

Transcript Details

This is a transcript of a continuing medical education (CME) activity. Additional media formats for the activity and full activity details (including sponsor and supporter, disclosures, and instructions for claiming credit) are available by visiting:

<https://reachmd.com/programs/cme/current-remote-monitoring-technologies-are-understudied-and-underutilized/14125/>

Released: 06/24/2022

Valid until: 06/24/2023

Time needed to complete: 1h 01m

ReachMD

www.reachmd.com

info@reachmd.com

(866) 423-7849

Current Remote Monitoring Technologies Are Understudied and Underutilized

Dr. Elwing:

What about remote monitoring technologies? And how are they utilized for our patients? This is something that's being developed and really a lot of work is going into better understanding how we can use these technologies to care for our patients.

So, in the COVID-19 era, telehealth visits were used more and more frequently than they'd ever been before. And wearable devices were looked at to see if they could play a role in our evaluation. Many wearable devices for monitoring patient activity and vital science have not been fully vetted by the Scientific Literature, but patients are using them, and we are interested in them. One of the most significant challenges in the evaluation of a PAH patient during a telemedicine visit is to figure out how they're actually doing functionally and how they're doing in terms of the right heart failure. We need to look at vital signs, blood pressure, and exercise capacity, and that's sort of challenging when you're talking to someone when they're sitting at their computer or on their cell phone. We could use technology to help us understand their average daily step count, we could look at their weights with a scale that is a smart scale, we could look at heart rate and blood pressure with tracking devices, and we could see once those things are going in the wrong direction, we're getting closer to the patient having a worsening event or nearing risk for hospitalization. So, what patient information could we routinely obtain via remote monitoring to use in these reassessment visits? What data can we really use? Well, we can look at a patient, like we're looking at each other, we can observe physical signs, we can look at general appearance, behavior of the patient, we can look at their skin, we can look at wounds, catheter sites, devices, swelling, rashes, breathing patterns, and physical movement. So, we can learn a lot about how the patient looks and maybe a little bit about how they're feeling by their expressions, and that's why the video portion is so very important for these interactions. We can talk to them about daily physical activity, we might be using accelerometer, or we can do step counting with their watch or their smartphone, we can look at a Pulse Ox. We can look at blood pressure and heart rate and we can at times see JVD. We can do remote monitoring devices to measure parameters, but remember, these are not validated in our PAH patient population, we can get a gestalt about how they're doing through these means.

So, let's talk about these parameters and what is available, okay. So, we have things we want to know; we want to know heart rate, we want to know blood pressure, we want to know step count, some of these can be done through a regular blood pressure cuff and patient uploading them, or we can have a link device that can upload to their smartphone and then they could share that device with us through their MyChart or whatever means that we communicate in our clinics. We could use step counts with smartwatches. We can use a Pulse Ox that could be recorded through their smart device or patient could manually upload. And we could use an Apple Watch or something of that sort to look at heart rhythm. So, we can learn a lot, but this is not going to give us all of our information that we would normally see in clinic. And remember, this is patient-reported data through a device that's not validated.

So, all of the things we talked about are great but one missing link is our six-minute walk distance. We don't have a validated tool to check six-minute walk distance. Currently, we're able to count steps, we're able to look at exercise capacity, we are able to look at things through accelerometry like ActiLife and ActiGraph to see how far patients are walking, but we don't have a tool to definitively look at our six-minute walk distance. A recent study Salvi et al supported the six-minute walk test as a feasible in-home environment using a device-based application but such tools have not yet undergone validation among individuals with PAH.

So can we create a six-minute walk test that can be performed remotely? Activity assessment in patients who are spending most of their

time at home can be challenging. Increased time at home for most individuals has led to substantial cardiopulmonary decondition. Six-minute walk testing is a common clinical instrument we're using in clinic but has not been developed for home use in a validated way. Primary measurement of the test is total distance walked. Secondary measurements are fatigue, dyspnea, pulse ox and recovery. The advent of affordable digital device and mobile phones, it may become possible in the future for the patient to complete this in their home or near their home with sensors like accelerometers or global positioning systems, GPS, to estimate distance walked.

Is step counting the answer for functional capacity assessment? Well, maybe. Smartphones are able to regularly and easily obtain objective measures of physical activity. The Apple iPhone includes a health app that summarize step estimates derived from accelerometric embedded sensors and generated movements as the device went carried and the Android has the same similar kind of offerings. And some people opt for using things like Fitbit or Garmin to do the kind of things that they would do with their smartphone otherwise. And there's even some novel accessories like earphones, necklaces, hats, rings, shirts, to look at this information, but this is variable and again, has not yet been validated for our patients.