Every day, clinicians face difficult decisions on how best to manage a given patient. Important decisions include selection of the appropriate diagnostic tests, procedures, and/or treatments to improve a patient’s outcomes. Ideally, these decisions should be informed and guided by the best medical evidence. In reality, however, clinical practice tends to be highly variable. Concerned that a lack of standards for medical evidence. In reality, however, clinical practice tends to be highly variable. Concerned that a lack of standards for medical evidence. In reality, however, clinical practice tends to be highly variable. Concerned that a lack of standards for medical evidence. In reality, however, clinical practice tends to be highly variable.

To operationalize the recommendations in CPGs, specific Performance Measures documents are often generated. Performance Measures documents are developed by a separate ACC/AHA task force. Their writing committees identify the most critical recommendations from CPGs that are measurable, actionable, and strongly associated with improved patient outcomes. These are then converted to quantitative metrics for assessing the quality of patient care for a given condition. Assuming a patient meets performance-measure eligibility, failure to deliver such care is considered a quality concern. For this reason, Performance Measures are increasingly being used as the basis for public reporting and pay-for-performance programs. Quality Metrics, another derivative of CPGs, are more general translations of the CPG recommendations to metrics for self assessment and quality improvement but are less restrictive, may not meet all specifications of formal performance measures, and have not been sanctioned by the Performance Measures Task Force for public reporting.

CPGs and Performance Measures are not the only documents published by the ACC and AHA to guide clinical practice. On the pages of the flagship journals of the 2 professional cardiovascular societies, clinicians typically see an array of documents that are summarized in Table 1. Some of these are published jointly by the ACC and AHA, at times in collaboration with other medical societies. Some documents may be published independently by either the AHA or ACC or in collaboration with 1 or more other professional medical societies. Interested readers can learn more about the processes and policies for developing these documents on the Web sites of the AHA (http://www.americanheart.org/presenter.jhtml?identifier=3023366) and ACC (http://acc.org/qualityandscience/clinical/statements.htm). The AHA and ACC have well-established procedures for the flow of development of CPGs as illustrated in the 2003 review article. An example of how the AHA uses its Manuscript Oversight Committee to monitor the integration of the statement and guideline development for its portfolio of documents is shown in Figure 1.

In 2005, the ACC expanded these types of documents when it published a methodology article for appropriateness criteria (now referred to as appropriate use criteria [AUC]) for cardiovascular imaging. The development of AUC documents was prompted by concerns of third parties over the explosive growth in cardiovascular imaging procedures. However, unlike some other areas of cardiovascular care, the evidence base available to guide practice for imaging was very limited. For example, only 2.4% of the ACC/AHA CPG

**Tools for Guiding Clinical Practice From the American Heart Association and the American College of Cardiology**

What Are They and How Should Clinicians Use Them?

Elliott M. Antman, MD; Eric D. Peterson, MD, MPH

recommendations put forth by the writing group in a CPG are available, expert consensus is utilized (Figure 2). The draft from RCTs and other sources; if such evidence is not noted previously, the goal of the CPGs is to generate practice important differences are illustrated in Figure 2. First, as technologies. In fact, the situation is more complicated and societies to be responsive to external demands for "reigning unchanged and at times inappropriate use of expensive tools. Since 2005, the ACC has published AUC documents covering echocardiography, stress echocardiography, cardiac computed tomography/magnetic resonance imaging, and single photon emission computed tomography myocardial perfusion imaging.10–13

Like Performance Measures, AUC documents can be seen as a derivative of CPGs. Writing committees for AUC documents have available a summary of the recommendations from CPGs before they create specific clinical scenarios meant to illustrate how the recommendations in CPGs might be implemented. For each clinical scenario, an appropriateness score is generated by individual members of a technical panel, and a summary score for each scenario is generated. Although the ability to reach consensus among the writing experts is robust via the Delphi process, the ratings reflect the judgment only of the 12 to 15 members of the technical panel and, a new twist on the interplay between CPGs and AUC documents is seen with the publication of the 2009 Appropriateness Criteria for Coronary Revascularization.14

Some readers may discern that, on the surface, overlap exists between the CPG and AUC efforts because both, in part, originally grew out of laudable efforts by professional societies to be responsive to external demands for "reigning in" unchecked and at times inappropriate use of expensive technologies. In fact, the situation is more complicated and important differences are illustrated in Figure 2. First, as noted previously, the goal of the CPGs is to generate practice recommendations based on evidence, in order of preference, from RCTs and other sources; if such evidence is not available, expert consensus is utilized (Figure 2). The draft recommendations put forth by the writing group in a CPG are subsequently reviewed and may be modified during an extensive review process that includes dozens of peer reviewers, as well as the leadership of both organizations.

