

And now without further ado, I would like to turn it over to Dr. Robeck. Thank you so much. I want to outline the plan for the afternoon. It's a long afternoon and I really want to make sure we get enough breaks. The presentations will be about 45 minutes long and include time for discussion. We will then take 15-minute breaks in between each session. Giving people a chance to catch their breath and do what they need. In some ways this may also mirror the fact that when we see patients with long-term COVID, they will need frequent breaks as well and while we know there's a lot to cover it can only be done in bite-size pieces. We will get started. The point of this is really to ask more questions than we have answers to. I encourage everybody to chat questions, comments, anything they want to talk about when it comes down to discussion.

We will start with an overview. I have nothing to disclose. The views expressed are solely my own and mostly a review of the literature as I found it. We are going to discuss - - I'm hearing an echo. Let's see if I can figure this out. The case will be the same case. We will use each presentation as a way to approach a different aspect of the case.

Here is our case. You will be seeing it again and again. A 42-year-old female E8 comes into the emergency room feeling fatigued, having arm and leg pain a slight cough and overall weakness. She's put on bed rest with a prescription for ibuprofen. She returns three days later with shortness of breath, fever 103, chills, bodily pains, and extreme fatigue. She tests positive for COVID and is hospitalized in the ICU where her fever eventually goes to 104. She was medicated and intubated, and her family was not able to visit her.

After three weeks she is discharged home. Though her memory of the entire hospital stay is very cloudy, she remembers being frightened. Her loss of specific memory is very intimidating to her. Upon returning home she remains with fatigue, shortness of breath, G.I. disruptions, bodily pain, and difficulty sleeping because of nightmares. She is frustrated by her symptoms and her inability to return to work because of mental cloudiness and labile emotions.

She claims frequently about her symptoms and at her outpatient primary business. Her physician refers her to other clinics each giving her the response you will get better. She's also referred to behavioral health to deal with her nightmares. She reports feeling stressed and abandoned. Her primary care physician is in frustration suggested to the patient she might be embellishing in order to avoid returning to work.

Let's talk a little bit about long-term COVID. Many of us are frequently going to start to see patients with long-term COVID. Whether we are in pain clinics, and those patients are presenting with pain, or in primary care surroundings or just about every specialty. These patients are going to present. We need to be part of the solution for them. By the time patients with long-term COVID present they are PCR negative. They may present at week 12 or longer. With fatigue, marked decline in quality of life, weakness, pain, shortness of breath, cough, some may require persistent oxygen requirements. Mental health concerns including anxiety, depression, sleep problems, PTSD, brain fog they are describing. Headaches. Palpitations, chest pain. Perhaps evidence of [Indiscernible]

disease and now we are starting to see more and more post COVID chronic kidney disease. It may present with hair loss.

Let's talk about the ubiquity of symptoms. And what we need to be thinking about when we see patients who we have been following all along in primary care or for chronic pain who are not doing well. Or patients who present to us de novo. Obviously, we know that pulmonary disease is a hallmark of severe COVID in unvaccinated individuals who get ill before being vaccinated. They will show shortness of breath, problems with exercise capacity through hypoxia. We are starting to see evidence of reduced diffusion capacity and pulmonary physiology. Persisted capacities and fiber changes in their lungs. And how do we assess them? I want to talk about ways that we may be able to functionally assess people but want to throw out some tests that are repeatedly appearing in the literature. When you read the literature, you can understand what these tests are, and how they are using this marker of disability and functional improvement after treatment. Or during treatment. Assessment and progression recovery of pulmonary disease they include [Indiscernible] talk symmetry.

Everyone knows they need to have a home pulse oximeter. There are six-minute walking test. High resolution CT scanning, PFTs. Some people may need pulmonary angiography. There are many things we can do without imaging that can help us to assess the situation. We will talk more about some of those things.

I want to talk about the six-minute walk test. It may be something you want to start to use in some of the patients to get a sense of what the objective functional capacity is. But also, to let you know that you will start to see the six-minute walk test discussed more and more and more in the literature related to long-term COVID. This is what you need. A straight corridor, a countdown timer, stopwatch or obviously, your smart phone. You need to have a lap counter. You can have cones are some way to mark turnaround points. Oxygen source if you need it. Blood pressure, for patients severely ill you may want to have a crash cart. The patient has a pulse oximeter with a clip. And the patient needs to tell you the dyspnea and the rate of perceived fatigue. You ask the patient to wear comfortable shoes and clothing and if they need walking aids. No vigorous exercise or warm-up is required. The patients should sit and rest in a chair located near the starting point for 10 minutes before the test starts and during that time they check for contraindications and pulse and blood pressure and make sure clothing and shoes are appropriate. Pulse oximetry is optional, but I highly recommended. Have the patient stand and rate their baseline dyspnea and overall fatigue using this [Indiscernible] scale. Let the patient know you want them to walk as far as possible for six minutes. Back and forth in the hallway. If they need to take a break, clearly, they can take a break, slow down or stop and rest if needed. They can lean against the wall, but they should resume walking as soon as they are able. They should pivot briskly around the cones and continue the other way without hesitation. And you can demonstrate that. Keep track of the number of laps and remember the object is to walk as far as possible but don't run or jog and don't continue if you feel it is unsafe. Just let them go without talking if you can help it. Encourage them if you need to. Keep track of the laps.

Let the patient know how much time they have to go. If the patient stops walking, tell them they can lean against the wall and they can continue when they feel like it. If the patient stops before the six minutes are up and cannot continue take the patient to a chair, sit down, and discontinue to walk and record that. Do it and that I will tell you to stop and when the timer buzzes have the patient stop walking and record the posttest vital signs. The number of laps, the distance covered, and congratulate the patient on a good effort and offer water. This is the scale. Perceived exertion goes from zero to those very severe. The rate of perceived exertion from zero to a maximum exertion.

Why do I want people to understand that? Number one it is a possible test we can use to quantify progress. You will also see throughout the literature the six-minute walk test used to describe patients' ability and response to treatment. Additional problems with breathlessness we are starting to see [Indiscernible] event. Although rarer than we once thought in post-acute COVID, it's still a consideration in patients who are doing worse than we would expect. For patients in whom we are concerned about from Bolick events we want to do testing with [Indiscernible] and other appropriate testing as they may be candidates for anticoagulant therapy and also improved with treatment.

Cardiovascular disease has persistent symptomatology. Once again, we include palpitations, dyspnea, and chest pain. Long-term may include increased cardio metabolic demand.

[ No Audio ]

We do see in our patients these cardiovascular problems. We want to work in conjunction to our light cardiac plan that goes hand-in-hand. Patients with acute infection those experiencing persistent cardiac symptoms can be monitored [ No Audio ] and there are smart phones that can do EKG monitoring if we are concerned about arrhythmias.

We are seeing many neuropsychiatric problems including myalgia, headache, and causes that also are really critical. As we take care of patients with chronic pain. We are seeing anxiety and depression and sleep depression and PTSD in a significant number of survivors. The pathophysiology of this really is very complex. We want to be able to slowly but surely address all of it. Sometimes it feels like lifting 1000-pound weight. The patient will describe it in that way. And what we really need to be doing is lifting 1000 pounds, one pound at a time. We need to be able to reassure our patients that while it feels overwhelmingly complex, we can slowly break this down into bite sized pieces so that we can start to see some improvement rather than feel overwhelmed by trying to take care of everything all at once.

