Artificial Intelligence-Assisted Echocardiography for Early Detection of Left Ventricular Dysfunction

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Early diagnosis of left ventricular dysfunction is essential to reduce cardiovascular morbidity and mortality. Conventional echocardiography remains the primary imaging modality; however, interpretation may vary depending on operator experience. Artificial intelligence (AI)-based image analysis has emerged as an effective solution to improve diagnostic accuracy and efficiency.

This study evaluated an AI-assisted echocardiographic workflow in 320 patients with suspected heart failure. Automated assessment of left ventricular ejection fraction, global longitudinal strain, and chamber dimensions was compared with expert cardiologist interpretation.

The AI platform demonstrated high agreement with expert measurements while significantly reducing reporting time. Diagnostic sensitivity for identifying mild ventricular dysfunction improved, particularly in patients with preserved ejection fraction.

AI integration into routine echocardiography may enhance workflow efficiency, reduce observer variability, and support earlier clinical intervention in patients with cardiovascular disease.

Biography

Dr. Amelia Thompson is a Consultant Cardiologist at the University of Manchester with research interests in cardiovascular imaging, echocardiography, and artificial intelligence applications in clinical cardiology. She has authored numerous peer-reviewed publications focusing on innovative diagnostic technologies.