

## The Utilization of Cardiac Imaging

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Cardiac imaging with echocardiography and radionuclide techniques has played an increasingly important role in cardiovascular care over the past decade. Cardiac imaging is currently undergoing rapid evolution. Cardiac magnetic resonance (MR), cardiac computed tomography (CT), and combined positron emission tomography/CT or single photon emission computed tomography/CT scanners offer great promise for the assessment of coronary artery atherosclerosis and myocardial pathophysiology and histopathology, as well as a wide range of cardiovascular conditions. All of these areas have enjoyed important technical advances over the past 5 years that have greatly improved their capabilities and their potential applications. All are the focus of important ongoing research.

At the same time, concern is growing about the potential contribution of cardiac imaging costs to the overall increase in societal healthcare costs. The Medicare Payment Advisory Committee's report to Congress in March 2005 expressed concern about the recent apparent increase in the use of imaging services within the Medicare program and suggested several steps for reform. Other third-party payers have expressed similar concerns and have begun to take action. Recently, Massachusetts Blue Cross and Blue Shield announced a new program for prescreening of certain imaging tests in the face of a 20% increase within the past year in the use of MR and CT. Both patients and physicians have been the subjects of advertising campaigns, particularly for free-standing imaging centers, that have often included marketing claims that may overstate the currently available scientific evidence supporting these new techniques. Like many other areas of evolving biomedical technology, the scientific evidence is still under development.

Current scientific evidence to justify widespread use of these new techniques in broad clinical populations remains undefined. There are, therefore, a limited number of recommendations for MR (eg, stress perfusion MR), CT (eg, coronary CT angiography or calcium scoring), or combined

nuclear/CT scanning in existing American Heart Association (AHA) guidelines.

For example, coronary calcification assessed by CT was identified in AHA Prevention Conference V as potentially useful in asymptomatic middle-aged patients who are found to be at intermediate risk (10% to 20% risk of cardiovascular death/myocardial infarction in 10 years) by the Framingham risk score. The conference proceedings indicated that "selected use . . . in a patient with intermediate coronary risk may be appropriate."<sup>1</sup> Such focused testing can help define which patients in this group merit more aggressive risk factor modification to prevent subsequent cardiovascular events. Published data would suggest, however, that this technique increasingly has been applied to the much larger population of asymptomatic patients who are at low risk according to the Framingham risk score. Such testing has at times led to additional steps, including coronary angiography and percutaneous coronary intervention, that generally are not recommended in such patients by American College of Cardiology/AHA clinical practice guidelines. At present, no evidence indicates that additional testing or revascularization in such low-risk patients improves their outcomes, which are sufficiently good with risk factor modification alone.

The AHA believes that the future development of these imaging modalities must strike a proper balance between the development of their scientific potential, and their premature clinical use. We support the following principles in the development and use of existing and emerging cardiac imaging modalities:

1. Imaging studies should be performed by physicians who meet published standards of training and experience from medical societies accredited by the Accreditation Council for Graduate Medical Education.
2. These procedures should be performed in high-quality laboratories with appropriate facilities and technical personnel who are adequately trained in imaging procedures and related safety standards.

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3. Rigorous scientific research should continue to critically examine these emerging modalities and define both their advantages and limitations. The AHA would encourage studies comparing emerging techniques to existing, less expensive technology.
4. Emerging imaging modalities should be fully incorporated into ongoing efforts to improve the overall quality of cardiovascular care and compliance with existing clinical practice guidelines. For example, the identification of asymptomatic intermediate-risk patients (10% to 20% risk of cardiovascular death/myocardial infarction in 10 years) with atherosclerosis *must* be followed by appropriate risk factor treatment according to existing AHA guidelines.
5. Clinical investigation of the application of these modalities should not examine their use in isolation, but rather in association with all other available clinical data about the patient, to determine not only their true *incremental* effect on clinical decision making, but also their potential for additional downstream risks and costs.
6. Rigorous criteria for appropriateness should be developed for all cardiac imaging techniques by expert committees that include imaging experts, healthcare quality experts, practicing cardiologists and experienced subspecialists who are not imaging experts, practicing general physicians, and third-party payers.

The available data do not permit a careful scientific assessment of how many of the current cardiac imaging studies are appropriate. At least some of the imaging studies currently performed may be inappropriate and unnecessary, adding to healthcare costs. It is also likely that many patients who would benefit from imaging do not undergo these studies. The exact balance between these two offsetting effects cannot be established at this time. The AHA supports the careful application of cardiac imaging studies in a systems-based approach to improve the overall quality of cardiovascular care and thereby reduce morbidity and mortality from cardiovascular disease and stroke.

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## Authors' Disclosures

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This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire which all members of the writing group are required to complete and submit.

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