble breathing, and so he's might feel a bit more anxious and so he might even need a little mental health, if he's having anxiety, which is about how things are going, and then again, using the ALS Association. So let's say you do order the patient some equipment for home, especially things like wheelchairs, it takes them a long time to get to the patient, especially the custom power chairs. Sometimes they can be expedited, and by expedited, it still takes eight weeks. So the ALS associations, especially the local chapters can be really great on, giving the patient like temporary equipment that they can borrow. So walkers, wheelchairs, things like that from their long closet sometimes, the muscular dystrophy associations in the area can also be helpful with that. Okay. So we have a little bit of time left. Do you guys want to do questions, or do you guys want to do the second case study? Okay, so it looks like the case study. Okay, so let's go to the second case study. Okay, so this one is a 55 year old female, two year history of low back pain, right foot drop. They thought the low back pain and foot drop are related. So she underwent spine surgery, she had lumbar laminectomy and a fusion. While she was at rehab, she sustained a fall where she had her right ankle fracture, right wrist fracture, she went to a sniff at that point where she had worsening weakness, more atrophy even though she was doing her her daily sniff activities with the rehab team.

So at that point, the team was kind of at a loss that she just decondition because she's, been kind of immobilized for this one period of time, or is there something else going on? Eventually she was diagnosed with a limb onset ALS, which is actually this presentation is actually very common. I will see multiple patients like this probably every month where they've undergone some sort of orthopedic surgery when the probably her back pain and had a foot drop or related to ALS. But again, it's very complicated. It could very well be that she had some sort of impingement and she could be weaker from being just immobilized, right? Easy to miss. So she is primarily wheelchair or bed bound at home. She's now been hospitalized due to repeat falls and altered mental status. Upon admission to the hospital. She was diagnosed with a UTI and she is also a full code. Right? So when you do your PT eval, she is oriented to person, place and time. Her mental status is back to baseline now that she's undergone some treatments, her speech and swallow reportedly intact for your chart review when you do the her strength testing her arms are significantly weak, trace to zero, that should be zero out of five throughout and she's got sublux on both shoulders and her legs are also pretty weak, three minutes at best but Dorsey function on both sides is wanted one to two, her neck is also weak. So she's about a three minus in her cervical extensors which means she probably has pretty significant head drop, especially in that part position. And then she's got very visible for circulations throughout all extremities and her trunk. She's got two beat of clonus in both of her ankles as well and a little bit of extension tone in both of her legs. So she's got that

classic kind of like significant weakness and atrophy, that's the lower motor neuroscience, but she's got the clonus and the tone that's the upper motor neuron signs. Okay, so she's in the hospital bed also had a beds up pretty high. She got some orthopnea, what she did is any other shortness of breath in bed, she's pretty dependent for rolling, which would expect because of the significant extremity weakness, as well as the neck weakness. Sit to stand as max assist. And as soon as she stands up, she goes straight into that kind of increase lumbar lordosis posture. Okay, she walks with her husband, so he'll basically lift her up and then they walk about 10 feet might assist for balance. He can just hold on to her arms and she could have just slide your feet along the floor. So takes a real long time for inefficient, but they do it that's how they get around the house. But her balance overall is pretty poor for sitting in standing, right? So you can probably see that she's got significant weakness, her mobility requires a significant amount of effort. And with her balance being so poor and her strength being so limited, probably also was related to her falls on top of having maybe an infection, right. Okay, so what should the PT recommend for safety during the hospitalization? Yeah, make sure she can call for help, right?

Okay. Hola for transfers, especially with nursing. Right? Positioning is huge, right? Lots and lots of positioning. Right. So typical color mattress, right? So lots of good suggestions there. So, looking at an air mattress to limit the skin right and especially she's gonna be in bed a lot. You something like a UTI you don't anticipate they're gonna be in the hospital for a long period of time. So, things like being able to sit on the edge of the bed probably not a real high priority, but definitely want to make sure that if they are getting out of bed to use a mechanical lift he's into verse and assist for nursing for all care basically. Then using the alternative call light. So you guys had, all the important factors there. Okay. So, besides physical therapy, nursing, what other disciplines might the patient need while in the hospital? So I think somebody already commented let me scroll through here. So someone else already said, nutrition and speech RT, OT. I'm seeing in the comments here. Social work, right? So, physically everybody, right? She's a little bit of everybody. So, respiratory therapy, looking, she needed for their lung tests, or pulmonary function tests, speech therapy for swallow assessments, palliative of care, social work, discharge planning, for sure. Could do OT for, slings or bracing, ADL modifications or caregiver training as well. Okay. So patient a family plan on returning home what might be considered upon discharge? Home health, wheelchair. It's a lost of home health and wheelchair, specialty beds, right? Okay. So yeah so home health therapies, really educating them on the functionality of the emulation at home. So the walking the walk, right? It's not really safe takes a lot of energy and effort to kind of educating them on, the pros and cons of each of those kinds of things. As a walking efficient enough to make it worth a while, is it worth the risk of falling or injury to the patient and the caregiver, right? And then looking at hospital bed, if they're needed a wheelchair, they probably need a mechanical lifts at home if you can do that training for the mechanical lift before they get home that would be super important and then putting them out there for sources for the ALS Association for equipment needs or just resources of support. Okay. So, in summary, ALS is a progressive neuromuscular disorder with mixed upper and lower motor neuron signs.

