COMMENTARY

MORTEZA NAGHAVI, MD*
Association for Eradication of Heart Attack, Houston, TX; Chairman, Screening for Heart Attack Prevention and Education (SHAPE) Task Force

HARVEY S. HECHT, MD
Department of Interventional Cardiology, Lenox Hill Hospital, New York; Editorial Committee, Screening for Heart Attack Prevention and Education (SHAPE) Task Force

Vulnerable patients are between a 'ROC and a hard place': Yes, it's time to screen for coronary artery disease

IN THE SEPTEMBER 2007 issue of the *Cleveland Clinic Journal of Medicine*,[1] Dr. Michael Lauer argued for retaining the status quo and rejecting the recently proposed Screening for Heart Attack Prevention and Education (SHAPE) guidelines.[2] As authors of the SHAPE guidelines, we would like to address his arguments.

SCREENING FOR DISEASE RATHER THAN RISK FACTORS

Atherosclerotic cardiovascular disease is still the leading cause of death and morbidity in the United States and is achieving similar status in the rest of the world.[3] Traditional strategies for primary prevention based on detecting risk factors are inadequate, because an individual patient's risk factors may not tell us if disease is truly present or how severe it is.

The Association for Eradication of Heart Attack proposed the SHAPE guidelines on the basis of consensus among an international group of experts.[2] After reviewing all available evidence, the group recommended that all asymptomatic men 45 to 75 years of age and women 55 to 75 years of age (except for those at very low risk) undergo noninvasive screening for subclinical atherosclerosis, with the goals of treatment to be determined by the amount of subclinical atherosclerosis detected, rather than by risk factors.

REBUTTING THE ARGUMENTS AGAINST THE SHAPE GUIDELINES

Dr. Lauer presents two main arguments against adopting the SHAPE guidelines: lack of evidence and conflicts of interest.

'Lack of evidence'

Dr. Lauer emphasizes that we have no evidence that screening for subclinical atherosclerosis reduces the incidence of clinical events, as we do for other widely used screening programs (breast cancer, abdominal aortic aneurysm, colon cancer). This assertion is unfortunately correct but ignores the following critical issues:

- The traditional approach that Dr. Lauer strongly advocates, which is based on risk factors and the Framingham Risk Score, has also never been shown in randomized controlled trials to improve clinical outcomes.
- The two measures of atherosclerosis that SHAPE proposes be used in risk assessment, the coronary artery calcium score and the carotid intima media thickness, have been consistently shown to have prognostic power superior to that of the Framingham Risk Score by fulfilling the unequivocal epidemiologic requirement of having a significantly greater area under the receiver operating characteristic (ROC) curve.[4] If neither the coronary artery calcium score nor the Framingham Risk Score has outcome data to support it, why not use the one with the greater prognostic power?
- The coronary artery calcium score and carotid intima media thickness are precise tools that measure subclinical atherosclerosis in much the same way that the universally accepted tools of echocardiography,

The authors of the SHAPE guidelines address Dr. Lauer's arguments

*Dr. Naghavi has disclosed that he owns stock in the Volcano Corporation and in Endothelix, Inc.

myocardial perfusion imaging, magnetic resonance imaging, and coronary arteriography provide information in their respective domains. Contrary to what most cardiologists would assume, none of these tests has ever been shown to affect outcomes in the manner called for by Dr. Lauer, in whatever area they have been applied. Nonetheless, they are endorsed by all specialty societies because of the invaluable information they provide. Granted, these tools have not been proposed for screening, but the logic is still the same.

In a medical arena in which the most commonly used technologies totally lack evidence that they improve outcomes, why hold screening for subclinical atherosclerosis to a different standard?

- At the beginning of his paper, Dr. Lauer describes a patient who seems to be at low risk of coronary artery disease on the basis of his Framingham Risk Score. But suppose this patient undergoes coronary artery calcium screening and has a very high calcium risk score (> 400). In this case, would Dr. Lauer ignore the test and continue to treat him by low-risk guidelines? Because such patients can never be randomized to undergo less-aggressive treatment once they are found to be at high risk, the randomized controlled trial that Dr. Lauer insists upon would be unethical and will never be done. Moreover, the estimated $100 million cost and 10-year duration of such a trial are overwhelmingly prohibitive, and neither the National Institutes of Health nor the pharmaceutical industry has shown any interest in conducting such a trial.

Patients are stuck between the 'ROC' of demands for evidence and the 'hard place' of the status quo

'Conflicts of interest'

Financial motives for the SHAPE guideline have been imputed because the *American Journal of Cardiology* supplement that contained the guidelines was supported by the Pfizer Corporation, and because some of the authors participate in private imaging centers that might benefit from coronary artery calcium screening. Indeed, Dr. Steven Nissen, the immediate past President of the American College of Cardiology, has called the authors "shameless self-promoters"![5]

This characterization is grossly unfair: none of the authors received a cent of support for their efforts, all have disclosed their potential conflicts of interest, and we had no financial expectation from implementation of the guidelines.

STATUS QUO IS UNACCEPTABLE

In summary, we hope that practitioners will ignore the efforts of those who would delay the implementation of the most powerful screening tool for coronary artery disease currently available. Dr. Lauer demands a level of evidence that has never been provided in any area of cardiology. Furthermore, screening has already been endorsed by the American College of Cardiology and American Heart Association for use in the intermediate-risk population.[6]

The millions of people at risk of heart attack should not be stuck between the "ROC" of demanding impossibly stringent evidence in support of coronary artery calcium screening and the "hard place" of the unacceptable status quo. ■

REFERENCES

1. **Lauer MS.** Screening for coronary heart disease: has the time for universal imaging arrived? Cleve Clin J Med 2007; 74:645–656.
2. **Naghavi M, Falk E, Hecht HS, et al.** From vulnerable plaque to vulnerable patient—part III: executive Summary of the Screening for Heart Attack Prevention and Education (SHAPE) Task Force. Am J Cardiol 2006; 98:2H–15H.
3. **Yusuf S, Reddy S, Ounpuu S, Anand S.** Global burden of cardiovascular diseases, part II: variations in cardiovascular disease by specific ethnic groups and geographic regions and prevention strategies. Circulation 2001; 104:2855–2864.
4. **Greenland P, LaBree L, Azen SP, Doherty TM, Detrano RC.** Coronary artery calcium score combined with Framingham score for risk prediction in asymptomatic individuals. JAMA 2004; 291:210–215.
5. **Wood S.** Texas bill allows insurance coverage for calcium screening, carotid ultrasound. Medscape. www.medscape.com/viewarticle/552341. Accessed 08/28/2007.
6. **Greenland P, Bonow RO, Brundage BH, et al.** ACCF/AHA 2007 clinical expert consensus document on coronary artery calcium scoring by computed tomography in global cardiovascular risk assessment and in evaluation of patients with chest pain. J Am Coll Cardiol 2007; 49:378–402.

ADDRESS: *Morteza Naghavi, MD, 8275 El Rio, No. 100, Houston, TX 77054; e-mail mn@vp.org.*