AI could check millions of CT scans for heart risk. Who will pay for it?

Screening algorithms could flag undetected risk — and unleash a flood of billable follow-up care

By Katie Palmer – STAT News
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In a CT scan, coronary artery calcium shows up as distinct, bright pixels. It looks like salt in the pepper of the heart. The more calcium, the higher a patient's risk of a heart attack.

Often, a cardiologist looks for those bright spots on purpose: They'll grab snapshots of the heart between beats, to get the clearest possible view of the coronary arteries. But calcium is also visible on zoomed-out chest CTs that aren't synchronized with the heart. Every year, patients receive 19 million of those more general scans — to screen for lung cancer, or investigate a persistent cough — and an eagle-eyed radiologist can report any incidental calcium they spot.

But even as heart disease remains the top cause of death in the United States, an estimated 20% to 40% of that incidental calcium goes unreported. "We need to find more of these patients," said Ami Bhatt, chair of the Food and Drug Administration's Digital Health Advisory Committee and chief innovation officer of the American College of Cardiology.

Guidelines are evolving to do just that. In March, the American College of Cardiology and the American Heart Association recommended that doctors use incidental calcium findings to guide the use of cholesterol-lowering statins. And for the first time, they invoked artificial intelligence-based algorithms that automate that opportunistic screening.

A computer doesn't get tired of looking for specks of salt in a sea of pixels. It can automatically quantify the calcium it sees, both in the coronary arteries and the aortic valve. "Without anybody needing to lift a finger on a day-to-day basis, patients can get screened for cardiac diseases," said Nish Khandwala, CEO of Bunkerhill, one of several companies with FDA-authorized algorithms to find incidental calcium in existing chest CTs. And as of April 1, health systems can get paid about $15 per scan by Medicare to use those algorithms for certain patients.

The updated guidelines and the new Medicare payment pathway could speed the adoption of AI-based coronary calcium screening — perhaps catching more undiagnosed heart disease than radiologists do with their bare eyes. But opportunistic screening also reveals the tension created as more AI tools are deployed en masse in clinical medicine: Applying the algorithms across millions of existing chest CTs could open a Pandora's box of population-wide spending before there's evidence to show they improve patients' long-term health.

At the University of Texas Medical Branch, which uses Bunkerhill's algorithm, chief AI and digital officer Peter McCaffrey believes in the tech's ability to find and treat cardiovascular disease earlier. But he was surprised when he heard news of the Medicare code. "I assumed that payers would not want to assign a reimbursable code to something that could be done with the scalability of opportunistic computation," he said.

It's still unclear in what cases Medicare will reimburse for AI-based coronary calcium screening, or whether commercial insurers will follow suit. "We're going to have to start to risk-stratify people before we hand out 19 million CAC scores," said Bhatt. Now comes the hard part: Determining who it makes sense for, and therefore when to pay for it.

Opportunistic screening: A friend or a foe?

Opportunistic screening is supposed to be in the Goldilocks zone for clinical AI.

It uses scans that already have been ordered: No extra radiation exposure for patients to catch cardiovascular risk. Low marginal costs.

And for the hospital system paying for the tech, a clear business proposition: AI algorithms can quickly identify plenty of new cardiology patients who will need billable follow-up testing or procedures to manage their heart health.

“They see more patients downstream, and in the fee-for-service world, that makes the hospital more revenue,” said Khandwala.

In a Stanford trial of Bunkerhill’s algorithm published in 2023, patients whose CT scans revealed incidental CAC were randomized to receive a follow-up with their primary care physician, or usual care. Six months later, 51% of the notified patients had gotten a statin prescription for the first time. Among the control group? Just 7% had started on therapy.

Some patients will be put on a statin and can be managed by a primary care provider. But that study also showed notified patients were more likely to get follow-up testing. That can include stress tests, coronary CT angiograms, and invasive coronary angiography. High-risk patients may need stents or bypass surgery to restore their blood flow. For a large health system, AI vendors estimate all the follow-up care could add up to tens of millions in new revenue.

For all those dangling dollars, AI-based opportunistic screening for coronary artery calcium still hasn’t taken off. At Aidoc, another company with an opportunistic CAC algorithm, just 20 of its 250 health system customers are using its CAC tool, said Chief Medical Officer Jesse Ehrenfeld.

Sometimes, a health system’s executives just don’t believe the algorithms would work, either to catch patients or generate revenue, or both. Even if they do, it can be hard to get everyone on board.

Typically, a cardiology team will be interested in the screening AI, said Orit Wimpfheimer, chief medical officer at Nanox, another company with an incidental CAC algorithm. But radiologists then need to spend extra time to double-check the algorithm’s calcium scores — and they aren’t getting paid for that work. “The radiologists are like, ‘OK, so what are you going to give me for it?,’” said Wimpfheimer.

