

# Smartphone app performs better than traditional exam in cardiac assessment

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A smartphone application using the phone's camera function performed better than traditional physical examination to assess blood flow in a wrist artery for patients undergoing coronary angiography, according to a randomized trial published in *CMAJ (Canadian Medical Association Journal)*.

These findings highlight the potential of smartphone applications to help physicians make decisions at the bedside. "Because of the widespread availability of smartphones, they are being used increasingly as point-of-care diagnostics in clinical settings with minimal or no cost," says Dr. Benjamin Hibbert of the University of Ottawa Heart Institute, Ottawa, Ontario. "For example, built-in cameras with dedicated software or photodiode sensors using infrared light-emitting diodes have the potential to render smartphones into functional plethysmographs [instruments that measure changes in [blood flow](#)]."

The researchers compared the use of a heart-rate monitoring application (the Instant Heart Rate application version 4.5.0 on an iPhone 4S) with the modified Allen test, which measures blood flow in the radial and ulnar arteries of the wrist, one of which is used to access the heart for [coronary angiography](#). A total of 438 participants were split into two groups; one group was assessed using the app and the other was assessed using a gold-standard traditional physical examination (known as the Allen test). The smartphone app had a diagnostic accuracy of 94% compared with 84% using the traditional method.

"The current report highlights that a smartphone application can outperform the current standard of care and provide incremental diagnostic yield in clinical practice," writes Dr. Hibbert, with colleagues.

"However, while they aren't designed as medical devices—when smartphones and apps begin to be used clinically—it is important that they are evaluated in the same rigorous manner by which we assess all therapies and diagnostic tests," says lead author Dr. Pietro Di Santo.

"When we designed the iRadialstudy we wanted to hold the technology to the highest scientific standards to make sure the data supporting its use was as robust as possible."

"Although this application is not certified at present for use in [health care](#) by any regulatory body, our study highlights the potential for [smartphone](#)-based diagnostics to aid in clinical decision-making at the patient's bedside," concludes Dr. Hibbert.

The health care profession and regulatory agencies should proactively address the challenges associated with bringing mobile health (mHealth) solutions into practice to maximize their benefits, writes Dr. Kumanan Wilson, of The Ottawa Hospital and the University of Ottawa, in a related commentary.

"Referred to as a new industrial revolution, the impact of digital technologies will be both disruptive and transformative," he writes. "The continued maturation of technologies, such as artificial intelligence, virtual reality and blockchain, will further expand the possibilities for mHealth in both diagnosis and treatment in health care."

"Photoplethysmography using a [smartphone application](#) for assessment of ulnar artery patency: a [randomized clinical trial](#)" is published April 3, 2018.

**More information:** *Canadian Medical Association Journal* (2018).  
[www.cmaj.ca/lookup/doi/10.1503/cmaj.170432](http://www.cmaj.ca/lookup/doi/10.1503/cmaj.170432)

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