

It Works

Determining the Value of Echocardiography Laboratory Accreditation

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From the beginning of imaging laboratory accreditation over a quarter century ago, through a recent period of explosive growth of accreditation, laboratory leaders have likely been motivated to walk the accreditation path by 2 primary drivers; first, representing the best aspects of professionalism by seeking to improve quality of care, and second, responding to real or perceived financial pressures to obtain accreditation to ensure payment for services. Because of the fact that the Center for Medicare and Medicaid Services has not required accreditation for echocardiography services, one may conclude that the fact that over 5000 laboratories are currently accredited by the Intersocietal Accreditation Commission: Echocardiography (B. Gorman, personal communication) likely does represent a response to the call for professionalism for healthcare providers of our era.¹

See Article by Thaden et al

Gaining and maintaining accreditation requires conformation to a series of standards determined by an expert panel, and standards evolve and change over time. The main goal of accrediting bodies is typically to set a performance floor for structures, processes, and outcomes and then evaluate adherence to this performance benchmark. Increasingly, the practice of continuous quality improvement is encouraged, rather than episodic efforts tied to arbitrary renewal deadlines, and the potential for periodic audits further strengthens the continuity of evaluation. While electronic submission of applications has eased some of the paperwork previously associated with this, significant documentation is still required.

Is laboratory accreditation worth the effort? We recognize that achieving and maintaining accreditation requires significant staff time and expense that could be devoted to other options to improve quality of care, particularly for larger laboratories embedded in complex healthcare systems, where multiple entities offer an almost overwhelming variety of general and cardiovascular accreditation choices and registries.² Reviewing the literature for robust, quantitative evidence supporting the value of laboratory accreditation for quality improvement has until recently been a fruitless search, which

is unsurprising when one considers the absence of strong evidence supporting any type of accreditation, including the most global forms like that obtainable from the Joint Commission.³ It is important to recognize, however, that the absence of this evidence does not disprove the hypothesis that accreditation improves quality of care.

A recent qualitative review of the health service accreditation literature by Hinchcliff et al⁴ identified several limitations common to this body of work. First, it is difficult to conduct effective blinded, randomized studies of accreditation, which makes the inference of causation difficult to ascertain at a high level of confidence. Second, the indicators chosen to represent efficacy of accreditation were sometimes of questionable validity and reliability; these indicators must be tied to relevant and important processes and outcomes. Third, there may be an unmeasured performance bias whereby institutions (or imaging laboratories) perform higher than expected because of factors other than achievement of accreditation because the most motivated of leaders who achieve accreditation may also effectively lead other parallel efforts to improve quality. Fourth, many studies used limited or incomplete data collection strategies to test the effect of accreditation on quality. Most importantly, less than half the studies included in this review included direct comparison of accredited to nonaccredited laboratories.⁴

Fortunately, leaders of accrediting bodies, having recognized the importance of testing the value of accreditation on quality of care, are now encouraging such studies, and research groups are responding to the challenge.⁵ In this issue, Thaden et al⁶ have presented evidence of a strong association between echocardiography laboratory accreditation and quality of care. The investigators evaluated the completeness of reporting and quality of imaging for >300 patients who underwent echocardiography, first at either an Intersocietal Accreditation Commission Echocardiography accredited or nonaccredited laboratory, then again in the process of evaluation for suspected moderate to severe valvular heart disease in a quaternary valve referral center. Their finding that completeness of reporting is superior in accredited laboratories suggests that the adherence to standards of reporting required by Intersocietal Accreditation Commission accreditation is associated with improvement in the quality of reporting. The quality of reports is of course not just a matter of filling in the right boxes on a report form. Beyond getting the demographics right, reporting is critically dependent on the quality of images, and the investigators did find that image quality was superior in accredited laboratories, which is an important finding. There were, therefore, clear and significant positive associations between the status of laboratory accreditation and the quality of both imaging and reporting.⁶

