Using a sledgehammer to crack a nut: The burdensome appropriate use criteria program

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The 2013 Multimodality Appropriate Use Criteria (AUC) for the Detection and Risk Assessment of Stable Ischemic Heart Disease define clinical scenarios where cardiac testing is unlikely to improve patients' medical care and is therefore 'rarely appropriate'.¹ Recent meta-analyses suggest that up to 1 in 5 cardiac tests performed can be designated rarely appropriate^{2,3}, similar to broader assessments suggesting that 20–30% of all advanced diagnostic imaging tests are unnecessary.⁴ In response, the United States Congress passed the Protecting Access to Medicare Act of 2014, which directed the Centers for Medicare and Medicaid Services (CMS) to establish the AUC Program. The program, set to begin in an 'education and operations testing period' on January 1, 2020, will universally require clinicians to document consultation of AUC-based clinical decision support mechanisms (CDSMs) on every Medicare claim related to advanced diagnostic imaging tests.

In the present issue of JNC, Divakaran et al describe their findings after piloting a homegrown, point-of-care CDSM to aid clinicians in cardiac test selection for inpatients. Their 12-question CDSM focused on ascertaining patient history, symptoms, primary indication for testing, pre-test probability of obstructive coronary

artery disease (CAD), and ability to exercise. In retrospective analysis of 288 inpatient cardiac tests ordered with this CDSM, Divakaran et al found that 99% were appropriate or maybe appropriate despite 30% discordance between two adjudicating physicians regarding the specific AUC indication under which the test was performed. Divakaran et al also found that information contained within the electronic health record was sufficient to assess the appropriateness of only 87% of tests and that ability to exercise was the most valuable additive information provided by the CDSM. Together, these critical pre-implementation data bolster increasing concerns among front-line providers and healthcare facilities⁵ that the AUC Program is akin to using a sledgehammer to crack a nut and that significant modifications to the program are likely needed.

THE AUC PROGRAM INDISCRIMINATELY IMPOSES FINANCIAL AND ADDITIONAL WORKLOAD BURDEN ON HEALTHCARE SYSTEMS WITHOUT ACCOUNTING FOR THE QUALITY OF CURRENT PRACTICE PATTERNS

The finding of Divakaran et al that only 1% of the inpatient cardiac tests they reviewed were rarely appropriate parallels a prior study from another large tertiary care center that only 2% of cardiac tests done to evaluate inpatients with chest pain or other anginal-equivalent symptoms were rarely appropriate.⁶ The term 'rarely appropriate' was chosen to convey the concept that an otherwise seemingly unnecessary test may actually be relevant in selected patients. While the medical community has not agreed on an acceptable rate of rarely appropriate tests, few would argue that 1–2% is

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excessive. Given this low rate of rarely appropriate inpatient cardiac testing, perhaps such tests should be excluded completely from the scope of the AUC Program. Now, it is reasonable to argue that practice patterns at large tertiary care centers may not reflect those at smaller centers where rates of rarely appropriate inpatient cardiac testing may be higher. However, even if that were true, all centers (regardless of size) should have the opportunity to demonstrate the baseline quality of their practice patterns before being forced to invest significant time and resources to develop the human and computing infrastructure needed to comply with the AUC Program. Furthermore, in an era of increasing metrics, increased provider burnout (often due to lack of power or perceived autonomy), and decreasing reimbursements, the value of adding administrative ‘hoops’ like the AUC program should be shared with healthcare providers and health systems *a priori* with pilot data and that simply has not been done.

**INHERENT SUBJECTIVITY
IN THE INTERPRETATION OF CLINICAL
SCENARIOS STRONGLY SUGGESTS
THAT THE AUC PROGRAM WILL HAVE LIMITED
IMPACT**

