

New virtual screening tool eases, accelerates routine diagnosis of pulmonary hypertension

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The COVID-19 pandemic has increasing numbers of doctors caring for patients virtually. While critical to protecting patient health during a pandemic, however, virtual care presents unique challenges, especially

when it comes to diagnosis. Now, cardiologists at the Lewis Katz School of Medicine at Temple University (LKSOM), have come up with a virtual screening tool that greatly simplifies the process of diagnosing a complex form of heart failure known as pulmonary hypertension.

The new method—known as the virtual echocardiography screening tool (VEST)—makes use of initial screening data from echocardiography, which captures images of the heart. The ability of VEST to accurately and remotely diagnose [pulmonary hypertension](#), based on simple analysis of multiple echocardiogram features, represents a major advance in virtual patient care.

"VEST enables physicians to quickly evaluate patients for pulmonary hypertension by simply searching for routine key measures indicated in echocardiogram reports," explained Anjali Vaidya, MD, FACC, FASE, FACP, Co-Director of the Pulmonary Hypertension, Right Heart Failure & CTEPH Program at Temple University Hospital, Associate Professor of Medicine at LKSOM and lead author on the new study. The report describing VEST was published online September 17 in the journal *Pulmonary Circulation*.

Pulmonary hypertension occurs when there is high pressure in the blood vessels connecting the right and left sides of the heart and can lead to right-sided heart failure. The condition typically is diagnosed based on right heart catheterization, which distinguishes specific types of the disease. Because patients with pulmonary hypertension are at high risk of serious illness if infected with COVID-19, due to pre-existing heart and lung disease, traveling to a Pulmonary Hypertension Center of Comprehensive Care or visiting a hospital to undergo invasive right heart catheterization for diagnosis is not as readily available as it had previously been. Most patients who are referred for invasive testing with right heart catheterization and evaluation previously have undergone echocardiography.

The new study shows that VEST is especially effective in distinguishing between the two most common, though very different, subtypes of pulmonary hypertension—the first caused by left heart disease, and the other by pulmonary arterial hypertension (PAH). Patients with pulmonary hypertension due to PAH frequently suffer poor survival. Delays in diagnosis (often up to 2-3 years) and treatment greatly impact these outcomes.

To evaluate the effectiveness and accuracy of VEST, Dr. Vaidya and colleagues analyzed data from patients with pulmonary hypertension who underwent right heart cardiac catheterization as well as echocardiography. To predict the subtype of pulmonary hypertension from echocardiography, the researchers looked at select reported echocardiogram features, including size and shape of the heart chamber and Doppler features. Scores derived from these measures were used to predict PAH versus pulmonary hypertension due to left [heart](#) disease.

"This is the first time that routine interpretation of echocardiogram reports, without direct advanced review of imaging, has proven to be effective," Dr. Vaidya said. "By using parameters routinely reported in echocardiograms to assess hemodynamic profiles, VEST truly facilitates the diagnosis of pulmonary hypertension."

"VEST makes early recognition of the condition possible, allowing patients to receive more timely referral for appropriate evaluation. The fact that this can be done remotely during virtual telemedicine visits is especially relevant in the COVID-19 era."

The next step for VEST centers on investigating its long-term impact on patient outcomes. "Now that we have a tool for assisting virtual diagnosis of pulmonary [hypertension](#) that any physician could use, we have a real opportunity to examine long-term outcomes in patients referred for treatment based on VEST findings," Dr. Vaidya added.

More information: Anjali Vaidya et al, Virtual echocardiography screening tool to differentiate hemodynamic profiles in pulmonary hypertension, *Pulmonary Circulation* (2020). [DOI: 10.1177/2045894020950225](https://doi.org/10.1177/2045894020950225)

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