

Diagnosing heart attacks: There's an app for that

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An experimental, inexpensive iPhone application transmitted diagnostic heart images faster and more reliably than emailing photo images, according to a research study presented at the American Heart Association's Quality of Care and Outcomes Research Scientific Sessions 2013.

The app could help save lives by speeding treatment for the deadliest type of [heart](#) attack known as STEMI (ST segment elevation [myocardial infarction](#)), in which a clot blocks blood flow to the heart.

A critical step in prompt, effective STEMI treatment is rapid transmission of an electrocardiogram (ECG) image from emergency medical personnel on site with a patient directly to the hospital to be viewed by a doctor. The ECG may show evidence of a heart attack, allowing doctors to prepare for immediate treatment upon the patient's arrival.

Traditionally, ECG images are sent through specialized commercial systems. Some hospitals use cell phones to take photos of ECGs, which require large files to maintain clarity and can be slow and unreliable, particularly in signal-limited environments.

"Simple [cellular technology](#) can save lives," said David R. Burt, M.D., the study's lead author and an associate professor of [emergency medicine](#) at the University of Virginia School of Medicine in Charlottesville. "This system may make pre-hospital ECG transmission a more inexpensive and reliable option. That can translate to faster treatment and saved lives."

In this study:

- [iPhone](#) images were transmitted in 4-6 seconds, compared to 38-114 seconds for actual-size and 17-48 seconds to send a large-size e-mail image.
- The app's failure rate at 120 seconds was

less than 0.5 percent, compared to a 3 percent to 71 percent e-mail failure rate.

Researchers designed the app to take a photo of the ECG, center and reduce its size, while maintaining as much clarity as possible.

They tested the app more than 1,500 times with Sprint, AT&T, and Verizon in an urban area. The researchers are currently testing the app in rural areas with limited cell-phone access and in comparison with commercial proprietary systems.

"In many places, it may be feasible to transmit vital ECGs over commercial cell-phone networks, saving money, and allowing areas without commercial ECG transmission systems to still connect pre-hospital emergency medical services with STEMI treatment centers," Burt said.

Each year in the United States, nearly a quarter of a million people experience STEMI. Survival depends upon immediate treatment to restore blood flow. Yet many patients don't make it to the hospital in time.

The [American Heart Association](#) recommends surgical treatment within 90 minutes of hospital arrival, or clot-busting medication within 30 minutes. The association initiated a national system of treatment and referral centers known as Mission: Lifeline® to help ensure standard of care.

Provided by American Heart Association

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