they can begin to bridge the gap between subjective and objective estimates of survival.

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Methods | The Translating Outstanding Performance in Percutaneous Coronary Intervention study5 surveyed 500 hospitals regarding processes of PCI care and included detailed questions about institutional practices regarding review of PCI appropriateness from January 1, 2010, through December 31, 2012. Hospitals were stratified based on the frequency of their appropriateness review (no review, daily to monthly review, quarterly review, or unknown review frequency). Appropriateness of PCI was determined for all patients undergoing nonacute PCI at participating hospitals using data from the National Cardiovascular Data Registry’s CathPCI Registry and applying validated algorithms based on the 2012 AUC. Use of guideline-recommended pharmacotherapy, in-hospital mortality, and periprocedural bleeding complications were assessed. Additional analyses examined the association of procedural appropriateness with clinical outcomes and the association between nonacute PCI volume with procedural appropriateness, review frequency, and clinical outcomes were conducted.

Results | A total of 129 539 patients undergoing nonacute PCI at 387 hospitals were included in the analysis. Among these hospitals, 101 (26.1%) reported no review of PCI appropriateness, 104 (26.9%) reported daily to monthly review, 136 (35.1%) reported quarterly review, and 46 (11.9%) did not report a frequency for their review of appropriateness. No significant differences were found in PCI volume, hospital ownership status, or teaching or safety-net status across appropriateness review groups (Table). Overall, 10 722 nonacute PCIs (8.3%) were rarely appropriate, 29 768 (23.0%) were maybe appropriate, and 55 408 (42.8%) were appropriate, with 33 641 (26.0%) nonmappable. Significant hospital variation was found in the proportion of PCIs considered rarely appropriate, but this proportion did not vary significantly by the frequency of AUC review (median proportion of rarely appropriate PCIs, 7.3%-8.3%; Figure, A). Review practices were not associated with differences in the use of guideline-recommended pharmacotherapy, in-hospital mortality, or periprocedural bleeding complications (Table). Rates of in-hospital mortality and periprocedural bleeding were low and did not differ after stratifying hospitals into tertiles based upon the proportion of PCI classified as rarely appropriate. In the lowest tertile, 3.5% of procedures were considered rarely appropriate, and the corresponding in-hospital bleeding and mortality rates were 0.6% and 0.2%, respectively. In contrast, in the highest tertile, 15.8% of procedures were considered rarely appropriate, and in-hospital bleeding and mortality rates were 1.2% and 0.4%, respectively (P value for all compari-
sons > .05). When considered as a continuous variable, hospitals' proportion of rarely appropriate PCIs was weakly associated with both in-hospital mortality or periprocedural bleeding (Spearman's correlation coefficient of 0.10 and 0.15, respectively). There was a modest inverse association between hospitals' volume of non-acute PCI and the proportion of rarely appropriate PCI (Spearman's correlation coefficient of −0.09).

Compared with hospitals with lower non-acute PCI volume (≤200 cases), hospitals with higher non-acute PCI volume (>200 cases) had lower rates of rarely appropriate PCI across each review frequency (Figure, B).

**Discussion** We found marked heterogeneity in patterns of institutional review of PCI appropriateness, with almost 1 in 4 hospitals reporting no review. Moreover, we observed marked variation in the proportion of rarely appropriate PCI across in-
stitions. However, no association was found between hospital review of PCI appropriateness with procedural appropriateness, use of guideline-recommended care, or clinical outcomes.

The AUC for coronary revascularization provide patients, health care professionals, payers, and policymakers with an opportunity to critically examine clinical practice patterns and decision making about patient selection for PCI with the hope of reducing rates of rarely appropriate PCIs while improving patient outcomes. Our finding that a quarter of hospitals do not conduct reviews of AUC suggests that many hospitals have not prioritized improving their performance on AUC. Whether the continued incorporation of PCI appropriateness into public reporting and pay-for-performance programs further incentivizes institutional efforts to improve patient selection for PCI deserves further study.

The presence of regular review alone may be insufficient to improve procedural appropriateness. We observed that differences in institutional PCI appropriateness review were not associated with hospitals’ rates of rarely appropriate PCI. This finding may reflect the fact that the frequency of appropriateness review is a limited measure of the intensity of an institution’s response to the AUC and the reality that review of AUC must be coupled with other enabling structures to be effective. Our survey instrument did not systematically collect additional details of review, including the nature of appropriateness review (prospective or retrospective) or the specific format of the review process.

Consistent with prior studies, there was a modest association between procedural appropriateness and clinical outcomes and a similarly modest correlation between nonacute PCI volume and procedural appropriateness. Of note, hospitals with a higher volume of nonacute PCI had a lower proportion of rarely appropriate PCI across all review frequencies. Whether this finding is related to the presence of better communication, leadership, and oversight at higher-volume PCI centers is unclear. There is a pressing need to identify effective strategies that can be used to support institutional improvement of PCI appropriateness.

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Risk of Demyelinating Diseases in the Central Nervous System in Patients With Inflammatory Bowel Disease Treated With Tumor Necrosis Factor Inhibitors

An association between usage of tumor necrosis factor inhibitors (anti-TNF) in patients with inflammatory bowel disease (IBD) and other immune-mediated diseases and demyelinating diseases in the central nervous system has been sug-