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EDITORIAL COMMENT

Physician-Preferred Versus Policy-Based Testing

Where Do Appropriate Use Criteria Fit In?*

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"It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has."

—Sir William Osler (1)

Coronary artery disease (CAD) is the leading cause of morbidity and mortality in the United States, accounting for 800,000 myocardial infarctions and 1 of every 5 deaths in 2009 (2). The overall annual costs of CAD to the U.S. healthcare system are enormous, and estimated to be upward of $500 billion annually. These findings highlight the need for better evaluation of persons at risk for CAD events. Currently, a multitude of noninvasive imaging modalities are available for evaluation of patients with suspected CAD, and include stress

See page 297

echocardiography (SE), myocardial perfusion single-photon emission computed tomography (CT), positron emission tomography, coronary CT angiography, and cardiac magnetic resonance imaging. These tests are employed for an array of reasons, including, but not limited to, their high diagnostic performance, enhanced risk prediction, and lengthy "warranty period" after a normal test (3).

Yet the penchant for use of these testing modalities has resulted in an unbridled consumption of CAD imaging resources. Diagnostic imaging has increased more rapidly than any other aspect of care, with use of noninvasive stress imaging procedures among Medicare beneficiaries proliferating at an annual increase of 6.1% between 1993 and 2001—a rate that was 3-fold higher than growth for invasive coronary angiography and revascularization (4). Across physician specialties, cardiologists represented the group with the greatest growth in consumption. Although this rate of growth has lessened over recent years, concerns about excess utilization have remained.

Pursuant to this, the American College of Cardiology (ACC) convened an Appropriate Use Criteria (AUC) Task Force to classify commonly used cardiac imaging tests—stratified by specific clinical scenarios—as appropriate, inappropriate, or uncertain (5). The concepts that underscore the AUC are that appropriateness should be an essential component of the decision-making process as to whether to perform testing. Although the ACC's AUC are widely published and readily available to cardiologists, their awareness and incorporation into daily use is strictly optional, and as such, the impact of AUC on testing patterns remains unknown.

In this issue of *iJACC*, Willens et al. (6) examined at an academic medical center a single CAD imaging modality—namely, stress echocardiography (SE)—for important issues related to AUC. In particular, they: 1) examined temporal changes in appropriateness for ordered SEs when classified by the 2008 SE ACC AUC to the more contemporary 2011 SE ACC AUC; 2) performed a comparison of ACC AUC to the criteria of 2 radiology benefits managers (RBMs); and 3) determined the effective-

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ness of an educational-based initiative for improving ACC AUC adherence.

Willens et al. (5) noted that 25% of ordered SEs were considered in different ACC AUC categories in 2008 versus 2011, with the percent of unclassifiable clinical indications reduced from ~10% to 1%. Myriad reasons may explain these findings, including an evolution of AUC that iterates from its application and feedback from its users, as well as ensures its maximal applicability to daily clinical practice. Given the relatively short time frame in which the ACC AUC updates have occurred, a contrary (and perhaps less attractive) explanation to the reduced number of unclassifiable indications may be that the scenarios embodied within the AUC have been expanded at a rate that outpaces the development of high-quality scientific evidence. The most recent initiative of the ACC AUC Task Force will address both of these potential explanations by development of an AUC that encompasses all testing modalities capable of CAD diagnosis in an as rigorous and evidence-based fashion as possible. This multimodality AUC—expected for publication this year—will homogenize appropriate use categories across different test types in an easy-to-apply manner, and Willens' data (6) suggest that the scenarios addressed in the multimodality application will encompass nearly all commonly used clinical applications.

Further, Willens et al. (6) examined the resemblance of the SE ACC AUC to the criteria used by 2 large RBMs, noting that the correlation was generally only fair (0.36 and 0.63). These findings are also of high import, and underscore an increasing quandry for practicing cardiologists. The RBMs are employed by private payer plans and require pre-authorization of CAD imaging tests such as SE using a process by which a physician seeks "permission" to perform a test to ensure test coverage. Based on algorithms that are variably based upon ACC AUC, RBMs either approve or deny coverage of an imaging study. If denied, an ordering physician may appeal to the medical director of an RBM, who will either approve or re-deny pre-authorization.