They can have more of a bulbar onset versus a limb onset. There is no cure. But the treatment is mostly palliative symptom based, really focused on the patient and their comfort and their safety, right? They can end up in the hospital for any number of reasons but usually falls, complications of the to feed, respiratory distress, dehydration, things like that. Physical therapy has a huge role in the hospital but as well as out of the hospital, we're looking at mobility, assessing the recommending exercise and activity modifications. Looking at equipment needs maximizing function but also decreasing the fall risk, managing pain, doing the character returning and maximizing the patient's quality of life. We need to definitely consider that we've got a whole team, we have a lot of people that maybe we don't work with on a daily basis for all the rest of our patients, especially in the Acute Care setting. But definitely trying to make sure that we, look at all their recommendations and if they haven't seen some of these disciplines, maybe getting them kind of hooked in to at least get established. In the hospital, definitely focusing on energy conservation. If we put the patient into that high fatigue zone, that will definitely increase their shortness of breath, their anxiety, right? There falls, we don't want to do that. Making sure that they're safe, that we're decreasing their fall risk that they have some way to communicate that they have a call light. Do they need a communication board, communicating with the rest of the team of how to communicate with them, looking at their breathing 'cause nobody likes to feel like they're suffocating, right? They're really gasping for air. Making sure that patients comfortable looking for equipments, training the family on, how to help the patient when we're not there, but also, what are they gonna do when the patient goes home? And then any recommended referrals or follow ups after discharge, okay? As far as resources go, for me personally, I would I work the ALS clinic in Sacramento here we do rely heavily on the ALS Association. So we rely on the local chapter, which is a great resource for us. But then also looking at the National chapter. So if you can figure out which ALS Association is nearest to you really getting established from them, we assume that the patient's already kind of established but that may not always be the case. If there is an ALS Association certified Treatment Center of Excellence near you, that might be also a place to direct the patient if they need more follow up care, looking for multidisciplinary clinics where they have access to the whole team most of the time, right? Local support groups. A lot of times there's patient specific ones or caregivers specific ones. So for both sides of the line, and then also, the Steve Gleason Foundation is a huge resource that I like to use. Questions. So let's see here. Let's see here. Oh, I lost some of these here. Is Frontotemporal Dementia--

- [Calista] Dr. Liu.

- [Jennifer] Oh, yeah, hello.

- [Calista] That's fine. I was gonna go ahead and start.

- [Jennifer] Yeah.

- [Calista] Is Frontotemporal Dementia ever seen as a first symptom?

- [Jennifer] I think so. We have definitely... I mean, I've been to different conferences and we've talked about this, where sometimes patients seem to have some onset of cognitive changes, and maybe there's also like motor changes, but maybe they're just more mild or it's not the primary concern, and then later they get the diagnosis. So yeah, sometimes the cognitive changes do come first.

- [Calista] Okay. And then our next question is, are there any contraindications of EIS or modalities to ease pain or cramping?

- [Jennifer] No, not really. It's usually whatever the patient likes better. But I've used EIS, I've used TENS for them for pain, and they do pretty well with that. If you use taping, just be really careful because sometimes their skin is just really fragile or more prone to break down if they're not very mobile.

- [Calista] Okay, and then this goes back to the ankle braces that were pictured.

- [Jennifer] Yeah I see here.

- [Calista] Somebody wanted to know what the name of the second ankle brace was?

- [Jennifer] Let me see. I'll click that through all of this. No that's too far oh, no. Let's keep going, I clicked it too many times. Stop. Hey, I got a little excited. Seem to be all back to the beginning. Calista wait to just look at the slides and just click on them. CEU. So you're talking about, this one? This one, it's like a... There's different names for it. It's like an easy up or something. It's just an elastic band that goes here. And then it attaches at the top of the ankle here. It's like a strap and then down at the shoelaces here by thing is called an easy up. And then this one here is a brand of it is ASO but there's lots of other brands. But a lot of the doctors do recommend, like always brace like this one here. Does that help?

- [Calista] Yes, I believe so. And then the next question is Cheryl wanted to know if there's a correlation with Lyme disease in ALS?

- [Jennifer] I have no idea. Sorry.

- [Calista] Okay. Let's move on here. Do breathing exercises such as using, I believe that's the incentives parameter, pursed lips breathing, coughing exercises, help keep a person's breathing independently longer, and if so, how much?

- [Jennifer] It can help we do some incentive parameter incentive parameter work. Faster breathing. All will you stop breathing, we're just taking progressively like deeper breaths. It does improve their ability to kind of breathe. But I don't know. Like, if it slows the decline per se, or it just makes it easier to breathe in that way.

- [Calista] We have a question about using Russian for muscle contraction.

- [Jennifer] I don't use it just because it's painful. They're already pretty uncomfortable. So I try not to put them in more pain than they're already in. Like if you're looking for, like E Stim or TENS works just fine.

- [Calista] Alright, our next question is regarding a quiz question number seven. It's asking can you click question number seven during your presentation, you mentioned using the borg scale to determine how hard to work with a patient? Question seven is states what should be considered when determining how hard a patient is working? A, is maximum number of reps the patient can tolerate, regardless of quality. B, the patient's willingness to participate. C, RPE, pain and vitals and D, EKG.

- [Jennifer] So, the borg scale is a ray of perceived exertion. So RPE is like the abbreviation for that. So the burg scale is looking at the RPE. If that helps?

- [Calista] Yeah. All right and that was our last question. So we're gonna wrap up today. And thank you, everyone for attending is there everything else that you would like to leave us with Dr. Liu before I go ahead and close out today's course?

- [Jennifer] I think that's it. If you have any questions, I think my email is in the PowerPoint somewhere. So you can just shoot me an email as well.

- [Calista] Wonderful. Well, have a great day everyone and hope to see you back in the classroom as we continue our Acute Care Conference.