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As noted previously, AUC documents originally addressed areas where RCTs or multicenter registries were limited; they rely heavily on expert consensus (Figure 2). In this issue of *Circulation*, a new twist on the interplay between CPGs and AUC documents is seen with the publication of the 2009 Appropriateness Criteria for Coronary Revascularization.14

Unlike prior AUC documents, the current AUC document analyzed therapeutic interventions where evidence from clin-
ical trials and registries is available and prior CPGs provided specific practice recommendations (in the chronic stable angina, unstable angina/non–ST-elevation myocardial infarction, ST-elevation myocardial infarction, percutaneous coronary intervention, and coronary artery bypass grafting CPGs).5,6,7,15,16,17,18,19

During the vetting of the AUC document, concern was expressed that some in the media, third-party payers, and/or practicing clinicians might misinterpret the AUC document as “the new guidelines from the ACC and AHA.” The AUC writing group clarified, however, that the recommendations in the CPGs remain the official recommendations of the AHA and ACC and in no way are superseded by the AUC document on coronary revascularization.14 Specifically, the AUC document is “. . . developed as a supplement to the ACC/AHA guideline documents.”20

The AUC writing committee considered a broad range of potential indications including differences in presentation acuity (e.g., acute myocardial infarction versus chronic stable angina patients), symptom status (asymptomatic to severe angina), upstream management (prior use of optimal antianginal therapies), prior documentation of ischemia on noninvasive test results, and extent of coronary artery occlusions. They estimated that ≈4000 separate clinical scenarios would be needed to reflect the full range of clinical circumstances.14 For practical reasons, they ultimately summarized 180 individual clinical scenarios believed to reflect the most common situations. Because the writing committee was provided the list of recommendations from the relevant CPGs, it is gratifying but not surprising that 100% congruence was found between the Class I and III recommendations from the CPG and those rated as “appropriate” or “inappropriate” by the AUC panel. It is important to be vigilant to prevent any discrepancies from emerging between recommendations in CPGs and rankings in future AUC documents. Occasional rare discrepancies might be seen if new evidence has emerged that in the interim has not yet been addressed in the latest version of the CPG.

Additional concern was expressed that the assignment of a letter code of A (Appropriate), U (Uncertain), and I (Inappropriate) and numerical score (1 through 9) for each of the clinical scenarios with a subscripted appropriateness score might lead to confusion with the Class of Recommendation/Level of Evidence nomenclature of CPGs. This was addressed by the authors of the AUC document by adding a footnote to each of the tables indicating, “Subscripted num-
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Figure 2. Development of Clinical Practice Guidelines and derivative products such as Performance Measures and Appropriate Use Criteria documents. Writing committees for CPGs review and summarize the evidence in the medical literature, relying heavily on RCTs. When these are not available, they turn to other data sources including other forms of trials, meta-analyses, and registry data; if such evidence is not available, expert consensus is utilized. Performance Measure documents (solid diagonal arrow) are derivatives of CPGs, focusing on the most critical recommendations to provide quantitative metrics for assessing the quality of patient care for a given condition. Appropriate use criteria documents (dashed diagonal arrow) are another derivative that supplement the recommendations in CPGs by providing representative clinical scenarios for clinicians to use for benchmarking their performance. Additional sources of evidence such as comparative effectiveness and patient preferences would be most helpful in the future for improving the process of developing CPGs and key derivative products.

It was the intention that the new AUC document on coronary revascularization would allow clinicians to measure their individual practice patterns and make comparisons through benchmarking against their peers. Although that is a laudable goal, it is important to note that many challenges remain and there is room to improve the processes for both CPGs and AUC documents. First and most importantly, there is little argument that we need more and better evidence to support our CPGs and other scientific documents. The harsh reality is that much of the evidence that is reviewed to formulate recommendations for CPGs comes from RCTs that are sponsored by industry, usually for the purpose of bringing a new product to market or to gain a new indication for an existing product. Augmentation of this evidence base to include investigator-initiated research as well as comparative clinical trials of existing treatments and diagnostic procedures is in desperate need of funding. We need to reduce the number of recommendations in CPGs that are coded as Level of Evidence = C (expert consensus). Novel funding approaches will be necessary to accomplish this goal. Possibilities include capitalizing on the clinical and translational science awards (CTSA) effort of the National Institutes of Health (http://www.ctsaweb.org) to find new ways of evaluating therapies using practical and simplified trial designs, as well as partnering with insurance companies to fund innovative healthcare delivery research. The Comparative Effectiveness Research Act of 2008 that is under consideration by Congress (http://thomas.loc.gov/) and the 4 outcomes centers supported by the AHA may provide further support for the studies needed to provide the evidence on relative benefits and costs of various therapeutic options in the real world.

