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The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement in Diagnostic Radiology

Janet L. Strife¹
Larry E. Kun
Gary J. Becker
N. Reed Dunnick
Jennifer Bosma
Robert R. Hattery

Strife JL, Kun LE, Becker GJ, Dunnick NR,
Bosma J, Hattery RR

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¹All authors: The American Board of Radiology, 5441 E Williams Blvd., Tucson, AZ 85711. Address correspondence to J. L. Strife.

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The American public expects safe, predictable, high-quality care and assumes that physicians work to remain current and competent. The American Board of Radiology (ABR) encourages each board-certified diagnostic radiologist to understand his or her professional responsibilities and to participate in continuous quality improvement and lifelong learning.

In the United States health care system, quality of care, medical error reduction, and patient safety represent continuing themes that dominate public concern [1–3]. Maintenance of Certification (MOC), the overarching program of the American Board of Medical Specialties (ABMS) and its member boards, is the response of U.S. physicians to address these concerns [4–8]. Although advances in medical science, technology, and biomedical research continue to accelerate, other barriers prevent rapid dissemination and adoption of evidence-based, recommended care [9]. A RAND Corporation study has estimated that only 50–54% of the care Americans receive is care that has been recommended on the basis of evidence-based medical literature [3]. Much of what radiologists do is not evidence based [10]. Outcomes and costs to diagnose and treat specific diseases vary widely among physicians, hospitals, health care providers, and regions of the country [10].

To address challenges in the medical system and the public's concerns, the ABMS, composed of 24 member boards representing all medical subspecialties in the United States, mandated in March 2000 that each board initiate specialty-specific MOC programs [4–8]. Diplomates are no longer granted lifetime certification but rather must demonstrate evidence of professionalism, continuing medical education and knowledge, as well as a commitment to practice improvement. The MOC program, including “Part IV: Practice Quality Improvement,” for diagnostic radiology, radiation oncology, and

radiologic physics has been developed, approved by the ABMS, and initiated in 2007.

The overriding objective of MOC is to improve the quality of health care through diplomate-initiated learning and quality improvement. There are four component parts to the MOC process: “Part I: Professional Standing,” “Part II: Lifelong Learning and Periodic Self-Assessment,” “Part III, Cognitive Expertise,” and “Part IV: Evaluation of Practice Performance” [11–15]. The ABR program for self-evaluation of practice performance is linked to a process of continuing quality improvement and is titled “Practice Quality Improvement” (PQI).

PQI Projects

The key characteristics of PQI require each physician to demonstrate commitment to practice quality improvement and competence in clinical practice. How do we measure competence when practices are diverse and roles are unique? How can we improve quality in the system in which we provide care? The ABR guidelines state that every diplomate must select a project or projects that potentially can improve the quality of the diplomate's practice and enhance quality of care. Key requirements for the ABR's PQI program are that each project (a) be relevant to the diplomate's practice, (b) be achievable in a practice setting, (c) produce measurable results that are suitable for repeated measurement over the course of the 10-year MOC cycle, and (d) be able to effect quality improvement. We anticipate that most PQI projects will include the majority or all of the six general competencies of medicine defined for training and practice: medical knowledge, patient care, interpersonal and communication skills, professionalism, practice-based learning and improvement, and systems-based practice.

A central element of PQI is to provide evidence of critical evaluation of the individual's

performance in practice. Clearly, the ultimate goals of each individual diplomate, as well as all diplomates collectively, must be to achieve ongoing improvement of practice and to demonstrate competency as a physician [6, 8, 16].

Projects may be developed by the diplomates individually, by institutions or societies, or as a part of national registries. At this juncture, because the ABR is just introducing part IV requirements, only failure to participate in a project or failure to comply with ABR's reporting requirements will be considered unsatisfactory performance. As diplomates become more familiar with quality improvement principles and their applications to radiology practice, expectations for specific outcomes in the PQI project will be developed and articulated by the ABR.

This communication addresses how diplomates participating in the ABR MOC program will use part IV (PQI) to demonstrate to patients, colleagues, and the broader health care community that they continue to maintain the competencies of medicine previously mentioned.