Although the use of RBMs has been effective for cost reduction to payer plans, these requirements have drawn criticism from practitioners and physician specialty societies for a multitude of reasons. Differences in pre-authorization requirements from ACC AUC as well as across different RBMs are often not publicly shared, and may differ even within the same geographical region, thus promoting a sense of frustration in practicing physicians who contend that the lack of transparency engenders confusion in daily practice (7). In this regard, the ACC AUC may serve as a potentially useful adjunct (or even substitute) to RBM policy by empowering physicians to utilize imaging through integration of the available scientific evidence and expert consensus, and delivered through concise guidance documents.

The potential effectiveness of the AUC has been considered before, albeit in a therapeutic context rather than a diagnostic one. Hemingway et al. (8) examined 2,552 consecutive patients undergoing invasive coronary angiography at 3 hospitals for appropriateness of revascularization (either percutaneous coronary intervention [PCI] or coronary artery bypass graft surgery) based on clinical indication, and followed up for 30 months (8). Among one-third of 908 patients for whom PCI was judged appropriate yet who did not undergo PCI, a 2-fold higher rate of persistent angina was observed when compared to patients who underwent PCI. Similarly, among 1,353 patients for whom coronary artery bypass graft surgery was considered appropriate, the 26% who were treated without that surgery were 4 times more likely to have myocardial infarction or to die, and 3 times more likely to have angina.

In the Hemingway study (8), appropriateness ratings were graded in an even more granular fashion than summary measures of appropriate, uncertain, or inappropriate—similar to the ACC AUC—on a continuous scale from 1 to 9. Importantly, risk of adverse events was observed to increase linearly in accordance with numerical rankings, thus providing compelling data that the category of "uncertain," as was pointed out by Willens et al. (6), represents a "gray zone" where performance of a test such as SE may be clinically indicated for specific patients. Yet in their study, SE indications inclusive of the uncertain category would have been denied 13% and 42% of the time by RBMs. This finding is worthy of consideration, given that it speaks to the issue of physician-preferred, rather than policy-based, testing. When confronted with a symptomatic patient with suspected CAD, the practitioner relies on myriad factors that determine his or her decision to proceed with further testing. As encouraged by Sir William Osler, "The good physician treats the disease; the great physician treats the patient who has the disease" (9). Algorithmic flow charts are useful for general guidance, but can never be a substitute for the art of medicine.

Yet Willens et al. (6) identified a potential impediment to allowing practitioners unchecked authorization for ordering imaging studies. Even after oral, written, and electronic educational initiatives, the number of inappropriate SEs did not decrease in their study, and represented approximately one-third of all SEs ordered. Indeed, while the interobserver reproducibility for appropriateness ratings was high, it was only moderate for choosing the clinical indication for SE ordering. These findings suggest that while physicians generally agree (80%) on an appropriateness rating once a clinical indication is defined, there remains a disconnect between physicians about why they chose to order a test for a specific patient in the first place (60%). This is a critical finding, as it suggests that the most potentially effective stage at which inappropriate testing may be reduced is at the point of order rather than at the point of service, a concept that preliminary data suggest to be effective (10).

In sum, the study by Willens et al. (6) is an important one, albeit with limitations. This study was performed on a small sample at a single academic medical center and is thus encumbered by a lack of generalizability, particularly at nonacademic settings, where the majority of imaging is performed. Further, this study only compared the AUC to 2 RBMs whose criteria were available for public consumption through the Internet, and it may be possible that RBMs with unpublished criteria for SE are in better agreement with ACC AUC. Importantly, this study also lacked any evaluation of the downstream effects of ACC AUC versus RBM criteria on clinical and/or economic outcomes. Hence, any propitious effect of ACC AUC adherence remains unknown. Overall, the study by Willens et al. (6) illustrates several beneficial aspects of ACC AUC using SE imaging as a test case, and can serve as a springboard upon which future large-scale studies can be based. By continued refinement, implementation, and education, the intent of the ACC AUC may be realized, namely, optimizing ordering patterns and judicious performance of noninvasive cardiac imaging.

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