

Appropriate Use Criteria Update

Assessing the appropriate use of PCI in your practice.

BY STEVEN P. MARSO, MD

Percutaneous coronary intervention (PCI) is a mature medical procedure with established safety, efficacy, and procedural techniques. Moreover, there is a large body of evidence to support its use and nonuse. As such, public reporting, quality assessment, and appropriateness measurements are now commonplace for interventional cardiology practices. National efforts are underway to expand these quality assessment programs to include PCI-specific performance measures. There is no doubt that these national initiatives are here to stay. Quality assessment champions and early physician adopters will not only propel our specialty forward, but will also gain a competitive advantage over time. Medical practices and physicians that align themselves with the mission of their health system and these national priorities will be the health care leaders of the future. Although there are a number of terrific quality improvement initiatives to focus on in the coming year, perhaps there is none better than to codify your individual and institutional appropriate use criteria (AUC) for PCI.

Appropriate utilization of PCI is deservedly a national health care policy priority for the United States. PCI is a high-impact clinical procedure; it relieves angina, is life saving, and reduces reinfarction in patients with acute coronary syndromes (ACS). PCI is the most commonly performed coronary revascularization procedure in the United States (approximately 600,000 each year) at a per-procedural cost of approximately \$12,000 per patient. It also accounts for a substantial portion of Medicare payments to hospitals; the only other medical procedure that accounts for greater reimbursement would be total hip and knee replacements.

Physician variability is commonplace and associated with increased cost. Variability has been documented in a number of diverse medical situations, including antibiotic use, diagnostic testing, adherence to guidelines-based

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recommendations, and coronary revascularization. Many investigators have also documented substantial variability in the performance of PCI in the United States. PCI rates range from five to 42 procedures per 1,000 Medicare beneficiaries.¹ It is often argued that this variability far exceeds that which would be expected to be associated with patient preferences, regional differences in clinical comorbidities, and the clinical setting. Rather, this magnitude of variability is thought to be more likely related to physician preference and habits. Moreover, the high use of PCI is not easily associated with improved outcomes or quality.

The coronary revascularization AUC² have broad implications for both health care providers and our patients. These AUC will be used as the basis for indications, referral patterns, treatment options, physician education, shared decision making, and reimbursement for years to come. Although the AUC are not publicly reported, there will likely continue to be an increased push for transparency within institutions regarding the appropriate utilization of these procedures.

INCORPORATING AUC INTO CLINICAL PRACTICE

With a concerted effort in understanding the AUC, planning, and leveraging existing toolkits, incorporating AUC into your clinical practice need not be time consuming or cost prohibitive. Keep it simple!

TABLE 1. COMMON CLINICAL SCENARIOS CATEGORIZED AS “RARELY APPROPRIATE”^a

Scenario	Description	Stress Test	Canadian Classification System Class	Frequency
12B	One to two native vessel disease; no involvement of the LAD artery	Low	I–II	39.6%
14A	One to two native vessel disease; no involvement of the LAD artery	Int	Asymptomatic	24.5%
12A	One to two native vessel disease; no involvement of the LAD artery	Low	Asymptomatic	18.3%

^aAll patients were on one or fewer antiangina medications.
Abbreviations: Int, intermediate; LAD, left anterior descending.

There are three essential preprocedural data elements that must be known and recorded in order to accurately assess PCI appropriateness: (1) symptom status, (2) preprocedural stress test results, and (3) concomitant medical therapy.

Symptom Status

It is widely believed that all PCI procedures performed in the setting of unstable angina or non-ST-segment elevation myocardial infarction (NSTEMI) are appropriate; however, the 2012 Coronary Revascularization Focused Update³ currently categorizes PCI in the setting of low-risk (TIMI risk score of ≤ 2) ACS patients “may be appropriate.” PCI in the setting of unstable angina or NSTEMI among patients who are at higher risk is categorized as “appropriate.” Assessing a patient’s TIMI risk score can be performed quite easily. At our center, we do this at the time of admission for ACS. In fact, our

ACS order sets are specific to a low or high TIMI risk score.

Documentation for STEMI patients is also important in order to map the AUC categories; time of symptom onset to revascularization (12 hours or less) and recurrent symptoms (congestive heart failure, chest pain, hemodynamic or electrical instability) are essential. Also, the results of the PRAMI trial notwithstanding,⁵ revascularization of the nonculprit lesion in asymptomatic STEMI patients is currently categorized as “rarely appropriate.”

Stress Testing

A majority of elective AUC scenarios require knowledge of preprocedural stress test findings. It is therefore incumbent upon centers to develop processes to document whether the results of a stress test are normal or abnormal and, if abnormal, whether the results are low, intermediate, or high risk. The AUC are silent on specific criteria for risk-stratifying stress test findings, and therefore, centers will need to invest some effort in developing a coherent strategy to classify the results accordingly. Please see the *High-Risk Nuclear Stress Test Findings* side bar.

