AI detects systolic heart failure from wearable devices

August 17 2023, by Julie Parry

Credit: Pixabay/CC0 Public Domain

Wearable devices often pick up noisy electrocardiograms (ECGs), which can hinder artificial intelligence (AI)-based detection of cardiovascular disease.

In a paper titled, "Detection of left ventricular systolic dysfunction from single-lead electrocardiography adapted for portable and wearable devices," published in *npj Digital Medicine*, researchers from Yale Cardiovascular Medicine and Computer Science developed a noise-adapted AI model that can detect left ventricular systolic dysfunction (LVSD) from ECGs obtained by wearable devices.

Yale researchers used 385,601 ECGs for the development of a standard and noise-adapted AI model. To train the noise-adapted model, they augmented ECGs with custom noises in four frequency ranges, each emulating real-world noise sources. Both models performed similarly on standard electrocardiograms. But on tests with wearable device noise, the noise-adapted model detected LVSD significantly better.

Until now, AI diagnostic performance was poorer in real-world wearable ECG data compared to data adapted from 12-lead ECGs acquired in clinical settings. These findings may enable earlier detection of cardiomyopathies through scalable screening tools such as wearable devices.

More information: Akshay Khunte et al, Detection of left ventricular systolic dysfunction from single-lead electrocardiography adapted for portable and wearable devices, *npj Digital Medicine* (2023). DOI:

10.1038/s41746-023-00869-w

Provided by Yale University