Pain symptoms are ubiquitous in this patient population. They may be presenting to our clinic with pain symptoms. We are seeing chronic malaise and acute myalgia and mental health symptoms and sleep symptoms that complicate pain. Many patients are presenting with migraine like headaches and in fact in the follow-up study of 100 patients almost 40% had ongoing headache after 6 weeks. We are seeing a reactive arthritis in some patients and fibromyalgia like symptoms in a large number of patients and symptoms suggestive of a connective tissue disease. More and more we are starting to see concerns about prolonged renal damage and

renal dysfunction. Most patients will see resolution of the severe acute kidney damage. We are now starting to see reports of more kinds of residual COVID associated nephropathy in patients. It's thought to be due to acute tubular injury and a response to [Indiscernible] chemo kind activation. We need to keep an eye on renal function. Once again, we have to coordinate care if other specialty help is needed.

Endocrine dysfunction including increased risk of diabetes, thyroid disease, bone demineralization are all things to be on the lookout for. We want to make sure we continue to monitor these as we follow these patients over the next month. We are seeing increased G.I. irritability and also [Indiscernible] hair loss in approximately 20% of survivors.

A lot of miscellaneous symptoms and weight loss will be important. It may also interfere with our ability to put together an exercise program. Vitamin D deficiencies. [Indiscernible] Pain syndrome we talked about and worsening of previous comorbid conditions.

It's important we tried to get a physical exam at some point. Much of our care is really going to be done through a virtual format. It's difficult to bring them back-and-forth into the clinic. While we do have them, and we do have the opportunity for physical exam. We want to may be able to understand what the vital signs are. They can include pulse ox, BMI we want to have the ability to do the ambulatory pulse ox. Especially for those presenting with respiratory systems. Now it's more important to think about orthostatic vital signs. Patients may have nonspecific systems of being tired and fatigued and not able to walk and problems with exercise. When in fact the problem is related to a [Indiscernible] drop in blood pressure. Have the patient lie down for five minutes. Have them stand and repeat it after standing at one and three minutes and noticed that a significant drop in diastolic blood pressure is considered 20 milligrams and a diastolic 10 millimeters of mercury. To monitor for symptoms of lightheaded and dizziness associated with standing. So, remember 5 to 20% of patients will have symptoms lasting over four weeks. Those that are hospitalized especially with severe ICU related illness will have a higher percentage who have develop difficulty. While the number of symptoms can be fairly large and can impact just about every organ system in the body.

The ICD-9 codes for how you code this is starting to become clearer. And we also need to talk to people about vaccines. There's a subset of people that will notice significant benefit after vaccination. But in addition, we are finding out that native infection alone is not necessarily going to protect people from reinfection. Our best bet is to vaccinate people when it is most appropriate. Let's think about how we have a conversation about vaccines. We need to listen with empathy. We need to use motivational interviews. Ask open-ended questions to explore concerns. Ask permission to share information but even if the patient is unwilling initially to have this information shared, be persistent. Be persistent about making sure the patient understands when the time is right, we want to make sure that we can offer information for their own protection and the protection of their family. Find out what reason they may have to be vaccinated. Is it to protect the family member? A parent? A close friend? What would motivate them to be vaccinated? Once they are in

agreement, if they have not been vaccinated, helped make that vaccination happen right then and there or as soon as possible.

We do know and this is important information that the vaccine did improve prolonged COVID symptoms in a subset of patients. This one study as many as 30 to 40% of those who got the vaccine reported improvements in the symptoms. Some of them dramatic. It's important for people to understand that this vaccine may still help people who have already been ill. In terms of their symptomatology as well as preventing the risk of a repeat infection.

There are a number of post COVID functional status scales. We want to be able to figure out what it is we - - the patient is able to do. The scales range anywhere from the ability to live alone or do anything. Duties which they - - duties they are able to do or not able to do. Able to function but still not feeling well. We are - - where do they stand in terms of functional status? This is an easy questionnaire. I have no limitations. I have negligible limitations. I have limitations. I only occasionally need help. I have more significant limitations. I am completely disabled. We want to know where things stand.

Also let's remember the impact on the family. We now know the family functioning during this pandemic has been extremely hard-hit. And frequently the patient's inability to function can be exacerbated by family stressors and vice a versa. Let's not forget about asking what is happening quite other things we can do to improve the family situation. Can we be able to talk and educate through telehealth? We know mothers and families with lower-level incomes are particularly at high risk. We need to want to create a holistic approach that includes not only a patient but the inpatients entire environment.

What about the risk for chronic pain? This is about COVID and chronic pain. Where the risk factors for people developing chronic pain with COVID? There's ICU related risk. There's the substance use burden. Psychosocial risk factors. If they've used prescription opioids, or illicit opioids, they are at higher risk for developing chronic pain.

Let's go back to our case. What we want to do with this first discussion for the next 15 or 20 minutes is talk about how do we start with this patient? How do we begin a conversation? How do we respect the complexity without overwhelming the patient? How do we just begin? The 42-year-old female, E8 comes to the emergency room feeling fatigued with arm and leg pain, slight cough, weakness. She's put to bed rest with a prescription for ibuprofen. She returns three days later with shortness of breath and under -- 103 fever and body pain and extreme fatigue. She tests positive and is hospitalized and her fever initially goes to 104. She was medicated and intubated, and her family was not able to visit her. After three weeks she is discharged home. Her memory of this is cloudy she remembers being frightened. Her loss of specific memory is very intimidating. Upon returning home she presents with fatigue and shortness of breath, G.I. disruption, bodily pain, and difficulty sleeping because of nightmares. She is frustrated by her symptoms and her inability to return to work because of mental cloudiness and labile emotion.

So, I don't know how we work the sound here but let's look at the chat and also, I will open it for questions on audio, video, and chat.

If people want to unmute their phones, we also found if you're having trouble with that, if you press pound 450 that works.

I see a question and let's begin with that question and let's really keep the conversation going. We will only solve these problems by not giving up and persevering and sharing ideas. I also think people who have worked with patients with chronic pain understand the dynamics more so than anyone else of breaking solutions down into small, achievable goals. That our patient driven that we can utilize to build on success.

The first question I see is, do you see any correlation between being intubated with PTSD symptoms more than covert infection? That's a fabulous, fabulous question. The answer is probably impacted by all of the above. Also keep in mind if you incubated in an ICU, are gravely ill is even more isolating than before COVID. We have the whole complexity of post-ICU syndrome which we will talk about during one of our sessions. Complicated by the impact of the pandemic from the individuals and the need for quarantine and the ongoing impact of the pandemic on the family while that patient is away from home.

Any other questions or comments people want to make? I think it's important for us to figure out how we really get started with a patient like this. This will not be a unique patient. How do patients suggest smart goals and how to achieve them through treatment? I think this is important. I think that one of the things that we as pain specialists can really teach those caring for patients with prolonged COVID, is how do we take the complexity of symptoms? How do we prioritize what the patient's goals are? This is really going to be important. We are better able to do this than many other providers.

The other thing I see that I know happens in pain care that may be happening even more is that the issue of setting goals may be something that we ask in the first session, but we don't get an answer to. We need to ask the patient think about what would you like to be the next thing you would like to accomplish? We want to do this as a process. What is the most important thing to you? What is the most important goal? The biggest issue is to help regain trust in the medical system. She has been poorly treated. This was a really important concept in my opinion. The patient out of frustration and lack of understanding has been given the impression that this is not a real problem. It is a real problem. We need to reassure the patient in a lot of ways in my mind. We need to let the patient know on the one hand we are learning a lot about this disease process. We have a lot to go. We have a lot of things we have to learn. We have learned a lot. And not every physician has been able to keep up with everything while they have been caring for patients. It's an incredible challenge. The good news is that patients with the clinician who is beginning to understand this process. We need to reinforce you are here now and understand this is a complex process that we need to reinstate hope.

