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Optimizing The Management of Patients With Heart Failure With the 6-Minute Walk Test

Needs updated

Dr. Feliberti:

Hello, everybody. My name is Dr. Jason Feliberti. I'm a transplant cardiologist here at Tampa General Hospital, and I'll be discussing with you optimizing the management of patients with heart failure with the 6-minute walk test.

Now first, where does a 6-minute walk test fit within the management of patients with congestive heart failure? Well, a couple of things. First, important to note that the New York Heart Association class, which many of us within the heart failure world and cardiovascular disease treatment use to assess and characterize patients in their severity of their heart failure.

As I'm sure many of you are probably familiar with, NYHA functional class goes from classes I through IV, I being those individuals who have no real limitations to their exercise capacity or activities of daily living. NYHA functional class II are those who experience symptoms of fatigue or dyspnea on exertion with moderate degrees of exertion. NYHA functional class III are those that have symptoms of fatigue or shortness of breath with mild levels of exertion. And then NYHA functional class IV are those individuals who have symptoms of heart failure at rest. This schema was first developed all the way back in 1928. So it's a very long time ago, and it remains very subjective.

As a matter of fact, one of its main limitations is poor inter-observable reproducibility. And there have been studies that looked at this and that show that between providers, you get somewhere around 50% concordance of NYHA functional class. And that's, in part, due to its heavy reliance on subjective and clinical judgment and the clinician interpretation of those different functional classes. So if someone has ordinary, slight, or marked symptoms of heart failure, so again, fatigue and dyspnea on exertion with activity.

So in your assessment of a patient, you may think, "Well, my patient's telling me that they're doing fine." But if you think about it, patients with congestive heart failure will limit what they do on a day-to-day basis because of the symptomatology that they have. And so they start to actually pull back on their normal activities of daily living.

And then when coupled with the poor inter-observable variability and reproducibility of NYHA functional class, it's reasonable in that circumstance to perform more objective measurements of exercise capacity to help re-stratify your patients, and that includes the cardiopulmonary exercise stress test, otherwise known as a CPET, and the 6-minute walk distance.

Now, in order to perform a cardiopulmonary exercise stress test, which is the gold standard, this would require the utilization of a cardiometabolic cart as well as a treadmill. This is a much more specialized test, whereas the 6-minute hall walk distance test is a simple, low-cost, reproducible measure of functional capacity, and it, in and of itself, also independently predicts mortality within heart

failure patients, particularly if patients can walk less than 300 meters. This is widely cited as the threshold for higher-risk patients. As a matter of fact when you look at not just within the heart failure world, but also in pulmonary hypertension, the 6-minute hall walk distance is used to characterize patients as low, intermediate, and high risk. This is according to the 2022 ESC and ERS guidelines, where those patients who are at low risk can ambulate more than 440 meters.

Those at intermediate risk can ambulate anywhere from 165 to 440 meters. And those individuals who walk less than 165 meters are of a high-risk category for pulmonary hypertension. And within the 2022 AHA, ACC, and HFSA guidelines in the management of heart failure, the functional assessment of someone's exercise capacity is given a 2A level of evidence C recommendation.

Now of note, the 6-minute walk distance does depend on patient motivation and effort, there is no measurement of a respiratory exchange ratio as there would be in a cardiopulmonary exercise stress test, and elicits only submaximal, meaning functional, not maximal, exercise capacity, and cannot in and of itself characterize the mechanism of impairment, unlike that of a CPEX. Generally, we perform a 6-minute walk distance within our institution at all initial patient visits, its encounters, and we do this to objectively define a patient's functional capacity at that time.

In this test, it's reasonable to repeat the study every 3 months as you make medical management changes, you titrate your guideline-directed medical therapy, to further assess the patient's clinical improvement or clinical deterioration and perhaps need for more advanced therapies.

With respect to intermediary devices such as a Barostim device, we utilize that pre- and post-implant. So once they're about 3 months after post-implantation and at a maximum tolerable and goal milliamplitude on their electrical output for the Barostim device, we then reassess their functional capacity by 6-minute hall walk. As I mentioned previously, if a patient has less than 300 meters, this classically corresponds to a NYHA functional class III to IV symptomatology and worse 3-year transplant-free survival.

This has been looked at before, and that's about 62% versus 82%. When you think about, okay, well, how does a 6-minute hall walk correspond to the various different functional classes? This has been looked at in several meta-analyses, but the most reliable one estimates that for patients who are NYHA functional class I, they vary about 420 meters. NYHA functional class II is about 393 meters. Again, NYHA functional class III, about 325 meters, and NYHA functional class IV are those individuals that walk less than 225 meters.

As a matter of fact, 6-minute hall walk distance was utilized in the BHF clinical trial looking at baroreflex activation using the Barostim device. Within that, as a part of its eligibility criteria, the 6-minute hall walk distance was anywhere from 150 to 400. The average 6-minute hall walk distance within the clinical trial was 325 meters plus or minus 71 meters. So as mentioned previously, this corresponds to patients who have NYHA functional class III symptomatology.

When performing a 6-minute hall walk, you're going to be looking at the total distance walked, the pre- and post-study oxygenation, so the SpO₂, the Borg scale dyspnea score, heart rate, and blood pressure.

To perform the study, you want to have a flat and straight walking surface of at least 100 feet, which is roughly at 30 meters. You want to have some cones set up so that you have turning points for your patients, so they know when to loop around. A stopwatch, a lap counter or distance measure, a chair for the patient to sit and rest, a pulse oximeter, a blood pressure cuff, and a copy of your Borg dyspnea fatigue scale, and supplemental oxygen if needed. Patients should be advised to wear comfortable clothing and walking shoes. And you should document if a walking aid is necessary.

Before the initiation of the test, patients should rest from 10 to 15 minutes in a seated position before they get up and begin to walk. There's no need for a pretrial or pre-test lap. You can just go straight from the seated position into the test at the beginning. You want to screen patients for any absolute contraindications, the most pertinent of which is if someone has acute myocardial infarction within the

last month. Concomitantly also, if patients have acute respiratory failure, they've had a recent or active pulmonary embolism or recent syncope, these would be also absolute contraindications.

Additionally, if someone has significant hypoxemia, so if their resting SpO₂ is 85% or lower at room air or unmanaged cardiovascular instability. And finally, cognitive barriers. If a patient is unable to follow directions and perform the test safely, this would be also an absolute contraindication.

Relative contraindications include tachycardia, so if the heart rate's greater than 120, or hypertension. So if the blood pressure is greater than 180/100, this would also be a relative contraindication. You want to stop the test early if the patient starts to experience exertional chest pain, palpitations, or significant shortness of breath. If they start to appear diaphoretic, pale or ashen, or have profound hypoxemia, so SpO₂ is less than 80% would be a reason to stop the study. Of note, adverse events are rare but can occur in about 2% to 6% of tests.

Well, with that said, that's all the time that we have for today. I want to thank you all for your time and attention during this presentation, and I hope this discussion will be helpful in your clinical practice.