

# Genetic risk score card for early prediction of heart disease

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Human heart. Credit: copyright American Heart Association

Scientists are getting closer to being able to predict an individual's genetic risk of heart disease, paving the way for earlier intervention and lifestyle changes.

In research published today in the *European Heart Journal*, funded by the Heart Foundation and NHMRC, Dr Gad Abraham and Associate Professor Mike Inouye from the University of Melbourne have developed a risk score that predicts [coronary heart disease](#) based on DNA profiles.

Currently, risk is calculated through clinical and lifestyle indicators such as blood pressure, cholesterol, and smoking, as well as family history—but, despite advances in genomic technologies, genetics does not yet feature in heart disease risk.

"About half of [heart disease risk](#) is inherited, yet current approaches don't use genetics," Associate Professor Inouye said.

"Our study shows that we can potentially distinguish much earlier in life who is at high risk of heart disease, including heart attack."

The researchers, computational biologists from the University of Melbourne's Centre for Systems Genomics in the School of BioSciences and the Department of Pathology, developed a score based on more than 49,000 Single Nucleotide Polymorphisms, or SNPs—single letters in the [human genome sequence](#) that commonly vary from person to person.

In addition to the early predictive power of the genomic risk score alone, they found that integrating this information with known risk factors improved their ability to predict the risk of developing heart disease 10 years into the future, especially for people over 60 years of age.

"Traditional scores can identify people at very high risk, but without an understanding of the genetics, we still fail to identify a large proportion of people who are going to develop [heart disease](#) over the next 10 years," said Dr Abraham.

The researchers were also able to identify the top 20% of men who were at high lifetime risk, leading to disease 12-18 years earlier than men at the bottom 20% of risk. These high-risk individuals could be candidates for early intervention.

"So far, we've been missing half the picture, but given the great strides being made by genomics in understanding human disease, we expect this approach to one day be part of routine clinical practice," Dr Abraham said.

**More information:** Gad Abraham et al. Genomic prediction of coronary heart disease, *European Heart Journal* (2016). [DOI: 10.1093/eurheartj/ehw450](https://doi.org/10.1093/eurheartj/ehw450)

Provided by University of Melbourne

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