We are starting to see people get better. The more we learn, the more we can help people further. We want to make sure we instill hope while respecting the complexity. Be thorough but we can't do everything at once. Figure out where we are going based upon what that patient needs are and their priorities are and what their resources are, what's going on in their environment. I think a lot of our patients come to us with frustrations of how they are not being heard. Pre-COVID and now it's increase. I think that's absolutely right. So how do we compensate for that? I think in many ways we are just starting to leverage telehealth in a way that can allow for shorter and more succinct and yet greater ability to hear what's going on in a day-to-day basis. I know with high-risk chronic pain patients this is in between the visits where we can make a phone call or have a telehealth visit were invaluable. I wonder whether or not with COVID patients the institution of really having telehealth follow-up can make a huge difference. So much can happen when that patient walks out the door. What happens when they think about what is inside? What happens when they are home unable to talk to their family? Feeling a little less overwhelmed than in the clinic visit. I think the opportunity for telehealth, the opportunity for team telehealth enables us to really listen to what is going on and understand how it is evolving. These are fabulous, fabulous points. Any other points are comments or things people want to say or do or start with, with this patient?

Let's go back to the case as I'm waiting for people. One of the things that strikes me here is this interplay between fatigue and memory. And throw out an idea and let me hear what people think. One of the things that we have learned over the years caring for patients with pain and TBI is that they clearly had structured ways in which we can utilize resources to improve function. Improve function begets improved function. So, for example, how can we then perhaps happen to our TBI specialists or even the patient's children. How can we best use things like their smart phone to help them remember thanks. That's what they are all using anyway. How do we tap that memory system so there's mental clouding on while we are waiting for it to come back and perhaps doing some cognitive rehab that we can at least get them to improve function? I throw that out there. As one consideration. Lifestyle change is important. Those lifestyle changes may need to be in bite-size pieces.

For example, we need to know that being sedentary is one of the worst things for someone with chronic pain. We also know that for somebody with post COVID, walking half an hour may not be possible initially. How do we break that down? How do we then be able to reassure the patient may be perhaps through some testing that rather than think about half an hour walk think about a five-minute walk or multiple one-minute walks? How do we get them back into shape very slowly if they are unable to get into a rehab situation just like we used to think about? Do we work with our rehab specialist? We will need to pull in the rehab specialists where they can then tailor make for us rehab programs which takes the place of rehab even more slowly but persistently. Those are things I think we need to start thinking about. Once again, I think that we can develop all sorts of educational programs through telehealth videos and review what's now available that we can share with our patients. And so how do we handle emotional inability? Can we address what's going on? What else

is happening in the family? Let's look at everything one by one and explained to the patient it seems like the situation seems overwhelming but let's figure out what we can fix. It's been our experience in complex situations like this that fixing one thing at a time tends have other things fall into place. Really keeping an open mind that everything she has is fair game. It's important for us to look at all of our resources to do that.

Kristin says how much of this would be social work versus primary care? I think this is truly interdisciplinary. I think that should we ask the social worker to be seeing all of these patients as a matter of course? I think in many ways if we have the ability to do that, we can create a virtual console. There may be ways for them to understand what's going on better than we can ourselves. As physicians or other professionals. It may very well that you give social work solutions are the missing link. And I think that it would be important whenever possible that we take this matter-of-factly. A lot of people have specific needs that are not being met right now. I do think that would be a very helpful way to integrate some of that here. I think it would be really extremely helpful. Just the ability to say we know that you are having problems. We know that there are some solutions to the problem. We know that might not happen and we also know that we have ways to make progress. It goes a long way to getting the patient to trust us again and also to find out ways that they are able to be able to take care of themselves again.

Fabulous chat. Any other questions or comments or anything people want to comment about where to go right now with this patient? Let's look at this pain. How do we handle the pain? We don't want to overdo it with medication. We want to be able to respect the fact that she is having pain and address it in ways perhaps non-pharmacologically that they can improve how she's feeling.

Shortness of breath. Yes. Let's assess shortness of breath. Let's make sure this patient has a pulse ox at home that way if the patient says I can't do this, because I'm short of breath, and in fact we document that she is short of breath and her pulse ox stops we can get her involved with pulmonary rehab. We can get pulmonary to help us. If in fact she feels short of breath and the pulse ox is good, that may very well be due to more muscular atrophy and once again we are looking at it in a very different way. We may be able to have that resumption of activity with slow increases, five minutes at a time program without worrying about becoming hypoxic. So, assess shortness of breath and we will talk about things to do that in the next session. And that is important. I would first look at the physiology from the bottom up. Beginning with regulation and mind-body skills. I'm late to the party and is she engaged with behavioral health support? Even the PTMHE. And yes absolutely. Take it matter-of-factly. Everyone in this situation needs this comprehensive approach. Let's put the team together for you and let's bring the team to you with whatever telehealth support we can. And this will be give-and-take. We will hear what your needs are. It will require self-care on your part and us providing the resources for you. Let's do it and do it together. And once again I cannot over emphasize the importance of offering hope.



I was the lead in a post-appointment clinic. In 2008 and 2009. One thing we did was every single person walking into that clinic was everyone got some mental health evaluation test. I had patients says I don't need it I'm doing okay. My response was you know everyone needs a way to come back. You were going and everyone needs a way to come back. If you don't need it that's fine. Just let us know how you are doing and why you are doing well so we can share with others. This is just matter of fact. And it enables people nonjudgmentally to get the help they need. We also need to say that with people post COVID. Everyone needs the full assessment and then we can decide from there where people go.

I know the imagery was shown to reduce the rate of apathy. I've used heart rate variability training and strategies to help really important TBI patients to exercise long even at low levels. Our job is to always foster hope. I agree. It's not that there's not necessarily a rehab approach it's that we need to [Indiscernible].

I could also see her getting overwhelmed by the possibility of so many different medical appointments. I'd like to suggest many different providers at the same time. I completely agree. And that way we can sort of tailor make what her needs are in order to be able to see who she needs to see when and then what telehealth enables us to do is educate her family. Perhaps her family is very frustrated and feels like that primary care provider. How do we use the telehealth approach with patient permission to do a little bit of family education as well?

I see in the chat [Indiscernible] question about what about long term COVID and people vaccinated [Indiscernible] that people who get breakthrough COVID who are vaccinated, a far less chance of getting COVID symptoms. [Indiscernible] So, this issue - - so glad you asked that question. Another reason to get vaccinated. If you get a breakthrough infection you are less likely to require hospitalization, you are less likely to die, you are less likely to need ICU care, and you are less likely to get long term COVID, and you are more likely to not get sick at all especially if you are younger. Really important point to make two people about vaccination.

We are now on assessment tools. What happens when you see a patient like this? How do we understand assessment tools without overwhelming a patient?

That's really the key. Over time there are certain things we will want to understand about this patient. We really don't want to overwhelm her. Let's talk about the assessment tools that the literature is reviewing. There are three reasons I want people to talk about assessment tools. Number one, understand which ones you will utilize. Which ones you will think about using in some individuals and the timing of it. In addition, the assessment tools are being utilized to describe medical interventions throughout the literature. So, understand that. And number three, even if you don't use these assessment tools look at what the assessment tools are trying to figure out. So that within your own clinic with your own patients you can figure out what are the symptoms I need to know about? Remember this is our case. The same case. It's important throughout the entire four hours.