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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How robust are these findings? We can use the 4 domains of Hinchcliff et al⁴ to test for risks of bias and to see whether this study might break the mold of prior, potentially less influential research. Because the study was nonrandomized, it is true that we must rely on the inference of causation between accreditation and quality. Two findings strongly supportive of a potential causative relationship, however, are the authors' findings that the completeness of interrogation of aortic valve peak instantaneous velocity differed significantly between accredited and nonaccredited laboratories, while the quality of imaging needed for quantification of mitral regurgitation did not. This is important because the Intersocietal Accreditation Commission Echocardiography standards include a specific requirement relating to how aortic stenosis jets are to be evaluated, but they do not include a requirement to acquire images satisfactory for advanced quantification of mitral regurgitation, nor to report these values.⁷ Finding the difference for required elements, along with the absence of unrequired images and reporting, does support the hypothesis that accreditation leads to better adherence to imaging guidelines, but only for the subset of those that are specified in the standards. The finding that the quality of evaluation of patients with significant aortic stenosis is superior in accredited laboratory amplifies that of a prior publication, which demonstrated that one of the common reasons for decisions to delay full accreditation to nonaccredited laboratories was their lack of completeness in assessment of aortic stenosis.⁸ Accurately determining the severity of a life-threatening condition is obviously an important task for patients and practitioners. The quality indicators chosen by these investigators, therefore, seem appropriate to examine the relationship between accreditation and the quality of imaging and reporting.

Next, is there potential for performance bias in this study? Because of the difficulty in assessing and characterizing the referring laboratories' leadership structure and preexisting quality improvement initiatives, it is difficult to be certain that these effects were due entirely to the process of seeking, gaining, and maintaining accreditation. It is possible that more progressive laboratories are more likely to seek accreditation. However, the rather disappointing finding that accreditation was unassociated with quality of imaging for quantification of mitral regurgitation suggests that there may be less substantial differences between these referring laboratories, apart from accreditation status.

Finally, how rigorous were the authors' qualitative methodologies? A strength of this study is their use of image interpretation by viewers blinded both to the accreditation status of the referring laboratory and to the actual clinical reports. Using blinded interpretations allowed them to detect a relationship between inter-rater concordance for guideline-based interpretation of severity of valvular heart disease and quality of imaging, another important finding.

There are of course several limitations not unexpected to identify in a retrospective, nonrandomized study, including the small number of images and reports studied from nonaccredited laboratories, as well as the small number of patient outcomes, which were defined as changes in decision to recommend valvular surgery. Difficulties in linking quality of performance and reporting of echocardiography with patient

outcomes are a well-known limitation of this type of study.⁹ The fact that the patients studied were referred to a quaternary heart valve center meant they tended to have moderate to severe disease. One may speculate that had the investigators been able to examine images from patients who were incorrectly deemed to not have severe valvular disease, and therefore not referred for timely treatment, then misclassification of these patients might have led to adverse outcomes because of delayed recognition of the need for intervention. Here given the right data set, we might find a stronger link between imaging accreditation and clinically important patient outcomes.

The authors are, therefore, to be commended for the design of this study, and while it is not possible to prove a clear causal relationship between accreditation and quality, the strength of the relationship identified does increase the probability of finding this if a randomized study were performed. This finding should be reassuring to laboratory leaders and staff who have devoted the time and resources to gain and maintain laboratory accreditation and could help leaders of nonaccredited laboratories make the decision to pursue accreditation.

It is encouraging to see that investigators are responding to the need for this type of research because the future of accreditation likely depends on frequent testing of the value of accreditation, along with comparisons of the cost and value to other quality improvement methods, such as certified centers and outcome registries. While randomized studies may be difficult or even unethical (a randomized time-delay study for laboratories seeking accreditation, eg), it would certainly be possible to acquire and analyze images and reports from laboratories seeking accreditation before and after they achieve accreditation. Additionally, if standards are changed to require increasing sophistication of image acquisition and reporting, which increases the difficulty and time required for imaging, it will be important for accrediting bodies to test the value added by the burden imposed. As an example, having identified a common quality gap in the imaging and quantification of mitral regurgitation, the accrediting body might choose to phase in a new requirement for this. Should we choose to do so, it would be useful to study the incremental value added to imaging quality and reporting, along with the balancing measures of amount of training and work time required to achieve this. Given sufficient patient enrollment, such a study might also enable the correlation of the improved quality of imaging and reporting with the outcome of appropriate decision-making for valvular interventions.

One undeniable facet of accreditation is that the benchmark standards must evolve and change, aligned with changes in medical practice. Accrediting organizations should be held accountable for making these changes, ideally by basing them as much as possible on changes in guidelines, and testing their value with well-designed investigations, like the work of Thaden et al.⁶ If we are to propose that laboratory accreditation improves imaging quality and reporting, then we have an obligation to continue to rigorously evaluate the potential costs and benefits of both existing and proposed standards. To do otherwise would threaten the trust that exists between accrediting bodies and the accredited laboratories, and medical leaders might then rightly look more to alternative methods of quality improvement.

Disclosures

Dr Dent is the President of the Intersocietal Accreditation Commission: Echocardiography.

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