

## 4 risk factors raise probability of developing precursor of heart failure

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Four well-known risk factors for heart attack significantly increased the size of the heart's left ventricle, a key precursor of heart failure, according to a study in *Circulation: Journal of the American Heart Association*.

High blood pressure, excessive weight, smoking and diabetes were strongly correlated with greater size of the heart's left ventricle over the short term (four years) and the long term (16 years) in a study of more than 4,217 people.

"Left ventricular mass has been associated in multiple studies with risk of cardiovascular disease, including risk of developing [heart failure](#). We identified four [risk factors](#) that promote greater cardiac mass over the adult life course. These factors can be directly targeted for prevention and lowering these risk factors, therefore, could potentially lower the burden of heart failure." said Ramachandran S. Vasan, M.D., the study's senior author, a senior investigator at the Framingham Heart Study, and professor of medicine and the chief of the section of [Preventive Medicine](#) at Boston University School of Medicine.

Researchers assessed the effect of risk factors on left ventricular (LV) mass by analyzing longitudinal data from the Framingham (Mass.) Offspring Study. The participants averaged 45 years of age at study entry. Fifty-three percent were women. The Framingham Offspring Study enrolled children of participants of the original Framingham Heart Study, which began in 1948.

Researchers used data obtained at an initial exam in the 1970s and data from follow-up exams conducted at four-year intervals through the late 1990s, and evaluated short-term associations of LV mass using data from 2,605 of the participants.

Study members were divided into three groups: low, intermediate and high numbers of risk factors. High blood pressure, excessive weight, smoking and diabetes strongly correlated with greater left ventricular mass; age, and gender were also associated with heart muscle thickening, researchers said.

"People with fewer risk factors had almost no increase in LV mass with age," Vasan said. "People who had more risk factors had a steeper increase in LV mass with age."

Other findings included:

- In the 16-year risk analysis, women showed a greater and steeper rate of LV mass increase as they aged compared to men, something not found in the short-term analysis.
- People with diabetes — particularly women — had a steep increase in muscle thickening over time, even after adjusting for other risk factors.

In a second *Circulation* article, Vasan, Pencina and others describe a simple "calculator" they devised to predict an adult's 30-year risk of dying due to a coronary or cerebrovascular event or suffering a non-fatal heart attack or stroke.

Researchers analyzed data from 4,506 Framingham Offspring Study members (51.8 percent women, average age 36) at enrollment for "hard"

cardiovascular disease (CVD) events — coronary death, heart attack, and fatal and nonfatal strokes. All participants were free of heart disease and cancer at the time of their first examination (1971). Median follow-up was 32 years. Among the findings:

- Women — free of CVD at baseline — on average had a 7.6 percent 30-year risk of suffering a hard CVD event, after researchers adjusted for other causes of deaths, such as cancer and accidents.
- Men — free of CVD at baseline — on average had an 18.3 percent 30-year risk of such a CVD event after adjustment.
- Standard risk factors, including [high blood pressure](#), cholesterol levels, smoking and diabetes, significantly increased an individual's long-term CVD risk.
- Excessive weight, as measured by body mass index was a statistically non-significant predictor of CVD events in the short-term observation period, but became significant over 30 years.
- Thirty-year risk estimates, made by extrapolating existing 10-year cardiovascular risk models, proved inadequate predictors of long-term risk.

The interactive calculator "will enable physicians to enter patient data and obtain the 30-year risk estimates for their patients," said Michael J. Pencina, Ph.D, the study's first author and an associate professor of biostatistics at Boston University. "My hope would be that we can increase awareness of cardiovascular risk in younger people, who may have lower 10-year risks but higher 30-year risks, and encourage them to take steps to maintain optimal levels of their risk factors."

For example, a 25-year-old woman who smokes and has hypertension and high-risk cholesterol levels has a 1.4 percent risk of suffering a hard CVD event by age 35 (10 years of follow-up), but her risk is 12 percent by age 55 (over a 30-year period).

Source: American Heart Association ([news](#) : [web](#))

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