New Technologies Offer UHealth Interventional Cardiologists Greater Precision, Improved Patient Selection

One is software, one is a device, and both are helping cardiologists help people with blockages, restricted blood flow and microvascular disease around the heart.

HeartFlow 3D analysis model

The AI-powered software called HeartFlow (HeartFlow Inc.) interprets CT scans of the blood vessels around the heart. HeartFlow generates 3D images that can help identify any vessels that are fully or partially blocked, indicating that an individual might need to go to the catheterization lab for further workup. If blood flow appears normal, it could help spare a patient from invasive procedures to measure the flow. In this case, doctors might be able to treat some patients with medication instead.

“We could cut down on the number of diagnostic and basic procedures we do — and only refer patients in the most severe cases who would need further intervention,” said Carlos E. Alfonso, M.D., interventional cardiologist at UHealth – University of Miami Health System and associate professor of medicine at the University of Miami Miller School of Medicine.
The HeartFlow can also be valuable to help people avoid other unnecessary procedures. In the past, if someone had a “borderline lesion” on an angiogram, typically they were referred for a cardiac stress test or sent directly to the cath lab for invasive assessment. Because HeartFlow measures blood flow non-invasively, some patients might be able to forgo these interventions as well.

**CoroFlow Directly Measures Blood Flow**

If a patient is referred to the cath lab, a new tool called CoroFlow (Coroventis) can help get a more precise diagnosis. CoroFlow is a comprehensive physiology solution (hardware and software) that utilizes a thin coronary pressure wire, the Abbott Pressure Wire X. The wire is able to accurately assess flow impairment in both the visible coronary arteries, as well as the invisible coronary microvasculature to assess for microvascular disease.


Microvascular disease has been traditionally difficult to evaluate and is not benign. “It can lead to some of the same symptoms — chest pain and angina — as patients with other coronary disease,” Dr. Alfonso said.

The CoroFlow could help when a patient has typical symptoms but does not have obstructive coronary disease. “We know that microvascular disease is something that occurs much more commonly in women than men. Up to 50% of women that have
angina or anginal symptoms have been shown to have non-obstructed coronary vessels but could have microvascular disease,” Dr. Alfonso said. Therefore, the technology can facilitate a formal diagnosis and help physicians adjust treatment that could most benefit people with microvascular disease.

**UHealth on the Forefront**

Both advances are available to patients at the University of Miami Health System. “UHealth remains on the cutting edge, leading the field as one of the first in South Florida to use these technologies,” Dr. Alfonso said. “Implementing these diagnostic tools into our clinical practice helps us learn how to incorporate the additional information provided to best treat our patients — and also helps us educate the next generation of users through our fellowship and training programs.”

The CoroFlow device is also being used to assess microvasculature and endothelial function in various studies, including a clinical trial of stem cell therapy in diabetic patients, underway and currently enrolling patients at the University of Miami, called the “Allogeneic mesenchymal human stem cell infusion therapy for endothelial dysfunction in diabetic subjects with symptomatic ischemic heart disease ACESO-IHD trial” (ClinicalTrials.gov Identifier: NCT04776239).

Other clinical trials are in the planning phase to study certain subgroups of patients with ischemic heart disease and determine if they might benefit from the use of these technologies to better guide their treatment. Dr. Alfonso added, “We anticipate hosting seminars and working groups in
the future to raise awareness and offer education about these technologies.”

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