A 42-year-old female develops COVID. Winds up in the ICU, she is intubated and survives. She's very isolated. And now has clearly long-term symptomatology that is debilitating to her. Right now, until she sees us, people on this call, she has been really given frustration with the medical system. Now because we are learning about long-term Covid and its impact on all patients, we are where the buck stops. We are where I can say I understand what's going on, this is not hopeless. It will require step by step. We need to know what the priorities are. We need to put pieces into place, and we will start to work.

What is long-term COVID? Symptomatology that lasts more than six weeks. And we've seen all sorts of definitions. When we start to see patients who do not improve at four weeks, six weeks, that is what we are starting to see long-term COVID.

One thing that is important is explaining COVID testing to patients. What is COVID testing? Why are we testing? What we do with COVID testing is the virus enters the body, the patient may or may not have symptoms, and the specialized system helps fight infection by producing antibodies that match up to the invading viral antigen which is a unique feature of the virus. When it's overprotective antibodies can remain in the body to fight future infection. However, antibody testing can frequently be misleading and helpful. We want to make sure people understand if we measure an antibody that says it's positive it doesn't tell us if we are immune or if you actually had COVID. It doesn't tell us as much as we would like. So, the main test we are using is PCR testing. So, swabs in the nose and throat use the lab test to identify SARS-CoV-2 genetic material. It tells us who has an infection but nothing about the immune response. During the active infection with the viruses in the body, even if a person has no symptoms, you will be positive. This is our most accurate test. The only thing that can happen here is if the swab doesn't pick up enough virus or if the nose is swabbed incorrectly, you may get a false negative. Once it's positive it's very accurate.

Antigen testing is not as accurate. It's frequently being used to travel but they need to understand antigen testing is not as accurate. And serological testing doesn't always give us the information we need. The big test is molecular tests being done in terms of research but that's the main test we see when people are positive.

What about when patients present? What do we need to think about? If it hasn't been done recently even within the past few weeks think about getting blood count, electrolytes, or renal function. We know renal function can be significantly impaired. Live function. Think about inflammatory markers to see if there's information. We are starting to see thyroid related disease. So thyroid function. Vitamin D and Vitamin B12. These are basic laboratory tests to consider for patients with post COVID. And should be done at baseline for everybody and potentially repeated as symptoms or progress or lack thereof determined.

For patients who present with pain other rheumatologic factors may be present and antibodies rheumatoid factors other rheumatologic parameters I'm sorry [Indiscernible] if we are concerned about recurrent clotting

and acute recurrent myocardial injuries and if we are concerned that there may have been cardiac damage and problems with symptomatology related to cardiac dysfunction versus pulmonary dysfunction consider getting a B type natriuretic peptide.

There is a large number of functional status assessments. I will mention them so that you know them. When you're reading literature and see report you know what they are related to. You've got the promise reported outcomes measurement information system. You have the post COVID19 functional status scale. You've got the EQ five. These are all things that measure functional status. It's important for us to understand how the patient is functioning. We talked about this COVID status scale all the ways I can take care of myself to I am debilitated and need help at home. Here is the promise that a person centered measure that evaluates mental and social health in adults and children can be used in the general population with individuals living with chronic conditions in general.

The nice thing here is the computer adaptive tests allows for easy to use questionnaires to help improve communication between patient and clinician. It covers the full range of things that you want to talk about. Anger, anxiety, depression, fatigue, pain behavior and interference of physical function satisfaction with social activities and with social roles this is a nice general assessment tool to have our ability to utilize. There's also something called the EuroQol, and it measures five dimensions mobility, health care, usual activity, pain, and depression. Whether we use EuroQol or not, it's important for us to have a mechanism for understanding all of these. How mobile are they? Can they take care of themselves? What is a typical day like? What about pain and discomfort? How does that interfere with their ability to dysfunction? What are their mental health systems?

There's also a number of parameters to measure breathlessness. This is called the modified medical research Council. We don't need to use all of these, and we may not even use any of these but what will we do to monitor patients? This is I only get breathless with strenuous exercise all the way to number four I am too breathless to leave the house, or I am breathless when dressing. We need to be able to ask these questions. I get breathless and short of breath at ground level or walking up a slight hill. On level ground I walk slower as people of the same age I have to stop after walking about 100 yards. Where do our patients stand this will be an important way to assess if they are doing what we asked them to do.

There's a large and growing number of neurological assessments. The Montreal Cognitive Assessment test that we all know about Compass 31 helps us with this and we are starting to see more and more. These patients have [Indiscernible] where they get dizzy and lightheaded due to orthostatic pulse and blood pressure changes. There's also something called the neurobehavioral symptom inventory. It asks questions relating to feeling faint or dizzy after standing. It looks for skin changes to red or purple with change of position. Changes in sweating or skin dryness. Early satiety indicating G.I. dysfunction [Indiscernible]. Bowel or bladder dysfunction. There's a neurobehavioral system inventory where

people will give you symptoms anywhere from none to severe and everything in between. These are the things that it checks for. Feeling dizzy and loss of balance and poor coordination and comeliness and headaches and nausea and visual problems, hearing difficulty, sensitivity to noise and numbness or tingling in parts of the body, and change in taste or smell which is very common in these patients. Loss of appetite or increased appetite. Poor concentration. They can't pay attention. They are easily distracted. Forgetfulness can't remember things. Problems with decision-making, slow thinking and difficulty getting organized where nothing can get finished. Fatigue and loss of energy and getting tired easily and difficulty falling asleep or feeling anxious or tense or feeling depressed and sad. Irritability. Easily annoyed and worse frustration tolerance. Feeling easily overwhelmed.

We have a whole variety of mental health assessments we have used for many years. Once again, we do need to assess for anxiety and depression and PTSD and whatever way makes sense for the clinical findings. There's also an impact of events scale. Look at once again we've all been impacted by this pandemic whether we've had COVID or not. The family was impacted the patient was impacted. And so, this is a list of difficulties people sometimes have after stressful life events. And people are asked to have impact from not at all too extreme and once again there's this non-judgment which is okay. This is not an uncommon situation. People will react. We just need to understand the impact it has had on you.

So, a reminder of feelings about it and trouble with sleep and other things kept making me think about it and feeling irritable and angry, letting myself get upset when I thought it reminded me of these. I thought about it when I didn't mean to. I felt as if it hadn't happened pictures about it popped into my mind. I tried not to think about it. I was aware that I have a lot of feeling about, my feelings are numb. I find myself feeling like I was back at that time. I had trouble falling asleep. I have waves of strong feelings. All of us know that this looks familiar. It's a lot of the questions we ask about PTSD. We need to normalize that this is a common problem. There is no one better at treating PTSD than those of us in the military health care system and VA and we need to make sure we understand these are treatable symptoms. We need to make sure patients understand that and that we can then work with them to get them properly treated.

So important once again all the things we remind ourselves are part and parcel to PTSD that many people are feeling right now. We want to be able to utilize our treatment options as best we can.

There are other things people are utilizing. There is the wood metal fatigue inventory the fatigue severity index in insomnia severity index. The connective tissue disease screening questionnaire. I don't bring these up to have people spend their entire visit utilizing questionnaires. You will be seeing this in the literature as people are being assessed and also it brings up to us the questions, we want to make sure we ask patients to be able to respect the complexity of what they are experiencing.