Bunkerhill got around that problem by appealing to the FDA, said Khandwala, lobbying to have results go directly to a cardiologist or primary care physician. But there were still more issues to deal with.

“The whole thing about AI is that it’s supposed to make our life easier,” said M. Barbara Srichai-Parsia, director of the noninvasive cardiology lab at MedStar Georgetown University Hospital. “But AI just generates way more additional stuff that makes your life harder.”

Cardiovascular disease is so common, and chest CTs so numerous, that a health system could risk overloading itself. At MedStar Georgetown, cardiologists were initially hesitant to provide automated calcium scores “that were going to make patients scared, flooding us with referrals when we’re already so backed up,” said Srichai-Parsia.

In one health system that used Bunkerhill’s AI, 63,000 patients out of 120,000 had a moderate or severe calcium score over 100, said Khandwala. But 85% of those might not be worth notifying: Some were already seeing a cardiologist and taking the right meds. Others had more pressing illnesses to tackle.

Somebody — or something — needs to review patients’ charts to decide which patients at which threshold will get notified of their results, and how.

Reimbursement, the AI companies hope, could start to make all that work seem worth the effort.

“All the competing companies, we were all trying to push CMS for some reimbursement because we saw that what was preventing widespread implementation,” said Wimpfheimer. Now, with the statin-initiation guideline, “we have two new tools in our deck.”

At $15 a pop, Medicare’s national payment rate for opportunistic calcium AI in the outpatient setting is lower than for other cardiology algorithms. But it could also potentially be applied to many more scans. Bunkerhill just received two more clearances that allow its algorithms to run on chest CTs with contrast, potentially adding even more scans to the opportunistic screening bucket.

For now, there's no national coverage determination for the algorithms: Local Medicare administrative contractors will be the ones deciding which claims get paid and why. "That's what's great about a G code. They're temporary, they're flexible, they allow CMS to experiment with new models, because there are many unanswered questions," said Ehrenfeld. "Hopefully we can bridge that transition and figure out, OK, what is the right way to do this? How do we build the evidence?"

Evidence for better health vs. 'biomarkup'

As those coverage decisions start rolling in, cardiologists encourage caution.

"On the face of it, it seems to make sense," said Sanket Dhruva, a health policy researcher and cardiologist at the University of California San Francisco. "But there are many factors that we need to think about before wide scale deployment, which is obviously going to be propelled now by reimbursement."

Though research shows that AI-based calcium screening can get more patients on statins, that doesn't prove whether those patients will eventually have lower rates of heart attacks, strokes, and death from cardiovascular disease.

"We don't have the evidence that we should treat everything we find," said Morteza Naghavi, CEO of HeartLung, another opportunistic CAC vendor. "If you don't have evidence that treating them can improve outcomes, you might be hurting people." Follow-up CT scans expose patients to a degree of radiation. Invasive coronary angiograms reserved for higher-risk patients come with the potential for bleeding and other complications. And then there's the stress of walking in for a routine scan and leaving with an unexpected diagnosis.

For years, the researchers behind Stanford's statin-initiation trial have been trying unsuccessfully to get funding to study real outcomes like cardiovascular events. "Establishing the workflows that this information from this algorithm translates to better cardiovascular prevention, that's a really big hurdle," said Alexander Sandhu, a cardiologist at UCLA Health who co-authored the study. He is co-leading a multi-site trial that

will track the impact of Bunkerhill's algorithm on cholesterol levels; it's funded by Amgen, which makes a cholesterol-lowering drug.

Until better evidence emerges, every health system has to decide for itself how to implement AI-based cardiovascular screening at scale. It's a balance of clinical judgement and resource juggling. Some patients get form letters, illustrated by their own calcium images. Others get portal messages, or a proactive outreach from a cardiology team if their numbers are especially high. Some health systems rely on automated review of patients' medical records to determine the need for follow-up, while others turn to staff nurses to do the work by hand.

"We need to make sure that widespread investment in these population health screening mechanisms lead to improved clinical care," said Sandhu. "And we also need to monitor how much downstream utilization it drives and the subsequent costs."

As AI makes it ever-easier to quantify a patient's health, health informaticist Ken Mandl has noted the risks of commercial interests consciously and unconsciously influencing medical care — a concept he's termed "biomarkup." Over time, health systems tend to favor tests that lead to further testing or procedures or prescribing, said Mandl, who directs the computational health informatics program at Boston Children's Hospital. "I do think the biomarkup phenomenon in AI is going to really pick up," he said.

AI-based cardiovascular screening may pay off for patients in the long term. But it also calls for careful surveillance of existing programs — and over time, scrutiny of the growing stable of opportunistic algorithms.

"It's not going to be limited to chest CTs," said Bhatt. The body offers many windows into its vasculature. Arteries appear in regular breast cancer screening mammograms. Blood vessels are visible in the retina. And there are algorithms to analyze them all. For now, sweeping claims about their long-term health benefits may need to be taken with a grain of salt.

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