

Biotech Innovations

Researchers Test New Techniques to Rule Out and Predict Heart Attacks

A new protocol to rule out myocardial infarctions (MIs), or heart attacks, in emergency departments using a recently approved high-sensitivity troponin *t* test was found to be safe and accurate in a [study](#) published in *Circulation*.

Most US hospitals use an older troponin assay that's less sensitive and precise than the new high-sensitivity assay, according to lead study author Rebecca Vigen, MD, a cardiologist at the University of Texas Southwestern Medical Center in Dallas. Her team developed a novel protocol for using the new test based on published studies and European guidelines, which endorse it for ruling out MI.

In the study involving 536 patients in the Parkland Health and Hospital System emergency department, the existing protocol using the conventional assay ruled out 80.4% of patients for MI at 3 hours, whereas the new protocol ruled out 54.8% of patients by 1 hour, and an additional 28.9% at 3 hours.

Neither protocol missed any heart attacks, but the new protocol "ruled out more patients for heart attack and did so faster than the traditional protocol," Vigen said. "With this new assay, many patients who come to the [emergency department] with chest pain may be able to be reassured sooner that [their] symptoms are not due to a heart attack."

Vigen cautioned that the study was small and only evaluated the protocol in 1 population. "We need to study this algorithm in other populations and examine how this may affect health care utilization and costs," she said.

A different team of researchers is also homing in on a way to predict heart attacks using routine coronary computed tomographic (CT) angiography to noninvasively detect coronary inflammation. They [recently tested](#) a new imaging biomarker called the **perivascular fat attenuation index** (FAI) to quantify

inflammation-induced changes in fat around the coronary arteries.

Data were collected from 2 patient cohorts undergoing standard coronary CT angiography: 1872 patients at the Erlangen University Hospital in Germany from 2005 to 2009 (derivation cohort) and 2040 patients at the Cleveland Clinic from 2008 to 2016 (validation cohort). Perivascular fat attenuation was mapped around the 3 major coronary arteries, and the prognostic value of the perivascular FAI was assessed for all-cause and cardiac mortality over a median follow-up of 72 months in the derivation cohort and 54 months in the validation cohort.

In both cohorts, perivascular FAI values around the proximal right coronary artery and left anterior descending artery were predictive of all-cause and cardiac mortality.

According to study coauthor Milind Y. Desai, MD, a cardiologist and imaging specialist at the Cleveland Clinic Heart and Vascular Institute, the perivascular FAI potentially identifies patients who are at heart attack risk due to atherosclerotic plaques that may be not be severe enough to cause anginal symptoms but are highly inflamed and potentially unstable. Future studies will explore if intensifying existing therapies or developing newer therapies to target the perivascular FAI could help to modify the risk of future coronary events.

In-home Robots Improve Social Skills in Children With Autism

In a recent [open-label pilot study](#), Yale University researchers demonstrated that children with autism have improved social skills after a month of daily 30-minute interactions at home with an autonomous [socially assistive robot](#).

The study involved 12 children with autism spectrum disorder between 6 and 12 years old who played social skills games with their caregiver and a 12-inch table-top robot that speaks and exhibits expressive behaviors. An on-site computer subsystem controlled the robot's movements



and behaviors and automatically adjusted the difficulty levels of the games based on the children's performance, with no researcher assistance.

At the end of the intervention, the children had significant improvements on a standard test of joint attention ability, a critical social skill that's often deficient in autism. Caregivers also reported that the children made more eye contact, initiated social interactions more frequently, and responded appropriately to social requests more frequently at the end of the month. The kids continued to use the robot throughout the study period and performed more challenging social skills activities as the month progressed.

According to Brian Scassellati, PhD, a computer science professor at Yale and lead author of the study published in *Science Robotics*, children with autism may be asked to do up to 40 hours of therapy per week, and maintaining the motivation for so many hours of repetitive therapy can be daunting. His team hopes that their device "could help to ensure adherence to prescribed activities and magnify the efforts of both clinicians and families," he said.

Next, the researchers plan to develop a robotic system that can operate for longer in the home, which they'll test in a randomized trial.—**Jennifer Abbasi**

Note: Source references are available online through embedded hyperlinks in the article text.