The fatigue severity scale has a one through seven markers. And questions such as my motivation is lower when I am fatigued. Exercise brings on fatigue. I am easily fatigued. It impairs with my ability to function it causes frequent problems. I can't - - it prevents me from functioning and interferes with carrying out certain duties. It's one of my most disabling symptoms. This test I think I want people to think about even more carefully because this is throughout the literature. The exercise in the one-minute sit to stand test. This is potentially a way people can monitor how they are doing at home. So, the woman sits to stand and the 2-minute step test and the 10-minute walk test. We talked about the six-minute walk. There are different tests for exercise capacity.

I want to talk in more detail about the one-minute sit to stand. This is a test people can do at home. And it gives you information without having to bring the patient back into clinic. The results help see how people respond to treatment and what the baseline is. Wear loose comfortable clothing and sturdy nonslip shoes. Don't do the test if you are feeling unwell. Have a current infection or it's too hot. The patient will need a straight-backed chair which is the flat hard seat with no armrest. A stopwatch or timer and we all have that on our smart phone. Now's a good time to [Indiscernible] if you don't have one to make sure it's functioning. You placed the back of the chair against the wall to stop it from moving. Before you start measure your oxygen level and heart rate using the pulse oximeter. Measure breathlessness using the board breathlessness scale. Set a timer for one minute. Sit down in the chair and set your feet flat on the floor and put your hands on your hips and let them hang by your side to hold them loosely together. Stand up from the chair into your legs are completely straight making sure you do not use your hands or arms to help you. Then sit back down again, this counts as one sit to stand. Continue sitting up and down in chairs many times as you can in one minute. Rest for a few seconds if you need to and then carry it on if you can. Stop the test if you feel unwell, have chest pain, dizziness or severe breathlessness. When you finish it write down how many sit to stands are there and measure heart rate and oxygen levels and write down the results.

What is the BORG scale? It ranges from 0 to 10. When exercising you should aim for moderately breathless when exercising which is three or if you're too breathless to speak you may want to slow down or take a short rest. So, you will measure oxygen level, heart rate, and total number of sit to stands completed. So that enables you to see whether or not people are barely able to get up and down or they are doing pretty well initially and then if they are not doing well how to measure the progress. There's also balance and fall risk task that may be important for people who have difficulty with dizziness. There's the Nettie balance assessment tool done in the clinic. Patient is seated in a hard armless seated chair and asked the patient to attempt to rise without using their arms or hands. You can try to nudge the patient to see if they are likely to fall. Giving them support if they are. The gait assessment tool the patient walks across the room and see how the patient is doing. Ask the patient how they start and stop if they feel unsafe. Here's basically looking at fall issues. And we've done falls assessment on older patients using the therapist. This may be something we may want to do. Now in some of our younger patients who are feeling fairly dizzy

following COVID. There's a tilt table test for changes in heart rate assessment and once again we are reminded because the assessment is easy to do and should be done at least once. Where you measure the blood pressure lying and standing after three minutes and the differences [Indiscernible- Garbled Audio]

That is a brief discussion of some of the assessment tools. Perhaps some of the questions that we will want to ask this patient understanding what the assessment tools starting to be utilize in the literature provide us with. Now we have this patient here. We have been able to decide based upon the conversations from the last hour that we will reassure the patient that we understand the symptomatology is real. We have structured methods for assessing and following up. We would like to understand her motivation for her priorities for how she wants to start the process of rehab. We are going to then create a team that we will act as the coordinator for. We will act as this integrated team where we can provide her both at home telehealth care and in facility care when indicated. And see where we go from here. We talked about a variety of ways we can address symptomatology including her pain. That's where we left over from the last hour. So, let's use this as a chance to build on our discussion from the last hour and see where we go from here. Any thoughts? Comments? Questions? Ideas? About where we go from here with this patient?

I'm going to throw something out. That would be and this might be a good time to throw out how are things going at home? What is happening with your family? Who do you live with? This is especially critical at this time of the year. The answers to the questions are that she was living with her spouse who himself was trying to maintain full-time work. And she has a 10-year-old daughter who has recently started back to school and that has added to the stress. And that is added to her feelings of frustration because she feels like she cannot even help to get her daughter out the door to go to school. Let's bring in the family here and see what we can do to be able to understand some of the dynamics of home that may be compounding the problem. Any other thoughts or ideas?

We now understand that her current priority is getting her daughter taken care of at school. Her other priority is also making sure there is adequate documentation for work so that she can go back to work when she's ready to go back to work. We all know that her being able to function at work will improve her ability to take care of herself and that is also a priority from her. Being able to function at home and go back to work. Therefore, being able to reach out to family members and reach out to work supervisors and to be able to work together to improve those goals. It may very well be that this patient's ability to return to work full time is much further down the road than part-time. We might want to also find out is what is the capability of part-time work when she feels well enough to do it? Let's figure out how we define what each aspect of her life allows us to offer her. Let's figure out why she is unable to get out of bed enough to help her daughter go to work. It seems to me there are couple of things we immediately want to do. The first thing is go back to that lab work. She's not had any lab work since leaving the hospital. So, it would be very important to repeat some of that lab work including thyroid function and blood sugar and blood count and electrolytes and liver and kidney function. To me that would be a

given. Then the other consideration would be defining blood pressure the important part of our - - what we are doing here. Seeing what her symptoms are when she gets up. And then defining what happens when she tries to get her daughter ready for school. Any other questions people want to ask, or priorities other people have?

I'm not seeing anything in the chat. I don't know if it's possible for people to open up their phones. I hope people can hear me. Okay great.

Let's see if we can do something. The patient has left her office and you've done the blood work and now you've got a follow-up which you have arranged through virtual care. And lo and behold you have found out that she actually has developed hypothyroidism related to her post COVID. Now you have something that you can add to the [Indiscernible] related to the kind of things you can do to help her. So while we understand that treating her hypothyroidism is not necessarily the only thing you will do you now have something to offer her. You have found out that during the course of her post COVID time that she has developed an underactive thyroid and we can start the process of treating it. You can think about ways we can better define how she can then start improving her ability to function. Let's talk about obviously that treatment and we will start low and go slow. We don't want to overdo it. We want to reassure her that can make a huge difference in terms of her sleep and mood. Also, it may very well be if we can get her to do that sit to stand test at home, we have a better sense of what the exercise capacity is at home. And while not pushing it that at least we can be reassuring to her and can help us understand what her limitations are. So, we will get her hypothyroidism treated and we will slowly improve her ability to function. If she feels like she can't function that she can't stand for very long, what are the things that she can do at home to do things without standing and what things can we do? Can we get chairs at the countertop et cetera? How can we problem solve in order for ways to improve function with her current degree of symptomatology. The other thing I think it's definitely worth thinking about for someone who's been on a ventilator is calling in our pulmonary colleagues and see whether or not a pulmonary assessment might be helpful. Or whether or not some type of pulmonary rehab done at home might be helpful. We will talk about post ICU care. Remember this one was on a ventilator, and she's got very weak pulmonary musculature from the disability. Do we have any post ICU rehab programs? I think that's something to think about. As well. Any other thoughts or ideas?

How about also trying to get a little help with colleagues together to talk about how to work with the family. Perhaps getting a telehealth visit with her and her husband to do some strategizing about how they get through the next few months. Some strategizing about how they are going to improve their ability to get through the school year. It's very important for that family to be working together as a unit to be able to improve her ability to function. Any other thoughts or comments about some of these evaluations that enable us to standardize some of the ways in which we will follow patients?

