

# Simplified heart-risk guideline may miscalculate risk for millions

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A method that is widely used to predict the risk of a major coronary event may over- or underestimate risk for millions of Americans, according to a study directed by a researcher at the San Francisco VA Medical Center and the University of California, San Francisco.

The method in question is the simplified version of the so-called Framingham model, which is used to estimate a patient's 10-year risk of a heart attack, stroke, or other coronary event based on risk factors such as age, [cholesterol levels](#), blood pressure, and smoking. National guidelines recommend using the risk estimates generated by the Framingham model to classify patients as among one of three risk groups. Guidelines recommend more aggressive strategies to treat cholesterol in patients classified into higher-risk groups.

The original Framingham model uses a complicated mathematical equation to calculate risk, while the simplified version is based on a point system, with a certain number of points for each risk factor.

"We thought there might be significant differences between the two methods, which would have significant impacts on how people are treated for cholesterol," says principal investigator Michael Steinman, MD, a physician at SFVAMC and an assistant professor of medicine at UCSF. "And in fact, that turned out to be the case."

For the study, which appears in the Online First section of the "[Journal of General Internal Medicine](#)," the researchers assessed data from 2,543

subjects who participated from 2001 to 2006 in National Health and Nutrition Examination Surveys sponsored by the [Centers for Disease Control and Prevention](#). The subjects were chosen to be representative of 39 million adults in the United States for whom guidelines recommend using the Framingham method to predict future cardiovascular risk.

For each subject, the researchers calculated risk based on the original Framingham model and on the simplified model, and compared the differences, "which turned out to be substantial for many patients," says Steinman, who is senior author of the paper.

Under the point-based system, 15 percent of the subjects were classified as being at a different level of risk than they were under the original model. Nationwide, say the authors, 5.7 million Americans would be placed into different risk groups using the point-based model than they would be using the original model, with 3.9 million misclassified into higher risk groups and 1.8 million misclassified into lower risk groups.

"Across the group, on average, these statistical differences balance out," says Steinman. "But for individual patients, they are potentially important. A lot of individuals would be treated differently - either more aggressively or less aggressively - using the point-based model."

Steinman notes that the point-based model, which can be completed in a few minutes with pen and paper, was introduced over a decade ago, when computers and personal digital assistants were less powerful and not so common in private medical practices.

"While the point-based system is a substantial improvement over having no standardized method for predicting risk, just about any computer or PDA in use today can calculate the original Framingham model," says Steinman. "This means that your doctor can calculate your risk just as

easily using the complex equation, which is likely to be more accurate than the point-based system. So there's not much reason to use the point-based system anymore in most instances."

Steinman cautions that the study was not designed to determine the benefits or harms for individuals who would be treated differently based on the results of the two models.

The study authors note that the next generation of cholesterol guidelines is expected to be released in the near future, and that point-based versions of the new risk model have already been developed, which may result in similar misclassifications.

"With risk prediction models being increasingly used for many different diseases and conditions, this could be a general problem in the field of medicine," predicts Steinman. "In creating simplified risk models, we have to be aware of the potential impact on individual patients."

Provided by University of California - San Francisco

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