In developing its program of part IV topics, the ABR faced the following major challenges: the diversity of radiology practices, including the full spectrum from generalist to subspecialist, active practitioner to administrator, and direct patient caregiver to consultant; the full range of practice settings, from hospital to office based to both; the lack of a disease-specific focus in radiology; and the need to address and incorporate national health care priorities.

In an effort to meet these challenges, the ABR has created five categories from which an individual diplomate can select one required PQI project: (a) patient safety, (b) accuracy of interpretation, (c) report turnaround time, (d) practice guidelines and technical standards, and (e) referring physician surveys. The paragraphs that follow describe the rationale underlying each of these categories, concrete examples of PQI projects that might be undertaken by an individual diplomate, and suggestions as to how national or subspecialty societies could lend valuable aid to project development. A potential secondary gain is the production of national data repositories, allowing individual diplomates to compare their performance with that of their colleagues.

What is the timeline for participation? The first year of a cycle should provide radiologists the opportunity to learn about the PQI process and explore options for participating in an assessment of their practices regarding improvement in the quality of care delivered. Each di-

agnostic radiologist may select a project appropriate for an individual, participate in a project within a radiology department, or choose a qualified national project sponsored by a radiologic society. After selecting a project, the steps are (a) collect baseline data relevant to the chosen project, (b) review and analyze the data and develop an improvement plan, (c) remeasure and track, and (d) report participation to the ABR using the template provided by the ABR (Table 1). The reporting requirements are satisfied by electronic entry into each diplomate's password-protected ABR Personal Database. The descriptions below include a brief rationale and specific examples of the five areas targeted to improve quality of care in diagnostic radiology. This is a work in progress, and the examples here are provided to help the diplomate understand the process as it nears implementation. Note that the minimum requirement is satisfactory completion of one PQI project per MOC cycle. If goals in a project are achieved readily, however, the diplomate will be encouraged to select and participate in another quality improvement project.

TABLE 1: PQI Timeline and Milestone Tracking for Diagnostic Radiology Diplomates

Year of Cycle	Task ^a
1	Learn about PQI process Select project and metric(s)
2	Collect baseline data
3	Analyze the data Work on improvement plan
4	Collect data, compare with initial data, summarize results
5	Modify improvement plan
6	Analyze data If goals achieved, select additional PQI project
7	Summarize data Refine improvement plan
8	Continue collecting data
9	Complete collection of improvement plan data Analyze data Summarize data
10	Prepare final report of results and conclusions Maintain gain of first cycle Select topic for next cycle

^aTo be completed by diplomate in specified year of 10-year MOC cycle.

Patient Safety

All radiologists are concerned with the safety of the patients in their practices. Some examples of safety parameters that could be measured include radiation dose (especially in vulnerable patient groups such as pediatric patients or women of child-bearing age), magnetic resonance (MR) safety, hand washing, medication error prevention, and others. Described below, as an example, is the safe use of iodinated contrast material during interventional procedures.

An example of a PQI project important to a large sector of diagnostic radiology is the "safe use of iodinated radiographic contrast material." The hypothetical best practice would include all of the following: (a) accurate history in 100% of patients in advance of scheduled procedure; (b) current serum creatinine value in patients with a history indicating renal disease; (c) selection of alternative procedures (e.g., MR, ultrasonography, or unenhanced computed tomography [CT] whenever appropriate); (d) intravenous hydration, contrast dose adjustment, or other medical management in patients who have a high risk of contrast agent-induced nephropathy and who must nevertheless undergo the iodinated contrast-enhanced procedure; (e) corticosteroid premedication in patients at increased risk of severe idiosyncratic contrast agent reaction; (f) presence of a physician available during the procedure and of personnel trained in the management of severe idiosyncratic contrast agent reactions; (g) accessible inventoried crash cart in the vicinity, with its date of inventory; and (i) proper management of all contrast agent reactions that occur, with documentation of that management.