As the old adage says: if you want two different opinions, ask two different physicians. Divakaran et al found that two physicians adjudicating the specific AUC indication under which cardiac tests were performed were discordant 30% of the time, often due to differing assessments of patients’ pre-test probability of obstructive CAD. In their discussion, the authors astutely conclude that this is evidence of significant subjectivity in the interpretation of clinical scenarios when applying AUC. Indeed, categorical assessment of patients’ pre-test probability of having obstructive CAD as low, intermediate, or high is explicitly described in the 2012 Guideline for the Diagnosis and Management of Patients with Stable Ischemic Heart Disease as ‘somewhat arbitrary’⁷ and has only become more so amidst an ongoing ‘battle of the scores’⁸ including the updated Diamond-Forrester model⁹ and the CAD Consortium models.¹⁰ Both of these scores are heavily influenced by classification of patients’ symptoms as non-specific chest pain, atypical angina, or typical angina which is independently highly subjective and often based on missing or incomplete clinical documentation. Furthermore, there is little consensus on how patients solely with dyspnea on exertion fit into this classification. Some documents suggest this symptom should be grouped with ‘noncardiac chest pain’; however, at many institutions, dyspnea is treated as an anginal equivalent in everyday practice. In addition to the subjectivity

associated with assessment of pre-test probabilities, application of the Multimodality AUC are also dependent on clinicians’ subjective assessment of patients’ ability to exercise adequately during cardiac stress testing. Finally, and perhaps most concerning, recent data have shown that application of different AUC to a specific patient and test can result in substantial discordance in assessments of appropriateness.¹¹ Given all this subjectivity and the fact that clinicians can ‘shop’ through CDSMs (Table 1) to find appropriate indications for tests, it is unlikely that clinicians will purposefully order a test rated as rarely appropriate by a CDSM. From that perspective, the AUC Program and its associated CDSMs will immediately ‘solve’ the problem of rarely appropriate cardiac testing on paper but they won’t have any meaningful impact in improving the cardiovascular care that patients receive.

**THE AUC PROGRAM SHOULD NOT MOVE
FORWARD UNTIL ASSOCIATED CDSMS ARE
BETTER INTEGRATED INTO ELECTRONIC
HEALTH RECORDS**

Like the CDSM designed by Divakaran et al, most commercially available CDSMs approved for use under the AUC Program require clinicians to manually enter data that is already discretely stored in the electronic health record (i.e., history of CAD, presence of cardiovascular risk factors, current medications, weight) to determine the specific AUC indication under test appropriateness will be assessed. This not only burdens clinicians with unnecessary and duplicative administrative work, it is also subject to provider errors in data retrieval and entry. As Divakaran et al found in their analyses, clinicians often miss critical information during real-time assessment of patients and their records (i.e., history of coronary revascularization, prior cardiac testing, current smoking status) that can significantly alter the specific AUC indication they believe a test is being performed under. Until CDSMs can automatically pull relevant data to assist clinicians—and verify their input—policies like the AUC Program that mandate CDSM use should be optional. In the current era of machine learning, artificial intelligence, and advanced algorithmic computing, most of the key clinical variables should be able to readily discerned and pre-approved in nearly all cases. Further, it may make sense to consider spending resources on developing such technology in place of a provider-carried, burdensome ‘consult the AUC’ paradigm. For the time being, in lieu of CDSMs, it may be reasonable to use more local solutions that leverage personalized audit and feedback to reduce the prevalence of rarely appropriate cardiac testing.¹²

Table 1. Clinical decision support mechanisms qualified by CMS for use under the appropriate use criteria program as of June 2019

Qualified CDSMs

AgileMD's Clinical Decision Support Mechanism
AIM Specialty Health ProviderPortal^a
Applied Pathways CURION™ Platform
Cranberry Peak ezCDS
eviCore healthcare's Clinical Decision Support Mechanism
EvidenceCare's Imaging Advisor
Inveni-QA's Semantic Answers in Medicine
MedCurrent OrderWise
Medicalis Clinical Decision Support Mechanism
National Decision Support Company CareSelect^a
National Imaging Associates RadMD
Reliant Medical Group CDSM
Sage Health Management Solutions Inc. RadWise
Stanson Health's Stanson CDS
Test Appropriate CDSM^a

^aFree tool available

To conclude, it is clear that rarely appropriate cardiac testing occurs far more frequently than it should and should be eliminated where possible. The AUC program and its associated CDSMs, while well-intentioned, needlessly burden clinicians and healthcare systems with significant effort and costs while providing a relatively meaningless 'fix.' Local solutions that emphasize personalized feedback to ordering clinicians and are not tied to reimbursement may be better-suited to achieve the desired improvements in patients' care. Alternatively, making technology work for patients and clinicians in the ways described above could simplify and revolutionize workflows, and that's where the real 'sledgehammer' is needed.

Disclosures

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