

IBM Research, Sutter Health Collaborate to Train Research Models That Could Be Used for Identifying Heart Failure Earlier

ARMONK, N.Y., May 15, 2017 [PRNewswire/](#) -- A team of scientists at IBM (NYSE:[IBM](#)) Research, in collaboration with scientists from Sutter Health, recently completed research developing methods to help predict heart failure based on hidden clues in Electronic Health Records (EHRs). Over the last three years, using the latest advances in artificial intelligence (AI) like natural language processing, machine learning and big data analytics, the team trained models to help predict heart failure.

Today, doctors will typically document signs and symptoms of heart failure in the patient record and also order diagnostic tests that help indicate the possibility that a person may experience heart failure. Despite best efforts, a patient is usually diagnosed with heart failure after an acute event that involves a hospitalization where the disease has advanced with possibly irreversible and progressive organ damage.

The research uncovered important insights about the practical tradeoffs and types of data needed to train models, and developed possible new application methods that could allow future models to be more easily adopted by medical professionals. For example, the research showed that only six of the 28 original risk factors contained within the Framingham Heart Failure Signs and Symptoms (FHFSS²) were consistently found to be predictors of a future diagnosis of heart failure.

In addition, other team findings showed that other data types routinely collected in EHRs (such as disease diagnoses, medication prescriptions and lab tests) when combined with FHFSS could be helpful predictors of a patient's onset of heart failure.

Practical implications of the research were documented in a November 2016 paper "[Early Detection of Heart Failure Using Electronic Health Records](#)" and an editorial "[Learning About Machine Learning: The Promise and Pitfalls of Big Data and the Electronic Health Record](#)" in *Circulation: Cardiovascular Quality and Outcomes*.

All three parties will continue to collaborate to improve accuracy, clinical relevance and to test models for use in clinical care. In addition, the work may have potential application to other diseases. The confluence of the availability of big data and advances in cognitive computing could have dramatic advances in earlier disease detection.

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¹Early Detection of Heart Failure Using Electronic Health Records, *Circulation: Cardiovascular Quality and Outcomes* circoutcomes.ahajournals.org/content/9/6/649

² The Framingham Heart Study and the Epidemiology of Cardiovascular Diseases: A Historical Perspective *NCBI*

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4159698/>

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