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2022 ERS/ESC PAH Guidelines on Echocardiography

Announcer:

Welcome to CME on ReachMD. This episode is part of our MinuteCE curriculum.

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Dr. Elwing:

So welcome. My name is Dr. Jean Elwing, and I'm a Professor of Medicine and the Director of the Pulmonary Hypertension Program at the University of Cincinnati. We're going to be talking today about essential aspects of the new 2022 ERS/ESC PH guidelines on echocardiography, top-line takeaways.

So do you know the echo values that indicate patients should be referred for right heart catheterization? Well, if not, we're going to talk about this. So let's talk first about the algorithm to evaluate a dyspneic patient in the new guidelines. So an individual is seen for pulmonary hypertension evaluation, cardiac evaluation, or pulmonary evaluation because they're dyspneic. They're usually first seen by a general practitioner, they undergo testing, including EKG, labs, and a clinical assessment. And then they're either routed down the route of a lung evaluation or a cardiac evaluation, or sometimes both. And in that cardiac evaluation, we oftentimes use an echocardiogram. And that's really where we start to talk about how likely does this person have pulmonary hypertension? And do we need additional testing with a right heart catheterization?

So an echocardiogram tells us a lot. The main thing people focus on is oftentimes the TR jet velocity and the estimated pulmonary pressure. But there's much more to an echocardiogram than that. And in the guidelines, they go through many parameters, and talk about how they can help us discern if a patient is at higher risk of having pulmonary hypertension, or not. So we're going to go through each one of these.

So let's talk about the anatomic changes we can see on an echocardiogram. We're going to look at the common views on echocardiogram and what we might look at. So let's look at the parasternal long axis, we can see an enlargement of the right ventricle, as you can see here. Or if you look at the apical four-chamber, you can see that the right ventricle is larger than the left ventricle, and that basal RV/LV ratio is greater than 1. When you look at that parasternal short, you can see the flattening of the septum and a D-shaped left ventricle because of pressure overload. And if you look at the IVC, it might be dilated, and lack of respirophasic changes, consistent with fluid and volume overload.

So those are really important parameters. But we also want to know about functionality of the heart. So we can learn about how well the right heart is functioning and if it's being impaired by something like pulmonary hypertension, by looking at different factors. We can look at the fractional area change. And if it's less than 35%, that's worrisome. We can look at the TAPSE, and if it's less than 18 mm, we have concern for RV dysfunction. And we can look at the peak systolic velocity, the S prime, and if it's less than 9.5 cm/second, we have concern that we might have some adverse effect of elevated pulmonary pressures. And we can also get a sense about if this is pre-capillary disease by looking at the RV outflow tract and the acceleration time. And if it's less than 105 milliseconds, we have concern that this might be pre-capillary disease, if there's a midsystolic notch. So these are things that can be very helpful.

The other parameters include that TR jet. If that TR jet is greater than 2.8, that's concerning that the pressures are higher than normal.

And then we can go on and look at the whole echo and get an estimated pulmonary artery pressure. And that also can drive an assessment.

Other features on echocardiogram that make us concerned about pulmonary hypertension is enlargement of the right atrium, as well as the presence of a pericardial effusion. So all of those things are necessary to be looked at when we're evaluating a patient and determining how likely do they really have pulmonary hypertension? Do we need to go down the path of right heart catheterization?

Alright. So these are some just very nice examples of things we can see on echocardiogram. You see here on the top left, you see a nice envelope and a TR jet that's increased, concerning for elevated pulmonary pressures. We can see in the second box here that the right ventricle is enlarged. And if we go to the bottom right, we see an enlargement of the right atrium. All of these things we're going to be looking at. And I really encourage you to take the time and look at your echocardiograms when you're evaluating patients for pulmonary hypertension, so you can look at many of these features and assess them individually.

So how do we put this together? Okay, the backbone of evaluation of echocardiogram always is the TR jet velocity, but we use the other parameters, the ventricular size and function, the pulmonary artery pressure, and also the diameter, as well as that RVOT, acceleration time. And then we also look at the IVC and the right atrial pressure. And those are three big categories. And if an individual has two or more abnormal, that will affect their overall likelihood of having pulmonary hypertension.

So for example, you'll go to the top of this slide, and you look at a patient who has a TR jet velocity that's equal to or less than 2.8. But if they have two of the three of those abnormalities on echocardiogram, that actually moves them from low risk to intermediate risk. So it's really important that we take the whole picture together, and we get the most out of the echocardiogram read we can.

So how do we put this all together? So we see our patient, we assess their risk factors for pulmonary hypertension, look at that TR jet and look at those other features to determine the probability by echocardiogram that they have pulmonary hypertension. And those at high probability will go straight to a right heart catheterization. Those in the intermediate zone will get their history added to it, look at their symptomatology, and then route to right heart catheterization when appropriate. And those individuals who have a low-risk echo and no high-risk features in terms of their history or symptoms, we're going to look for other causes of their symptoms of dyspnea and exercise limitation. So this echo really drives us down pathways to work up a dyspneic patient.

So in summary, echocardiography is essential in the evaluation of dyspnea in suspected pulmonary hypertension. Echocardiographic evidence of pulmonary hypertension is useful to determine when to proceed to right heart catheterization. Multiple echocardiographic parameters are assessed in addition to that TR jet and estimated pulmonary pressures. And those are extremely important to determine likelihood of pulmonary hypertension. Echocardiographic parameters are employed in the current ERS/ESC guidelines to trigger further evaluation and go to right heart catheterization when indicated.

So thank you so much for joining me.

Announcer:

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