AI detects hidden heart disease using existing scans stored in patient records

by Mass General Brigham

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SUMMARY:

Researchers from Mass General Brigham and the VA have developed an AI tool, AI-CAC, that analyzes existing chest CT scans to identify patients with high coronary artery calcium levels, which may indicate an increased risk of cardiovascular events. The tool demonstrated high accuracy in predicting heart disease outcomes, suggesting significant potential for improving patient care through more proactive diagnosis using routine scans.

KEY POINTS:

AI-CAC Tool Development

- Created by Mass General Brigham in collaboration with the VA to assess cardiovascular risk.
- Analyzed previously collected non-gated chest CT scans for calcium deposits indicative of coronary artery disease.
- Published in NEJM AI in June 2025, highlighting its accuracy and potential clinical benefits.

Clinical Significance

- High coronary artery calcium (CAC) levels are strong indicators of future heart attacks and long-term mortality.
- AI-CAC achieved 89.4% accuracy in detecting the presence of CAC and 87.3% accuracy in assessing moderate cardiovascular risk.
- Patients with CAC scores above 400 were found to have 3.49 times higher risk of death within a decade compared to those with zero CAC.

Data and Methodology

- The model was trained on chest CT scans from 98 VA medical centers, including a diverse veteran population.
- Tested on 8,052 scans, simulating CAC screening in routine clinical practices.

Implications for Healthcare

- AI-CAC offers a proactive approach to cardiovascular risk detection by utilizing existing imaging data taken for other diagnostic purposes.
- This technology could reduce morbidity, mortality, and healthcare costs through earlier intervention and treatment.

Future Research Directions

- Plans to validate AI-CAC's effectiveness in the general population beyond the veteran demographic.
- Upcoming studies to explore the impact of lipid-lowering treatments on CAC scores in identified patients.