Individual patient encounter records should indicate whether the best practice outlined above was met. Patient identifying information, date, type of procedure, and clinical indication for the procedure should be recorded for the purpose of data retrieval. The completed data sheets on each patient in the baseline cohort should be tallied. The final baseline report should indicate the number of times best practice for safe use of iodinated contrast media was met.

After the baseline data are gathered and the performance improvement opportunities are identified, the performance improvement plan must be crafted. Once the plan is implemented, the diplomate simply follows the PQI template (Table 1).

Maintenance of Certification

Accuracy of Interpretation

Another characteristic of competent radiologists is that their interpretations have a high degree of accuracy. A PQI project in this category should be easily implemented and generate results suitable for entry into a local or national registry for comparison with other radiologists. One concrete example of such a project is double reading of selected examinations.

A double reading project can be performed in a variety of ways. A radiologist could compare his or her readings with those of other radiologists in the practice, compare the rendered diagnosis with the results of pathologic evaluation, or review a series of reference imaging studies presented as unknowns. The purpose of comparison of dictated results with those of colleagues viewing the same cases is to benchmark dictated reports and diagnostic impressions. Follow-up double reading studies should show a decrease in observed errors, missed findings, or reduced number of changes in interpretation.

A project studying accuracy of interpretation should include such metrics as the error rate, an analysis of root causes of those errors, and a plan to minimize the errors identified in the project. In addition, such a project should quantify not only the number of changes in interpretation by the second reader but also the significance of those changes. Projects in this category could be designed by individual diplomates or by professional societies.

RADPEER is one example of a project to study accuracy of interpretation. It was established by the American College of Radiology (ACR) and fulfills the standards listed above. This project allows a study of concurrence and error rate by radiologist, facility, and modality. Error severity and impact can be analyzed through the peer review committee input, as suggested by the RADPEER project. This program is part of the National Radiology Data Registry (NRDR).

Report Turnaround Time

Referring physicians act on interpretations, and they utilize the final imaging report to help them care for their patients. Thus, it is important to provide diagnostic interpretation in a timely fashion. The times that are appropriate for these radiology reports vary with the clinical setting. For example, different report times are appropriate for patients seen in the emergency room, for inpatients, for outpatients, and for those undergoing screening examinations.

The report time is defined as the time between completion of the examination and the

time when the final report is made available to the referring physician. Increasingly, examinations are electronically reported, which makes collection of such data practical.

A PQI project on report times would include collection of baseline data for the individual radiologist. A plan to improve the report times should then be prepared in written form and should describe measures to improve the performance. Then, data should be collected a second time, approximately 3 years after the first data set. A second improvement plan should then be developed on the basis of the results evident in the second data collection. This leads to a third data collection interval after another 2–3 years.

Practice Guidelines and Technical Standards

Choosing this PQI category requires that the diplomate select two projects: One must involve the ACR communication guideline; the other may be based upon any of the 91 practice guidelines and six technical standards available through ACR publications or the ACR Web site (www.acr.org).

Communication Project

Competent radiologists are capable clinicians whose contribution to patient care includes communicating the results of radiologic examinations to the appropriate individuals in a timely manner. Accordingly, the ACR practice guideline on communication states, "When a study discovers findings that reflect a diagnosis that seriously impacts the patient's health, a direct communication to the caring physician is mandatory and should also be documented in the final report."

As a concrete example, the radiologist could review a consecutive series of recent reports to determine how often unexpected results were detected and communicated to the appropriate physician at the time of the examination and how often communication was documented in the final written report. On the basis of the analysis of the initial study, an improvement plan could be developed. Subsequently, in a different year, review of another consecutive series of reports could be compared with the initial study, and improvement in performance will hopefully be noted.

Practice Guideline and Technical Standards Project

Diplomates choosing this category of PQI project must also select another project that deals with any of the other practice guidelines

or technical standards. As an example, a radiologist who performs CT of the abdomen and pelvis could review a series of consecutive cases from recent practice to determine how much (what percentage) of the small or large intestine was adequately filled with oral contrast material.

For each practice guideline, after analysis of the results a plan is formulated for improvement. Subsequently, a second data collection period helps determine the effectiveness of this plan (Table 1).