Maybe check PTH as the thyroid imbalance could be the result of the intubation and damage the recurrent laryngeal nerve. Yes, certainly. I

would think anything that really puts to bed our concerns about underlying medical issues that need treatment. In terms of treating what needs to be treated and reassuring what it does not need to be treated. Looks like for her the biggest problem for her post intubation is the general deconditioning of the past few months. Now coupled with her thyroid problem and her feeling so overwhelmed that she doesn't know which way to turn and also that period of time of disbelief by the healthcare provider who really did not understand long-term COVID. So, trying to put that together can be really helpful.

Are there some specialty services that can be gauged thinking about outside the box telehealth pulmonary? I think that's a very important thing. We now know there are healthcare teams evolving to the long-term COVID. Many areas there are now post COVID clinics. It may be helpful to find one that you are functioning in. I think there are some post COVID clinics. While I don't think that someone being sent to post COVID clinics and having them take care of everything is the answer, certainly some of their insights can be extremely helpful to us. So are their local clinics and once again I think most post COVID clinics are understanding that with what needs to get done a lot of it's being done through telehealth. If you can work in conjunction with this, that will be helpful. All of our rehab needs to be thinking about how we rehab post COVID patients. Cardiac rehab and pulmonary rehab and physical medicine rehab.

And we also know that thinking about rehabbing actually improves the ability to rehab. Even before people [Indiscernible- Garbled Audio] as we want them to, really understanding and thinking through the process is important. We do know there are these post COVID clinics that are thinking outside the box. There may be people within the facilities that are starting to think outside the box themselves and they want to communicate with them. We want to be able to talk to them and have a conversation about the patient we are sending. What we don't want to have happen is for someone to show up and then give a standard protocol and have the patient unable to [Indiscernible]. We want to keep up that communication with the people that are making referrals and I cannot over emphasize I think the role telehealth will play. It will be really lifesaving for not only our patients but also the health care system to be able to catch up with patients [Indiscernible] and see what's happening in between the visit. Find out what is working. Find out what is not working. So that patients can feel that they are not abandoned. To cheerlead every success. There may be successes we need to cheerlead that used to be day today life before and now it is a true success. And to problem solve the things that are not working. With a patient and the patient's family. Those are the kinds of ways we can start to put the pieces together for patients like this.

Any other last comments before we take another break. I will give you a little bit longer break. People seem to be quiet during this hour.

Our next two topics will be - - the next topic will be post ICU care. There is a post ICU syndrome. We are going to spend the next 45 minutes talking about post ICU syndrome. This is about recognized entity [Indiscernible - static] one of the problems with people because it has



been proven we would not expect this to have such a profound post ICU course. Let's take a look at post ICU care. Once again, we have a 42-year-old family female G8 presenting with shortness of breath, fever, complicated by the fact that she got sent home only to return back severely ill and requiring ICU care and incubation. She does survive but remains extremely unable to function with acute shortness of breath, pain, sleeping difficulties, and mental cloudiness. She initially got not a lot of respect from her primary care physician, and it now comes to you the pain clinic provider or another primary care provider that sees the patient and recognize her as having post COVID ICU syndrome. You have diagnosed hyperthyroidism and get her started on treatment. She is starting to feel a little better but remains profoundly fatigue. She is able to get out of bed and get her daughter off to school in the morning. She is not yet been able to return to work. [ Indiscernible - static ]

Let's think about COVID and post ICU syndrome. 20% of people infected with COVID19 require hospitalization, and 20% to 30% of hospitalized patients with COVID19 require ICU care. Early estimates of people who required intensive care hospitalization were 6% to 13% of all COVID19 infections. We know there are so many infections we do not know about what we do know are the ones presenting to hospital. Among COVID19 patients 60% survive to return home. We have done an incredible job of improving survival and now we have to figure out how to get them back on track.

Survival of people with critical illness like this are likely to experience [ Indiscernible - static ] ICU Center syndrome. It is defined as new or worsening impaired in its physical, cognitive or mental health status arising after critical illness and persisting beyond acute care hospitalization. The majority of survivors will experience hospitalization, but they will develop post ICU syndrome. It is not a diagnosis for one condition. A constellation of problems. They are physical, cognitive, and mental health. So, expect it, deal with it, and treat it. Reassure the patient that treating this does make a difference.

Anxiety and other mental health problems. This is a very common problem. PTSD was brought up before, how to separate COVID from PTSD and the answers you cannot. People with COVID have PTSD. People living through the pandemic have prolonged stress. In pre-pandemic studies 35 to 45% of patients met diagnostic criteria for anxiety 12 months following discharge from the ICU. 18% met criteria for PTSD anxiety and depression. Risk factors for developing mental health disorders following critical care admission including longer periods of mechanical ventilation and delirium. Given COVID patients are required longer periods of mechanical ventilation and sedation combined with dexamethasone being used to treat these patients. We will see higher rates of problems with this. You add the effect of social isolation before during and after critical care. A small number of studies sessions show that loneliness and depression has increased during the pandemic. Once again, only look at some of the studies coming out of China there were higher rates of neurologic disease. Offering critical care file at to discuss specific concerns and screening. In a private pain setting post ICU setting and this will be important. Take it [ Indiscernible and allow people to express the symptom they are having and treat them. And the B, breathlessness.

Shortness of breath and reduced exercise in pulmonary function. It is extremely common. Some patients are seeing anemia. Respiratory muscle dysfunction in most patients and deconditioning. For patients with a pulmonary embolism that can complicate things. This early planning for rehab is going to be critical. Very important for our patient.

Rehab is to increase functional capacity and reduce symptoms that improve quality of life. We need to be engaging the pulmonary rehab specialist and incorporating the care post COVID. Patient education, family education, psychosocial support, and exercise an individualized exercise prescription medical optimization. Virtual rehab has now been evolving and showing promise. This can include video classes booklets telephone appointments and it is really important in the patient population.

Remember we talked about the six-minute walk test. This can be done remotely. That woman is sit to stand test can be done remotely. You want to be able to incorporate that into what you are doing. Try to maximize the telehealth and prioritize face-to-face visits for we you need them. The C, the central nervous system impairment. Olfactory dysfunction and taste interferes with the ability for good nutrition. Also, cognitive impairment which is so profound. Weakness, loss of muscle mass, this will all be very important to address here you're looking at ways we can take advantage of the brain neuroplasticity and ways we can create neurologic rehab as well.

Dietary intake they remain anorexic or have poor appetite, they have lost their sense of taste and smell, get a dietitian involved. Best way they can improve this can also be important. Remember they also do not feel well enough to prepare meals. How can that be compensated for? Also, some people will develop post excavation dysphasia. We want to make sure that is not what is going on and if necessary, consider a swallowing study [Indiscernible] is not a problem. She did not have a full body event. For patients with persistent difficulties, they may be suggested that we want to make sure we do an evaluation. Patients can be hypercoagulable and profoundly immobile for long periods of time. We want to make sure there is no evidence of pulmonary embolism, myocardial infarction and if they do need anticoags? Have they been adequately anticoagulated? The risk factors for post ICU syndrome. Our patients have many of them. Mechanical ventilation, sedation, delirium, immobility and multiorgan dysfunction, prolongation of the illness the use of critical steroids present in the her [ Indiscernible ] not an issue now. Right now she is not [ Indiscernible ] but was [ Indiscernible ]

If patients are severely septic or any surgeries are needed or presence of postoperative pain, prolonged ICU stay, they are all risk factors. The development of depression and anxiety and PTSD. All of these things put together risk restoration and risk of chronic pain and we may very well see these patients. Related to the long-term effects an increased risk of chronic pain. We want to put together a comprehensive approach for patients and address the issue of the pain and put together a comprehensive whole person approach to chronic pain because we know these patients are at risk of developing long-term pain problems and the sooner we can intervene the better the patient will be. Don't forget about the family. We have talked about the family quite a bit. When patients are

discharged from the hospital there is a decreased quality of life for the family. The family may develop a family related post ICU syndrome.