It cannot be overemphasized that developing standard operating procedures and modifying the stress test report, if needed, are vital to ensure the accurate mapping of PCI procedures in your practice. Development of these standard operating procedures often requires the input of a cross-functional team, including interventional physicians, imaging physicians, nursing staff, IT, and chart abstractors (if submitting data to the NCDR Cath PCI Registry). Very often, high-risk preprocedural stress test results shift the AUC to “appropriate.” Given the importance that the AUC place on stress testing, developing strategies to reliably document findings should be a priority.

HIGH-RISK NUCLEAR STRESS TEST FINDINGS^a

- Resting LVEF < 35%
- High-risk treadmill score (≤ 11)
- Severe exercise LVEF < 35%
- Stress-induced large perfusion defect
- Stress-induced multiple perfusion defects
- Large, fixed perfusion defect with LV dilation or increased lung uptake
- LV dilation or increased lung uptake
- Stress-induced moderate perfusion defect with LV dilation or increased lung uptake

^aAdapted from Marso SP et al. *J Am Coll Cardiol Interv.* 2012;5:229-235.⁴
Abbreviations: LV, left ventricle; LVEF, left ventricular ejection fraction.



Figure 1. Screenshots from the SCAI QIT AUC app.

Medical Therapy and Elective PCI

There are also key data elements to collect for assessing appropriateness of elective PCI patients. It is essential to assess patients' angina symptoms (and angina equivalents), including an objective assessment of the Canadian Classification System (CCS) class (the AUC group CCS I–II together and III–IV together) prior to performing coronary angiography. Angina equivalents are often not formally recognized as such in the medical record but, if present, should be.

ASSESSING APPROPRIATENESS WITHOUT PREPROCEDURAL IMAGING

Given the data from FAME I and II,^{6,7} clinicians are now frequently using fractional flow reserve (FFR) to inform medical decision making. Recognizing this shift, the 2012 focused AUC update provides guidance on the use of FFR to determine PCI appropriateness, although it should be noted that it limits its use for AUC map-

ping to lesions with a 50% to 60% diameter stenosis. For patients with one- or two-vessel disease, lesion diameter stenosis of 50% to 60%, no noninvasive testing, and/or $\text{FFR} \leq 0.8$, PCI AUC are as follows:

- Asymptomatic = rarely appropriate
- CCS I–II = may be appropriate
- CCS III–IV = appropriate

The current status of FFR and AUC notwithstanding, the use of FFR, especially in patients without stress testing, is a key diagnostic tool that aids evidence-based medical decision making and facilitates AUC mapping. Therefore, I believe its use should increase in clinical practice.

Addressing the collection of symptom status, medication history, and stress testing results will greatly facilitate mapping of PCI cases. The capacity to reliably collect this information enables informed preprocedural decision making regarding whether the PCI case will be mapped as appropriate. Table 1 summarizes the most common

ONGOING AUC-RELATED ACTIVITIES

- Renaming of the categories
 - “Appropriate”
 - “Uncertain” to “may be appropriate”
 - “Inappropriate” to “rarely appropriate”
- Publication of the 2012 Focused Update
- Ongoing revision of the AUC document by the writing committee
- New York State Medicare to disallow payment based upon AUC
 - July 1, 2013: New York State Medicaid Fee-for-Service and Medicaid Managed Care will disallow payment for PCI for those elective PCI cases categorized as “rarely appropriate.”⁸ This policy affects both hospital and provider claims.
- CMS Prospective RAC audit program for PCI AUC
 - January 2012: CMS Recovery Audit Contractor Prepayment Review Demonstration Program. RAC auditors to prospectively review for PCI appropriateness in 11 states for 3 years.

clinical scenarios in the initial AUC report⁹ that were categorized as “rarely appropriate.”

Tools to Help

There are tools to facilitate preprocedural AUC mapping. A good example is the Society for Cardiovascular Angiography and Interventions Quality Improvement Toolkit (SCAI QIT) Cath Lab Guidelines and Appropriate Use Criteria App, which can be accessed at www.scai-qit.org. Kalon Ho, MD, the tool's architect, developed this web-based tool to be easily accessible. Once members of the cardiac catheterization lab team input facts about a patient's case, the app will indicate where a “typical” case with those same characteristics would fall on a spectrum of appropriateness for revascularization. Interventional cardiologists can then use that information to make recommendations for treatment for an individual patient's symptoms and conditions. This tool greatly simplifies accessing the 180+ AUC clinical scenarios.

The SCAI calculator app also recognizes that complete documentation is essential in today's health care environment. It provides users with key data, including the relevant AUC scenario number, the indication score, a summary of the patient's case, and a link to a printer-friendly reporting sheet that can be added to the patient's chart—all accomplished in just a couple of minutes. Selected screenshots are shown in Figure 1, and please see the *Ongoing AUC-Related Activities* side bar for further information.

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SUMMARY

The practice of medicine remains an ultimate privilege and a noble profession. It is incredibly important that physicians strike equipoise when describing the risks and benefits for all medical treatment decisions, including coronary revascularization. The available clinical data and tools of today have made it easier than ever to foster sincere and transparent discussions between the doctor and patient. ■

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