Referring Physician Surveys

Patient treatment is usually directed by the referring physician. The radiologist contributes to care of the patient by helping the referring physician request the most appropriate examination, providing timely patient access to imaging, performing the examination safely, interpreting the study accurately, and reporting the findings promptly. The experience of the referring physicians' interactions with the radiologist can be assessed through surveys of those referring physicians.

Referring physician surveys must be qualified by the ABR. A few example surveys, either developed by the ABR or modified from the CAHPS (Consumer Assessment of Healthcare Providers and Systems) survey, are available on the ABR Web site. The survey must include the following parameters: accessibility of the radiologist for examinations or procedures, responsiveness for urgent examination consultation, professionalism, report turnaround time, and satisfaction of the referring physician with his or her interaction. As with other projects, analysis of the responses must lead to an improvement plan, which, after initiation, should be evaluated by using the same survey instrument after a suitable time period.

The ABR and MOC

Dramatic change has occurred in the relationship of the diplomate to the ABR. In the past, interaction occurred only in residency for the three examinations: physics, clinical, and oral. Now, the relationship between a diagnostic radiologist and the ABR will begin in residency and be continuous throughout his or her professional life. The lifetime relationship will be maintained through frequent electronic communication of MOC updates, key milestones concerning the diplomate's progress through the MOC cycle, and reminders to increase activity whenever the diplomate is falling behind.

Transformation of the ABR Infrastructure

The ABR is committed to providing a Web-based system for diplomates to use both to access current information about maintenance of certification requirements and to record progress. The ABR Web site enables diplomates to access specialty-specific information and resources about MOC: the four components; the six competencies; and all requirements, examinations, and fees. The password-protected ABR Personal Database is each diplomate's center for personalized information about MOC requirements and for tracking and documenting MOC progress. Within his or her personal database, the individual will be able to record participation in educational activities; attest to the fulfillment of various requirements, such as participation in PQI projects; update personal information; pay fees; and register for examinations.

Future plans call for linkages between the ABR and societies sponsoring continuing medical education (CME) credit, self-assessment modules (SAMs), and PQI projects. These linkages, undertaken with permission of the society and the individual diplomate, will allow the transmission of credits and PQI participation directly into the individual's ABR Personal Database. These entries will be regarded by the ABR as authenticated in the case of an audit, and no further documentation will be required.

The Role of Subspecialty Societies

Both the broad-based and the subspecialty radiology societies play a very important role, serving their members by advancing the science and practice of their subspecialty and informing them on regional and national issues relevant to their practice. The societies know the key components of their practices and stimulate the promotion of quality in practice. Their multiple and potentially expanded roles include, but are not limited to, educational courses or SAMs concerning PQI, workshops on subtopics of PQI, identification of key PQI focus areas and potential metrics, and the development of tools or project templates for society members.

Development of national databases related to practice parameters in diagnostic radiology is an important future goal in collecting PQI data, and professional societies may play an active role in identifying key issues and providing templates for data collection. National databases of practice parameters are a valuable tool in optimizing the practice of medicine for our patients because they allow each radiologist to compare his or her results with those collected in similar practices throughout the country. The need for pooled, aggregate data on PQI results represents an opportunity for collaboration among the many radiologic societies to establish national databases for the benefit of our patients, our specialty, and all of medicine.

Summary

There is a national imperative to improve the quality and safety of health care. For radiologists, participation in the ABR's MOC PQI projects is a vehicle through which this can happen. We must measure what we do, provide comparative data, and encourage standardization of practice components to work toward improving the quality of care. Radiology has lagged behind some of the other specialties in measuring what we do and documenting our impact on clinical care. The ABR PQI program is a work in progress. Considerable progress has been made in understanding our charge and identifying ways to use common practice metrics to enhance the individual's practice of radiology, yet, change should be anticipated. As our evidence base grows, our PQI efforts will be improved and refined. We encourage active participation of all certified radiologists, both those with time-limited certificates and those with lifetime certificates. We believe that most radiologists want to engage in a personally and professionally rewarding, publicly visible process for ongoing quality improvement.

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