These are the hallmarks of PICS-F. Elevating anxiety, increased depression in the family, increased fears, they are not sleeping well and have fatigue. They tend to develop intrusive negative thoughts emotional triggers associated with the hospitalization. Avoidance behaviors. Difficulty remembering and concentrating. Difficulty and ability to identify sources of joy in life. Easily startled, prolonged comparable complicated grief, excavated chronic health problems and strained family dynamics. Let's make sure we get the family treated.

If we can get our mental health colleagues to talk to the family questions, we may want to think about it, how would you rate your cognitive functions including your memory, how would you rate your current emotional function, including anxiety and depression before your loved ones hospitalization? Have you been sleeping adequately? Have you been able to return to work? Have you been fearful or anxious? Have you noticed any triggers associated with the hospitalization? What resources are you aware of that provide emotional and mental health support during times of adjustment in life? What sources have you accessed so far or what care have you received? What is the most effective way of improving your physical cognitive and mental functioning since the hospitalized? Do you need additional support?

I think what I am going to do here is try to get the next session in and end early today so let's do this, let's go through and if you could put the fourth series of presentations together, we'll take as long as people want to talk about it. We will get everybody out early today. Same case discussion. What is the goal of medical management? The goal is to optimize the engine and quality-of-life. Shared decision-making will be critical here. Transparency is important for the process of goal setting. Healthcare professionals should advise patients that post COVID conditions are not well understood but we are understanding them better each week and will share progress with them as information emerges. Symptoms not explained by the adequate portion to object to findings are not uncommon. We should never be dismissing them. Even if we do not fully understand what is going on. Many post COVID conditions can be approved through already established symptomatic approaches and breathing exercises. These are critical and we need to send everyone home with breathing exercises post COVID. Creating a comprehensive plan may be helpful for some patients. Speech and language therapy, vocational therapy, neural rehab can TBI specialist help? A conservative plan might be indicated for some consultation returned to exercise, optimizing management of ongoing medical condition. What about a diary. You will see the changes in their health. We can use the telehealth options to review those diaries.

I also mention this [Indiscernible - static ] incredible pushes for people selling everything under the sun. Leasing on substantiated unsubstantiated resources that ivermectin will cure COVID. Trim one where every vitamin will cure your post COVID. [ Indiscernible - static ] Someone was selling regimens guaranteed to cure post COVID. Breakfast, lunch, and dinner are the vitamin supplements that the vitamin seller was

telling people was guaranteed to control their symptoms. And let's keep in mind that herbal or complementary products can provide huge amounts of side effects. That is associated with a significant number of emergency department visits. Many of these emergency department visits will be related to herbal products people would use to counteract some of these COVID symptoms. Energy, sexual enhancement, heart health, sleep, laxative, bodybuilding, [ Indiscernible ], pain or arthritis relief, detoxification and these are all classic factors for people who feel like they need something that the medical profession is not providing them. Also associated with drug interactions and significant side effects.

Once again rest is an ongoing theme holistic support for patients with post COVID symptoms. There are support groups forming that may be extremely helpful for developing resources and learning about resources. And make sure we follow up. We do not use follow up, there are a number of recognized support groups that are extremely helpful in trying to get ideas on how to navigate the complex problem. We have talked and talked about telehealth. I do not think we can talk about it enough. Patients are more willing to do it telehealth in these situations than face to face visit. You can also identify environmental challenges at home or use all your telehealth options. It could be tele education or telemedicine or a patient portal. Interactive patient care, remote patient monitoring, the list is endless. We need to use for adequate follow up for these patients' back-and-forth.

If you want to get everything functional the subset of patients will develop something called post exertion malaise. Worsening symptoms following minor physical and mental exertion. Worsening 12 to 48 hours after activities and lasting for days or weeks. The issue of pacing will be key. You want to be able to do enough but not too much. Ask about post exertion MLAs, review, and brainstorm. Patients need to determine what their limits are. Get there but don't go above it. Patients should not push themselves but once again if they are not getting debilitated by this, they can they consciously increase the activity very slowly but do not overdo or under do. A very difficult balancing act. We want to make sure that they understand that balancing is going to be critical as conditioning is also going to be harmful.

Understand ways that we can slowly add extra activities measured in minutes, frequently during the day, rather than all at once. Expectations need to be managed. Improve function is a long-term goal. Once again, we will pursue this cautiously. Find a way to ask about orthostatic intolerance. How do you feel when you stand for one or two minutes? What happens when you get up rapidly? What about doing the dishes? Can you stand in line? Can you go to the grocery store, hot shower, or bath? [ Indiscernible - static ] good sleep hygiene including making sure you go to bed at the same time every night. Assess for restless legs, a sleep study may be considered. Be consistent. Make sure the room is quiet and relaxing. Remove electronic devices. Avoid large meals, caffeine, and alcohol before bedtime. Try to get some type of physical activity during the day for the person's tolerance. There is an app for that available on all smartphones. It talks to people about how to improve sleep and provides them with a sleep schedule, guided imagery, progressive breathing tool, important also to provide these resources.

Most common pain symptoms we want to address joint pain and maximize non pharmacologic approaches. Stress and movement therapies, move it therapies in general massage, heat, toning exercises, mindful meditation and acupuncture. Use medications cautiously. Start low and go slow. Use not from a logical approach with any medications prescribed. Don't forget about full medication reconciliation. These patients may be seeing many more doctors that you know about. Trying multiple many over the counter medications. Approach the medication reconciliation nonjudgmental except the fact that patients will look elsewhere when we have not been successful taking care of them as we had hoped. Memories such as organizers and portable notebooks and to do lists. Electronic devices such as smartphones and tablets can also offer an added bonus. Take a careful history of caffeine that patients may be taking these two improve fatigue and concentration.

We talked about treating depression and anxiety with a holistic approach and integrated mental health for the patient and family. Don't forget about substance use. Patients who use substances are more likely to get prolonged COVID. Nicotine may be one of our biggest problems. Patients with previous substance use disorder are substantially more likely to develop severe or long-term COVID. Vaping is also a significant problem. The nicotine products may be worse on the lungs. Creating problems with COPD and asthma to ask about it nonjudgmentally so we can come up with approach to treating them should this occur. Patients that have been provided opioids during COVID may have prolonged problems with opioids providing potential negative impacts on the immune system and cognitive problems along with decrease respiratory reserves [ Indiscernible ] increase all reserves and interference with the sleep cycle.

No one knows better than we do on how to have a trial informed approach to this type of care. Prioritize safety. We need to reinstitute the trustworthiness of the healthcare profession as it evolves and learns how to care for patients with this problem. How can we improve full peer support? Do we have peer support networks for patients have long-term COVID who are doing better? How do we collaborate? How to win power for voice and change to hear our patients and see what they have to say. Learn what they have to say. And then be able to then apply that. For them and other patients. How do we address and respect cultural historical and gender issues?

