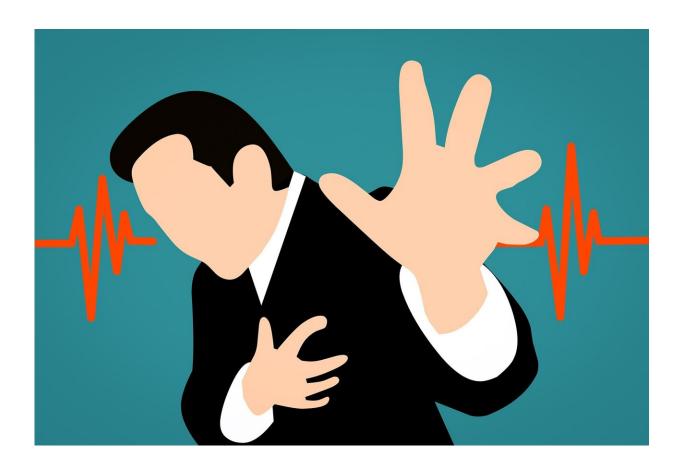# Medical Xpress

AI tool could help thousands avoid fatal heart attacks

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An AI tool that can predict 10-year risk of deadly heart attacks could transform treatment for patients who undergo CT scans to investigate chest pain, according to research presented today at the [American Heart](#)

Association's Scientific Sessions in Philadelphia.

In the first real-world trial of the AI tool, it was found to improve treatment for up to 45 percent of patients. The AI technology could potentially save the lives of thousands with chest pain, who may not have been identified as at risk of a heart attack, and therefore may not have received appropriate treatment to lower their risk. With the technology also found to be cost-effective, the researchers hope it could change the management of patients who are referred for chest pain investigations, across the NHS.

Every year in the UK around 350,000 people have a cardiac CT scan—the standard test to identify any narrowings or blockages in the coronary arteries. In around three quarters of cases, there is no clear sign of significant narrowings, so patients are often reassured and discharged. Unfortunately, many of these people will die from a heart attack in future, because small, undetectable narrowings may break up if they are inflamed, blocking the arteries. Until recently, it was not possible to identify these patients at risk.

In the new study, Professor Charalambos Antoniades and his team at the University of Oxford's Radcliffe Department of Medicine, analyzed data from over 40,000 people undergoing routine cardiac CT scans at eight UK hospitals. Participants were followed up for a median of 2.7 years. While those with significant coronary artery narrowings were more likely to have serious cardiac events or death, twice as many patients with no significant narrowings experienced heart attacks and cardiac deaths.

The team then used a new AI tool, trained using information on changes in the fat around inflamed arteries—which can indicate the risk of events such as heart attacks—as well as information on narrowings of the arteries and other clinical risk factors. Further testing on an

additional 3,393 patients over 7.7 years revealed it could independently and accurately predict risk of cardiac events.

Among those with no obstructions to their arteries, those with the highest levels of inflammation in their blood vessels had a more than 10-fold higher risk of cardiac death compared to those with lower levels of inflammation.

In a world-first pilot, the team provided AI-generated risk scores to clinicians for 744 consecutive patients, and found that in up to 45 percent of cases, clinicians altered patients' treatment plans, indicating that this AI tool could be hugely valuable in guiding and informing how patients with chest pain are managed, ensuring early identification and preventative treatment of those at highest risk.

Analysis comparing the use of the AI tool to standard care revealed it was highly cost-effective for the NHS. In addition, the researchers estimate that implementing this technology in the NHS could lead to over 20 percent fewer heart attacks and 8 percent fewer cardiac deaths and strokes, among those having the test. With the technology required to power the AI tool already commissioned by NHS England for a pilot program in five NHS hospitals, the researchers are hopeful that it could soon be rolled out across the UK.

Professor Charalambos Antoniades, BHF Chair of Cardiovascular Medicine and Director of the Acute Multidisciplinary Imaging & Interventional Centre, at the University of Oxford, said, "Our study found that some patients presenting in hospital with chest pain—who are often reassured and sent back home—are at high risk of having a heart attack in the next decade, even in the absence of any sign of disease in their heart arteries. Here we demonstrated that providing an accurate picture of risk to clinicians can, alter and potentially improve the course of treatment for many heart patients.

"We hope that this AI tool will soon be implemented across the NHS, helping prevent thousands of avoidable deaths from heart attacks every year in the UK."

Professor Sir Nilesh Samani, Medical Director at the British Heart Foundation, said, "This research shows the valuable role AI-based technology can play in better identifying those patients most at risk of future heart attacks and thereby help clinicians make better treatment decisions for their patients."

"Too many people are needlessly dying from heart attacks each year. It is vital we harness the potential of AI to guide patient treatment, as well as ensuring that the NHS is equipped to support its use. We hope that this technology will ultimately be rolled out across the NHS, and help to save the lives of thousands each year who may otherwise be left untreated."

Provided by University of Oxford