Beyond The Beat: Flownostics' Noninvasive Revolution In Heart Health

Western University

What Makes Flownostics Special?

Flownostics' technology lets doctors quickly, accurately, and noninvasively measure blood flow and pressure around blockages in the heart's arteries caused by plaque buildup. This helps clinicians decide if a patient needs an intervention such as bypass surgery or coronary stent implant.

Currently, similar diagnostic tests are either performed invasively in a catheterization lab using a pressure sensor, or rely on heavy computer simulations of blood flow that take a lot of time and often have to be done remotely in distant labs. Flownostics™ changes that.

This major breakthrough comes from Dr. Aaron So, a scientist at Lawson Health Research

Institute and a professor at Western University. He founded a company called Flownostics to bring this life-saving technology to hospitals and clinics. As Dr. So puts it: “Each step forward in heart diagnostics extends lives and enhances the quality of every heartbeat.”

Flownostics uses a short dynamic CT scan acquired after injecting a small volume of contrast agent for blood flow assessment. This approach analyzes blood flow characteristics using dynamic image data without computer simulation. As such, the analysis is fast and can be done locally at the hospital where the patient is being treated, helping doctors make quicker decisions.

The Flownostics’ technology is also better at handling more complex cases with calcium buildup in the heart’s arteries. Calcium build up can confuse the current noninvasive test relying on blood flow simulation. This makes blood flow assessment in the heart’s arteries more reliable across different pathological conditions.

More Than Just Arteries

Flownostics has another powerful tool: it can measure variation in blood flow in large blood vessels during a single heartbeat with excellent resolution. This is especially useful for spotting valve problems, like aortic stenosis — when the heart valve is too stiff due to of plaque buildup on the valve surface. During a single heartbeat, the heart muscle squeezes to pump blood from the heart chamber into the aorta. The valve between the heart chamber and the aorta serves as a gate to control blood flow. When the heart valve is too stiff and doesn’t open properly, the peak blood flow across the valve decreases significantly, which signals that the valve needs to be replaced.

No current CT blood flow assessment methods offer sufficient resolution to determine the peak blood flow in the aorta at the contraction phase of a heartbeat. The unique Flownostics technology facilitates this assessment and, therefore, can help decide if a patient needs valve replacement surgery, all without any invasive tests.

Altogether, the Flownostics system offers a full, noninvasive way to assess heart health — something no other technology can match.

A Bright Future Ahead

Dr. So's alliance with the Western Technology Transfer Office (formerly WORLDiscoveries) has been instrumental in navigating the complex realm of intellectual property and market strategy in order to bring this innovative technology to the forefront of cardiac care.

With the strategic backing of the Western Technology Transfer Office, clinical trials are happening around the world, and additional patents have been filed. Flownostics is on track to transform how doctors diagnose and treat heart disease — making care faster, safer, and better for patients everywhere. Flownostics could soon become the new "gold standard" for non-invasive heart testing.

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