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[www.reachmd.com](http://www.reachmd.com)

[info@reachmd.com](mailto:info@reachmd.com)

(866) 423-7849

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Imaging Modalities: Newer Tools for PAH Diagnosis at the PH Center

### Announcer:

Welcome to CME on ReachMD. This episode is part of our MinuteCME curriculum and is titled "Imaging Modalities: Newer Tools for PAH Diagnosis at the PH Center".

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### Dr. Preston:

"Imaging Modalities: Newer Tools for PAH Diagnosis at the PH Center." Let's talk about a patient who underwent the initial screening at the family physician, or their primary care healthcare provider with a high index of suspicion for pulmonary hypertension. There are several new diagnostic modalities that may be available at a PAH center that we can review. So we all use a V/Q scan to rule out, or suspect pulmonary hypertension secondary to chronic thromboembolism, but there is a V/Q single photon emission, or SPECT that shows a pulmonary perfusion, that measures pulmonary perfusion. There's also dual-energy CT, or DECT for pulmonary perfusion. Another way to assess lung perfusion is with a three dimensional dynamic contrast enhanced magnetic resonance. So we know that the typical MRI doesn't pick up lung abnormalities very well, but this modality that is focused on measuring the lung perfusion has been developed, and may be very useful in the future. Now, for ventilation, there is functional magnetic resonance image, and it can complement the ventilation part of a V/Q scan information. Now cardiac MRIs is crucial because it can assess the right ventricular function and size more accurately, probably than the echocardiogram. It can pick up subclinical dysfunction of the right ventricle, it can do parametric mapping. It can measure right ventricular strain, which is one of the novel parameters that have been developed for pulmonary hypertension. And it can do pulmonary artery four dimensional flow imaging. The cardiac MRI is very important also, because it can pick congenital heart defects that can cause pulmonary hypertension. And, on occasion, we diagnose congenital heart disease even in adults. There is intravascular ultrasound, and optical coherence tomography for PAH. There are also wearable technologies that can measure not necessarily within the diagnosis of PAH but can assess the severity of impairment caused by PAH. And, very recently, there's artificial intelligence tools that are being tested to be used in the diagnosis, in early diagnosis of PH.

So this table, I know it is quite busy, but it highlights the relative strengths, and weaknesses of imaging modalities in the context of pulmonary hypertension. And if we look at chest radiography and V/Q scan, which are the more commonly used tools, and are available everywhere, then we can look at the characteristics of SPECT V/Q, single energy CT angiography, dual energy CT angiography, as well as MRI. And, lastly, we haven't talked about, but pulmonary angiography, which is an invasive test, but it is essential if you suspect, or you found chronic thromboembolism. So, it's a very important tool, and that should be done at the PH center for sure because you require an invasive radiologist, or cardiologist with a trained eye.

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