Calcium Score Improves CHD Risk Prediction

BY MARY ANN MOON

Adding the coronary artery calcium score to traditional risk factors significantly improved asymptomatic patients' risk classification for coronary heart disease, in an analysis of the Multi-Ethnic Study of Atherosclerosis.

"Incorporation of an individual's CACS leads to a more refined estimation of future risk of CHD events than [do] traditional risk factors alone," said Dr. Tamar S. Polonsky of Northwestern University, Chicago, and associates.

However, this finding "will need to be validated in additional populations" before CACS can be adopted into routine clinical practice, they noted. More importantly, it still hasn't been determined

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whether screening for subclinical disease using CACS actually improves patient outcomes, they cautioned.

In an editorial comment accompanying this report, Dr. John P.A. Ioannidis of the University of Ioannina (Greece) and Harvard School of Public Health, Boston, and Ioanna Tzoulaki, Ph.D., of Imperial College of Medicine, London, agreed that these study results, "no matter how promising, do not suffice to recommend this marker for widespread routine use."

In addition to the clinical utility of obtaining the CACS, the considerable cost of the procedure and its potential harms due to radiation exposure must be thoroughly examined. "The evidence to date suggests that while CACS is a promising tool, the verdict is not yet in as to whether it is ready for routine use, and much more is still left to do," wrote Dr. Ioannidis and Dr. Tzoulaki (JAMA 2010;303:1646-7).

Dr. Polonsky and colleagues assessed CACS using data from the Multi-Ethnic Study of Atherosclerosis, a cohort study of more than 6,800 white, black, Hispanic, and Chinese Americans aged 45-84 years who had no known cardiovascular disease at enrollment in 2000-2002. For their study, the investigators included 5,878 of these subjects who had undergone CT scanning for coronary calcium assessment at baseline and who had been followed every 9-12 months for a median of 6 years.

There were 209 CHD events during follow-up, including 96 MIs and 14 CHD deaths.

Adding CACS to the risk prediction model resulted in the reclassification of 26% of the sample. "Overall, 728 individuals in the entire cohort were reclassified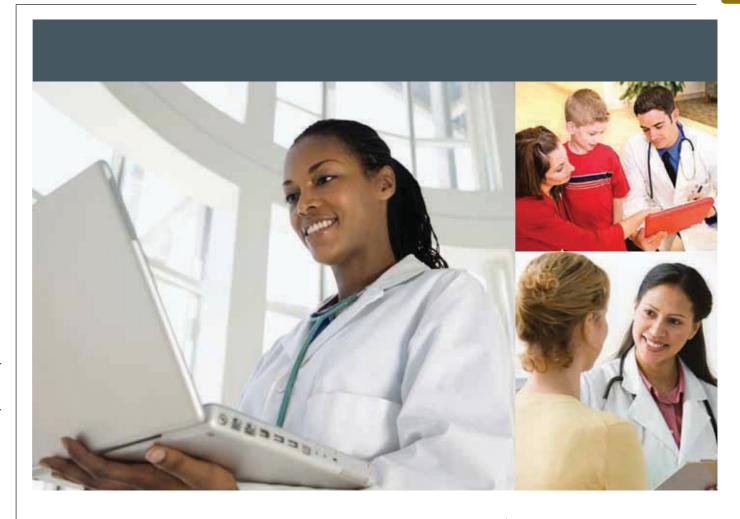 to a higher risk category, with an event rate of 8.7%, and 814 were reclassified to a lower risk category, with an event rate of 2.7%," Dr. Polonsky and her associates said (JAMA 2010;303:1610-6).

An important measure of a risk marker's usefulness "is whether it separates individuals into more clinically relevant risk categories. Ideally, a model would reclassify most of the individuals out of the intermediate-risk group and into the highest or lowest risk categories."

Adding CACS to the risk prediction model placed 77% of the total study population into definitive highest-risk or lowest-risk categories, where treatment strategies are more straightforward, as opposed to the somewhat nebulous "intermediate risk" category. In comparison, only 69% of the study population was classified as highest or lowest risk when CACS was not added to the model.

A caveat: Patients in this study classified as low risk using CACS actually had an event rate that was higher than was predicted by the model. Therefore an important portion of patients thought to be at low risk did experience a coronary event. This study was supported by the National Heart, Lung, and Blood Institute and the National Center for Research Resources. Dr. Polonsky's associates reported receiving support from Pfizer and GE/Toshiba. ■