Second, CPGs and AUC must become living documents, continually updated to summarize best evidence in a timely and accurate manner. The CPGs have already made great strides to do this with routine evaluation of the results of recently released clinical trials. As well, the first AUC document for single photon emission computed tomography myocardial perfusion imaging has already undergone update and revision. The criteria and goals for these documents will also need ongoing evaluation. Specifically, some have called for incorporating cost comparisons and patient preferences when formulating CPG recommendations. Currently, the CPGs explicitly exclude cost and cost effectiveness. However, the writing committee members for their derivative products, Performance Measures and AUC documents, do factor in consideration of resource demands during their deliberations. Similarly, whereas CPGs do explicitly acknowledge the important role of patient preference in medical decision making (for example, cardiac catheterization after presentation with unstable angina/non–ST-elevation myocardial infarction) the ability to include patient preferences more broadly into CPG recommendations is limited, if not impossible, at present given the lack of information about such preferences (Figure 2).

Third, we need more knowledge on how best to translate evidence-based recommendations into practice to improve patient outcomes and efficiency of care. We do have evidence that patient outcomes are improved when clinicians practice in accordance with the recommendations of CPGs. The evidence supporting the impact of AUC documents is more limited. In 2001, Hemingway et al evaluated appropriateness criteria for coronary artery bypass grafting and percutaneous coronary interventions. In that report from a capitated system (3 teaching hospitals in London, UK) outcomes were worse when patients were treated medically where revascularization was considered appropriate. Even though AUCs are often thought of as tools for limiting “overuse” of tests or procedures in situations where benefits are limited or nonexistent, this study importantly indicates that AUC can also help identify “underuse” of therapies in situations where patient outcomes may be improved.

Additionally, we need to develop means for easily measuring the consistency with which providers’ practices match those suggested by the CPG or AUC and what effect such consistency has on patient outcome. As noted previously, ACC/AHA Performance Measures highlight a subset of CPG recommendations for measurement, yet over time the number of these Performance Measures has expanded and the work to collect these data threatens to overwhelm hospitals and clinicians alike. Early evidence suggests that application of AUC documents is an intensive effort that demands an existing database or detailed data collection. It is not clear
how many clinicians will undertake the effort to obtain guidance from the most recently published 180 clinical scenarios for coronary revascularization. It is likely that practitioners will feel the current reimbursement process, which is heavily oriented to compensation for procedures, causes them to remain grounded in the financial realities of clinical practice, especially in the present economic climate.

Finally, the limitations of CPGs and AUC documents must be clearly understood. Both are intended to be general guides for practice, with CPGs being the most exhaustive review of the literature. Even with 180 scenarios in the current revascularization AUC, it is likely that clinicians will encounter specific clinical scenarios that are not covered, and it would be unfair if a third-party payer denied payment because the patient in question did not fit the 180 scenarios. Furthermore, in some covered scenarios, there may be extenuating circumstances that would lead a patient and his or her provider to a different decision than that outlined by the AUC (or CPG).

The recommendations in CPGs remain the primary source of guidance for practice: They are the official policies of the ACC and AHA, are the best effort to reflect the available evidence, and are purposefully written from a broad thematic perspective to provide recommendations to individual clinicians who must ultimately exercise informed judgment about the specific patient in front of them. AUC documents are an example of a derivative product meant to help translate and implement recommendations. They provide consensus judgments as to the usefulness of a test or procedure in a defined clinical scenario. For this reason, AUCs can assist clinicians in their decision-making processes and may become useful tools for benchmarking provider practices relative to that of peers if these criteria become routinely measured in the community. AUCs, however, should not be seen as superseding or replacing the CPG recommendations, nor should they be used as the sole determinant of reimbursement decisions.

Disclosures
Dr Antman is a member of the Science Advisory Coordinating Committee of the AHA and the Board of Trustees of the ACC. He is a past chair of the ACC/AHA Task Force on Practice Guidelines, was the chair of the ACC/AHA Writing Committee for the guidelines on ST-elevation myocardial infarction (2003 to 2008), and is a member of the ACC/AHA Writing Committee for the guidelines on unstable angina/non-ST-segment myocardial infarction (2001 to present). He is a senior investigator in the TIMI Study Group, which receives research grants for clinical research both from industry and the National Institutes of Health. Dr Peterson is a member of the ACC/AHA Task Force on Clinical DATA Standards, the ACC/AHA Writing Committee for the Unstable Angina/Non-ST-Segment Elevation Myocardial Infarction Guideline Recommendations (2004 to the present), the ACC/AHA Performance Measures Task Force, and the ACC Working Group, Appropriateness Use Criteria Oversight Committee. He receives funding from the ACC National Cardiovascular Data Registry and from the AHA, for which he serves as principal investigator of the Duke Data Warehouse and Analysis Center of the Duke Clinical Research Institute.

References


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