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News Release

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High adopters of AI-enabled screening tool are more likely to diagnose left ventricular dysfunction than low adopters, Mayo Clinic study finds

ROCHESTER, Minn. — [Artificial intelligence](#) can improve diagnosis and treatment for patients, but first the AI-enabled clinical tools have to be easily available and used.

New research from [Mayo Clinic](#) finds that clinicians who were high adopters of an AI-enabled clinical decision support tool were twice as likely to diagnose low left ventricular [ejection fraction](#) as low adopters of the tool. The study, published in [Mayo Clinic Proceedings](#), found wide variation in the rate of adoption of AI recommendations. Clinicians who were high adopters tended to be less experienced in dealing with patients with complex health issues, but age, gender, years of experience and number of patients cared for were not significant factors.

"It was surprising to see the significant difference in the rate of diagnosis between high adopters and low adopters," says [David Rushlow, M.D.](#), a Mayo Clinic physician and chair of [Family Medicine for Mayo Clinic](#) in the Midwest. "The tool is extremely helpful, but we did not expect to see a full doubling of the diagnosis rate of low ejection fraction as compared to low adopters."

Ejection fraction measures the percentage of blood that leaves the heart each time it contracts. Low ejection fraction can be caused by heart muscle weakness, such as cardiomyopathy, as well as heart valve problems, uncontrolled high blood pressure or damage caused by a heart attack.

Early diagnosis and treatment in patients with low ejection fraction is critical to reduce the risk of symptomatic heart failure, hospitalization and mortality. "AI decision support tools have the potential to be very effective in aiding the diagnosis of serious health conditions before the onset of usual clinical symptoms, and may outperform traditional diagnostic approaches," Dr. Rushlow says.

Clinicians at 48 Mayo Clinic primary care practices in Minnesota and Wisconsin participated in the randomized controlled trial, which involved 358 physicians, nurse practitioners and physician assistants, of which 165 clinicians were randomized to the AI arm and were included in the current adoption analysis. The AI algorithm was run on 22,641 patients who had an [electrocardiogram](#) (ECG) performed between Aug. 5, 2019, and March 31, 2020. The clinicians who were randomized to the intervention group had access to the screening report, which displayed the AI-ECG screening as positive or negative; the clinicians who were randomized to usual care did not have access.

When the report was negative, no further testing was recommended, but when it was positive, the recommendation was "to consider ordering an [echocardiogram](#)." The clinicians also received an email alert when the AI-ECG screening was positive, indicating patients had a high likelihood of previously unrecognized low ejection fraction.

"Clinicians who were most likely to follow through with the recommendations of the AI decision aid tended to be less experienced in dealing with complex patients," says Dr. Rushlow. "This demonstrates the importance of AI systems that integrate seamlessly into the workflows of clinicians. Given the technical nature of AI in health care, it often is initiated and developed in academic specialty practices. To maximize AI's benefits, more collaboration is needed between specialty practices and primary care."

Mayo Clinic holds a patent for the AI technology and may receive financial benefits from it, but it will not benefit financially from its use in the care of patients at Mayo Clinic. Co-authors [Itzhak Attia, Ph.D.](#), [Paul Friedman, M.D.](#), and [Francisco Lopez-Jimenez, M.D.](#), also may receive financial benefits from this agreement. The remaining co-authors report no competing interests.

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