Invited Commentary

Widespread Implementation of Appropriate Use Criteria for Cardiac Imaging—Which Are “Appropriate”?

Robert C. Hendel, MD

For more than a decade, organizations such as the American College of Radiology (ACR) and the American College of Cardiology Foundation (ACCF) have published criteria delineating the appropriate use of cardiac imaging. These specialty society guidance documents are designed to provide clinicians with recommendations regarding the use of imaging and are focused on reducing unnecessary and inappropriate testing. In general, both the ACR and ACCF use similar methods in the construction of appropriate use criteria (AUC), by performing careful evidence reviews and providing a standardized rating of multiple clinical indications by the use of the UCLA/RAND methodology with a modified Delphi approach. However, substantial methodological differences exist between each organization’s approach to AUC, including the ACCF’s greater reliance of risk stratification based on clinical factors, which results in a far greater specificity of clinical indications with the ACCF version. Furthermore, the hierarchical nature of the ACCF AUC readily lends these criteria to be adopted into clinical decision support tools.

In this issue of JAMA Cardiology, Winchester et al² compare 2 sets of appropriate use criteria, one derived from the ACR and the other led by the ACCF. Substantial discordance in appropriateness categorization was noted (22.3%), and more complete “coverage” of all clinical situations was demonstrated with the ACCF AUC. A significant limitation of this article relates to the use of an older version of the ACCF AUC. This single-modality set of AUC was published 7 years ago³ and has largely been superseded by the 2013 multimodality AUC,⁴ which should serve as the current standard for the evaluation of appropriate use. While many indications were rated similarly with regard to radionuclide imaging, several important differences in appropriateness classification were noted, including the appropriateness of radionuclide imaging after CABG, the value in high-risk asymptomatic individuals, and its use in the preoperative assessment of patients before intermediate-risk surgery.⁵

A concern raised by Winchester et al² is the finding that there were far more abnormal imaging studies or individuals with ischemia with an inappropriate designation from the ACR (35.4% and 17.5%, respectively) than with the ACCF AUC (7.3% and 2.6%, respectively). Although it is well described that studies designated as inappropriate may still have abnormal test results, as reported in 6 trials,⁶ the fact that the frequency may be higher using the ACR criteria is worrisome.

Another important consideration related to the use of AUC is how often testing for inappropriate indications provides useful prognostic information, thus potentially supporting the recommendation not to perform a test for an inappropriate indication. Data are now becoming available, including studies such as those by Doukky et al,⁶ which demonstrate that the true predictive power of radionuclide imaging regarding the identification of patients at risk for a subsequent cardiac event lies in the population who undergo appropriate testing, not when radionuclide imaging is applied for inappropriate indications. To my knowledge, no such data have been provided using the ACR criteria, and based on the discrepancies between the 2 sets of AUC and the substantially higher incidence of abnormal single-photon emission computed tomography studies performed for ACR inappropriate indications, it seems reasonable to conclude that there may be performance issues related to the use of the ACR criteria for this purpose.

It is critical to recognize that the mere creation of these AUC, regardless of the source, is almost certainly insufficient to promote change in utilization. It must first be shown that the levels of appropriate use can successfully be tracked using a specific set of AUC, so as to demonstrate current performance and permit initiatives to be developed to improve imaging utilization. Notably, there are multiple publications demonstrating the feasibility of tracking AUC using the ACCF criteria but very limited literature regarding the use of the ACR AUC. Publications over the last 10 years, which include more than 20 000 patients, have revealed that appropriate utilization of cardiac imaging may be successfully assessed using the ACCF AUC,⁵ with very few gaps in appropriateness determination through the entire spectrum of patient presentations. Furthermore, tools must be available to place this valuable information directly in the hands of the clinician and ideally provide guidance at the time of test ordering. This has now been shown in several cohorts using the ACCF AUC.⁵,⁶,⁷

Despite efforts to promote utilization of AUC and encourage practitioners to be mindful of utilization patterns, neither set of AUC has been fully incorporated into clinical practices, and are incompletely used by radiology benefits managers, who often develop their own, non-provider-based criteria. The opportunities provided by AUC implementation appear great and offer situations for tracking provider practice to support continuous quality improvement and to provide education for active practitioners and trainees alike. Recent federal legislation will undoubtedly alter the current landscape and may impact whether published, adjudicated AUC are fully implemented by all payers.

The Protecting Access to Medicare Act of 2014 (which became law on April 1, 2014) mandates the use of AUC for advanced cardiac imaging, including nuclear cardiology, cardiac magnetic resonance, and cardiac computed tomography, for all Medicare beneficiaries.⁸ The current program by the Centers for Medicare & Medicaid Services (CMS) requires the selection of a provider-led entity’s AUC and the subse-
quent incorporation of these AUC into a clinical decision support system, with the actual rollout of this mandatory AUC process in 2018. The program will provide for self-evaluation of the appropriateness of clinician practice patterns when ordering advanced imaging services, and after a 2-year to 3-year period of data collection, outliers will likely be subject to obtaining authorization before the performance of advanced cardiac imaging.

The CMS has now begun the AUC selection process, and it is possible that multiple AUC will be selected. However, one of the key issues confronting the CMS is which AUC should be used, a concern supported by the present publication. Winchester et al2 provide crucial information regarding the potential value of each set of AUC. Notably, near-complete assessment of all cases was found with the ACCF AUC, but 18.9% of the participants in this trial could not be assigned an AUC indication using the ACR approach. Furthermore, there was discrepancy between the 2 sets of AUC in 22.3% of patients, although it is not possible to say which criterion was “correct.”

It is apparent in the age of value-based care, and with continued emphasis on elimination of unnecessary procedures and costs, that AUC offer substantial opportunity to optimize care via guidance provided from careful analysis of published data. The AUC are not intended to be guidelines but should provide a mechanism to inform practitioners on “reasonable” technology utilization. However, to alter the current state, these criteria must be well constructed and validated. Furthermore, AUC selected by the CMS and other payers to assist clinicians should find their way into the standard workflow and offer continuing education through clinical decision support, as is the plan by the CMS. Hopefully, this approach can also be successfully implemented by health systems and additional payers, with the goal of optimizing patient care with a realization of resource utilization and cost.

ARTICLE INFORMATION

Author Affiliations: Department of Medicine, University of Miami Miller School of Medicine, University of Miami Hospital, Miami, Florida; Department of Radiology, University of Miami Miller School of Medicine, University of Miami Hospital, Miami, Florida.

Corresponding Author: Robert C. Hendel, MD, Department of Medicine, University of Miami Miller School of Medicine, University of Miami Hospital, 1400 NW 12th Ave, Miami, FL 33133 (hendel@med.miami.edu).


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REFERENCES


