

OUTCOMES AFTER PRIMARY PCI - 2

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Base Camp to Mount Everest: Milestones in Advancing a Single-Lead for STEMI Detection

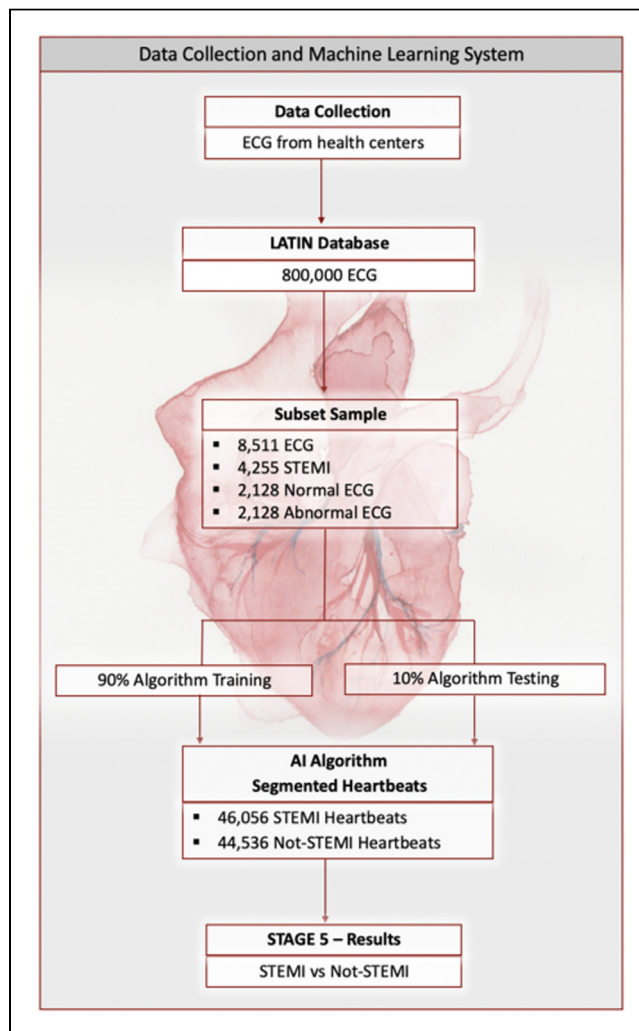


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BACKGROUND The diagnosis of ST-segment elevation myocardial infarction (STEMI) has historically relied on the 12-lead electrocardiogram (ECG) and the expert required to interpret it. STEMI recognition has always been a challenge even for experienced practicing doctors—a hurdle that is aggravated by the deadly and time-dependent condition. With assistance from artificial intelligence (AI), the complex 12-lead ECG can now be updated and simplified.

METHODS To develop an effective single-lead ECG to detect STEMI, the authors performed a series of increasingly technical experiments. Initially, they tested whether an AI algorithm integrated into a 12-lead ECG could detect STEMI. Secondly, the AI algorithm was applied to a single-lead ECG with the same intent. After that, the authors sought to identify which was the best individual single lead. Lastly, they advanced the methodology to localize STEMI. The sample included 8,511 ECG from the Latin America Telemedicine Infarct Network (LATIN) database. Each ECG was applied to train (90%) or test (10%) the algorithm and was segmented into heartbeats. ECG used in the training stage included a diagnosis, which was occulted for the testing phase. In the final step, each heartbeat received a label (STEMI or not-STEMI) according to the algorithm's interpretation.

RESULTS The AI-enhanced single-lead ECG was able to provide an accuracy of 91.9% for STEMI detection (Figure).



CONCLUSION An updated, simplified version of the 12-lead ECG—an AI-enhanced single-lead ECG—may be the future of STEMI detection, with the ability to provide an autonomous and accurate diagnosis, saving time and avoiding errors.

CATEGORIES CORONARY: Acute Coronary Syndromes