Early literature shows that about a third of patients with long COVID feel better after the vaccine. Let's make sure that we have ongoing conversations about vaccines related to patients and our patient's family. Once again, we're going to get everyone out of here early today. Let's finish up with this case discussion. Then we will call it a day. How do we put the patient pieces together for this patient? Anything people want to add? Any comments or anything more at this time?

Nancy says are these patients being evaluated and treated in person, it would seem that some of the evaluations would be difficult to access or assess virtually? We cannot possibly do everything. It would be overwhelming to the patient. We need to take our cues based on the patient priority and symptoms. So yes, we want to prioritize what we need to do in person and do what we can to follow up virtually. Respect the

complexity of the process and slowly but surely improve each step along the way. Any other comments or questions? Approaches, ideas, anything at all?

[ Silence ] I don't see anything in the chat right now. Let me throw in a couple of other things related to this patient. Again, we want to keep the chat going as long as it is helpful [ Indiscernible ].

She is able to get her daughter ready for school. We have determined that she does not have hypertension but lightheaded due to deconditioning. I am starting an exercise program virtually with a rehab specialist she is able to slowly put together very small episodes of walking within her house. Family therapy with her husband identifies ways to divvy up household responsibilities in a way that they get them what needs to be done. While the progress is substantially slower than they had hoped, they are starting to see things improve. Post COVID can last a long time but is there an end? After 12 months [ Indiscernible ] or does it depend on symptoms those COVID? I think we are seeing variable responses and as we see here, we are seeing variable options in terms of access to healthcare. We are starting to see some people who are better after a few months. We see others in which the symptoms are more prolonged others in which symptoms are improving but not 100% better. We are starting to see resources become more available improving the ability to get better. We are seeing an entire array of responses. It does appear to be that by addressing this we can see improvement. The problem is many many unknowns. Also, as you talk to the family you find out that another thing that has complicated the situation is that the extended family does not live locally. Because of pandemic concerns they have not seen extended family since the beginning of the pandemic. This has further complicated many things related to mental health. Addressing that also has been important. Demonstrating ways they can create virtual ties with family or improve their ties with their family while waiting for a way to safely get together has been important. There was a brief period of time they thought they would schedule a family visit until the most recent surge when things seemed a little more tenuous than they did a few months ago. All family members are now vaccinated. So, they continue to talk about being able to reunite. [ Indiscernible ] That is another thing that has been a piece here missing in terms of family support and mental health and putting the pieces back together.

No right answer here. I'm just asking the question and throwing out ideas. This is a matter of looking at what the patient's symptoms are and priorities and what resource you have to help care for herself and improve function. Any comments or questions? I know anyone to think I have answers. I am throwing out ideas. We do know that functions against functions and respecting the complexity of all we have, and taking advantage of the full resources, and validating the question of concern is key.

There are patients that have had a full lab work and imaging with no significant results is still having prolonged COVID symptoms. How would you approach that? How long has she been getting multidisciplinary treatment?

Once again let's go to the top one the patients that have no significant laboratory findings but have prolonged symptoms, I would focus on what their symptoms are and patient priorities. And look at how we can get rehab involved. If the problems are mostly fatigue, shortness of breath, how do we get a pulmonary rehab? How do we get them an exercise program? Is there no rehab approach we can use? If it is mental health how to get mental health involve for their ability to function? This patient has now been sick for six months. The multidisciplinary approach has been put together over the course of the past few months. We have seen slow definitive progress here. The patient continues to take small steps but continues to improve in a way she wasn't before the program was put together. It is important also to add that the patient was reluctant to get vaccinated thinking she did not need to because she already had COVID, after ongoing education and discussion the patient agreed to vaccination and felt that post vaccination well not 100% better, much of her symptoms improved. It was a key thing here that had been ignored early on. The ongoing education about vaccination and the fact that even if you had COVID you do need to be updated in the vaccine may help symptomatology. That also made a big difference here.

This is critical to make sure everyone's questions about vaccinations are answered. Any other comments or questions? We as pain clinicians and the department of defense and pain clinicians we understand the importance of the integrated approach for many patients. We need to be able to take what we have learned and put them together post COVID and be able to instruct other colleagues about the need for the integrated ongoing function stressing approach using motivational interviewing as well as the resources available to us.

Have we established any COVID long haulers clinics in any military treatment facilities? Are we following COVID19 positive patients with long term symptomatology from a research perspective? It's important to get guide to future management. I have been told that that is going on. I do not have an updated list. I will try to get that list to the group.

What is the Melt method of therapy? Mamie, can you let us know the melt method of therapy. Can you type it in or unmute your yourself? Share with us it sounds interesting and important. I do not know what the Melt therapy is, but the general understanding here is we are just learning how to treat this. We are seeing progress. We need to give patients hope. That we have in fact made progress. We need to make sure they understand that we share our innovations with them. The research is also being shared internationally. We are seeing research shared from all over the world. And that's going to be important.

Restoring your facial stability. I do not know anything about that. It would be interesting to look that up.

[ Silence ] And the other comments or questions? Waiting for Mamie to share what Melt is with us. She may not be able to if she is not called in on the phone.

Any other research in terms of the booster shot and long haul COVID patients?

That is just emerging. Clearly there is controversy about the booster. Here's what we know about the booster shot. We do know we are seeing a significant number of breakthrough COVID cases currently due to the Delta virus. The good news is most of the people with breakthrough coded COVID has mild disease not requiring hospitalization. Even if there is a breakthrough case the vaccination has clearly done his job in terms of preventing severe disease. It has also dramatically decreased the risk of developing long-term COVID. That study just came out. People with infections are unlikely to get long-term COVID and it dramatically decreases your risk of long-term COVID. So, those are very reassuring reports. Since the breakthrough COVID cases are more recent, we do not know for the subset of people who have developed it post vaccination perhaps the prolonged COVID may be easier to treat. That is still to be determined. We're talking about breakthrough cases that have been flourishing the past few months. What we do not know is the long-term impact of booster shots. We do have data from Israel about the short-term impact of booster shots and vulnerable populations. The biggest vulnerable population we are seeing break to covert COVID in are people over 65 and with underlying medical problems. Israel has been the country who has done booster shots earlier than everybody else and acutely they are seeing a dramatic decline in breakthrough cases at the moment. That is all we can say. The data needs to be further analyzed. In this be further analyzed based on who is opting to get booster shots versus not. But really, that's all we know, we do not have a lot of data right now. About the COVID vaccine preventing prolonged COVID just came out. I will double check the reference. It literally just came out during one of the breaks. I will double check that reference and I will try to get it to people, but right now you can take a look at prolonged COVID post vaccine. It came out about an hour ago. It was one study. The news is breaking as we talk.

Anything else? I do not want to leave any stone unturned but conceptually is similar to the things we know we need to do. I wanted to make sure you had all the information available to you. Much of it is evolving and changing. A lot of the information is available on the CDC website. I highly recommend keeping up to date with that. There are a number of articles from the British Medical Journal on long-term COVID that can be helpful.

As long as we keep an open ear and open mind and continue to work with patients and prioritize their needs then I think we can offer patients hope that things can improve. At this point, I am going to stick around for as long as people have questions but let you get out early because we got it done. Thank you all for joining me. Looks like no more questions so have a great afternoon. I will try to get all of those references that were coming off on the fly as we put it together.

Thank you, Dr. Robeck. >> [ Event Concluded ]