

New guidelines for statin eligibility improve prediction of cardiovascular risk

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The new guidelines for determining whether patients should begin taking statins to prevent cardiovascular disease issued in 2013 by the American College of Cardiology (ACC) and the American Heart Association (AHA) are more accurate and more efficient than an earlier set of guidelines in assigning treatment to adults at increased risk for cardiovascular events - including heart attacks and strokes - and identifying those whose low risk rules out the need to take statins.

In their paper appearing in the July 15 issue of *JAMA*, a team led by Massachusetts General Hospital (MGH) investigators also reports that statin-eligibility designated by the new guidelines better matches risk levels indicated by the presence of [coronary artery](#) plaque. The non-contrast form of cardiac CT scanning called calcium scoring the team used to measure coronary plaques may be able to further improve the accuracy of the ACC/AHA guidelines.

"Using 10-year follow-up data from asymptomatic patients enrolled in the Framingham Heart Study, our paper demonstrates that these new guidelines - which represent a shift in the treatment approach for primary prevention of [cardiovascular disease](#) - indeed improve identification of adults at higher risk for future [cardiovascular events](#) who were not captured by previous guidelines," says Udo Hoffmann, MD, MPH, Director of the Cardiac MR PET CT Program in the MGH Department of Radiology and the Division of Cardiology; corresponding author of the *JAMA* paper. "Extrapolating our results to the approximately 10 million U.S. adults who would be newly eligible for

[statin therapy](#) under the new guidelines, we estimate that between 41,000 and 63,000 cardiovascular events - heart attacks, strokes or deaths from cardiovascular disease - would be prevented over a 10-year period."

The ACC/AHA guidelines differ from guidelines issued in 2004 by the National Cholesterol Education Program - the ATP (Adult Treatment Program) III guidelines - by focusing specifically on the use of statins to prevent cardiovascular disease by lowering LDL cholesterol, instead of including several different classes of drugs as the ATP III guidelines did, and broadening the prevention focus to all cardiovascular diseases instead of only heart disease. To compare the two guideline sets, the investigators analyzed data from study groups comprised of the children and grandchildren of participants in the original Framingham Heart Study. Participants aged 35 and older for men or 40 and older for women, who had no known cardiovascular disease, had been assigned to have a cardiac CT scan at study visits taking place between 2002 and 2005. The research team examined how well both sets of criteria predicted the risk of cardiovascular events through the end of the study period in 2013.

While the ACC/AHA guidelines would have indicated statin-eligibility in nearly three times as many participants that the ATP III guidelines would - 39 percent versus 14 percent - similar percentages of both groups actually experienced cardiovascular events during the study period - 6.3 percent for those meeting ACC/AHA criteria and 6.9 percent for those meeting ATP III criteria. The ACC/AHA criteria did a better job of indicating a low risk of cardiovascular events, which occurred in only 1 percent of those who did not meet those criteria but in 2.4 percent of those not meeting ATP III criteria. Among participants who were categorized by what are called Framingham Risk Scores as at intermediate risk for cardiovascular events - a group for whom determining whether to start statin therapy is particularly challenging - ACC/AHA guidelines were significantly better at identifying those who

should receive the drugs.

The new guidelines have been expected to increase the number of statin-eligible adults by almost 13 million, raising some concerns that many individuals would be exposed to the risks of statin therapy without justification. However, Hoffmann and his team showed that the 598 study group participants who would be designated statin-eligible by ACC/AHA but not ATP III criteria had the same risk of cardiovascular events over 10 years as those who were statin-eligible under the older criteria. Based on the reported effect of statins to prevent between 30 and 45 percent of future cardiovascular events, the researchers estimate that between 39 and 58 patients would need to be newly assigned to take statins to prevent a single cardiovascular event.

The cardiac CT scans revealed some level of coronary artery calcification (CAC) - arterial plaque that can solidify and narrow blood vessels leading to a heart attack - in 42 percent of study participants, with high levels in 8 percent. Among those with high-risk CAC levels, 85 percent would have been statin-eligible under ACC/AHA criteria compared with 34 percent by ATP III criteria. Around one third of those determined to be statin eligible by either set of criteria were found to have no coronary artery calcium, and the use of a CAC score of 0 to rule out statin eligibility would not increase the incidence of cardiovascular events for either group.

"Our study shows that the ACC/AHA guidelines for statin eligibility aligned with risk levels indicated by CAC scores much better than the ATP III guidelines, providing a potential explanation for the improved prediction of cardiovascular risk." says Hoffmann, a professor of Radiology at Harvard Medical School. "However, 93 percent of those designated statin-eligible by ACC/AHA criteria would not be expected to have a cardiovascular event during the next 10 years, while nearly 30 percent of those with coronary calcification would not be captured by

the new [guidelines](#) as statin eligible. That indicates that calcium scoring could be used to further improve our ability to identify people at truly high or low risk for cardiovascular events."

More information: *JAMA*, [DOI: 10.1001/jama.2015.7515](https://doi.org/10.1001/jama.2015.7515)

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