The Journal of Continuing Education in the Health Professions

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Evolving Health Care Systems and Approaches to Maintenance of Certification

R. Van Harrison, PhD; Curtis A. Olson, PhD

This supplemental issue to the Journal of Continuing Education in the Health Professions (JCEHP) on maintenance of certification (MOC)* is sponsored by the American Board of Medical Specialties (ABMS). It provides a highly useful overview of the programmatic efforts of ABMS in the United States, the Royal College of Physicians and Surgeons of Canada (RCPSC), and the General Medical Council (GMC) of the United Kingdom to maintain and document over time the competence of physicians.

Unlike most issues of JCEHP, the primary focus of this issue is on regulatory policies and practices adopted at the national level. Two points of intersection of MOC with continuing education are (1) the development and validation of approaches to assessing physician knowledge and competence, and (2) facilitating practice-based learning. Perhaps the most fundamental convergence is the shared goal of improving patient safety, enhancing health care quality, and reducing costs.

Researchers, practitioners, and policymakers in continuing education in the health professions need to be aware of the history, current status, and future directions for MOC in these three countries. MOC is the subject of an increasing number of research studies, creating a unique opportunity to learn from the work addressing MOC. In addition, whether in the United States, Canada, or the United Kingdom, MOC has a significant educational component creating both the opportunity and the need for better integration between continuing medical education (CME) and MOC.

In this editorial, we provide an overview of the contents of this supplemental issue, highlight key concepts and issues, and locate these efforts in a larger social and organizational context. To accomplish these goals, we have organized the remainder of this essay into 5 sections:

1. Forces changing health care, health care systems, and MOC
2. Studying national programs for MOC
3. Controversies regarding national programs for MOC
4. Duality of interests associated with national programs for MOC
5. Planning research to guide evolution of MOC

Forces Changing Health Care, Health Care Systems, and MOC

The forces driving change in health care and health care systems are noted in most of the articles in this issue and will be familiar to JCEHP’s readers:

- The increasing rate of development of new methods of diagnosis and treatment with parallel increases in the complexity of health care delivery and systems that deliver care
- Concerns that appropriate care be provided and provided efficiently, that unneeded care not be provided, and that avoidable harm be prevented
- Increasing costs of care and unsustainability of current trends in rising costs
- Increasing scrutiny of how funds are used, appropriateness of use, and accountability for use
- Increasingly sophisticated information technology providing new options to facilitate the delivery of care, care management, and accountability for care

*Although these programs are referred to as maintenance of certification (MOC) in the US and Canada, and as revalidation in the UK, we will use the term MOC to refer generally to both maintenance of certification and revalidation, unless otherwise noted.

Correction added on January 9, 2014, after first online publication: the acronym for the American Board of Medical Specialties, ABMS, has been corrected on pp. S2 and S3.

Disclosures: The authors report none.

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• Ongoing debates concerning desirable benefits, affordable costs, and appropriate evolutionary choices

The joint evolution of these factors has posed ongoing and fundamental challenges to the health care industry. Just one example, is the shifting emphasis for financial payments to physicians in the United States: from fee-for-service that rewarded doing more (before mid-1990s), to fixed/capitated payments that rewarded doing less (mid-1990s to mid-2000s), to pay-for-performance and “value-based” payments that reward providing appropriate care (beginning mid-2000s).

Unsurprisingly, certification programs have not been immune to these forces. MOC is an organized and concerted response to demands for increased quality, value, and accountability in health care. Certification, recertification, and validation are at the core of national strategies for assuring the public that their physicians are competent, regularly update their knowledge and skills to stay current with scientific advances and evolving health care options, and are held accountable. However, these assurances come at a cost; they require a larger investment of time and other resources and contribute to overall increases in costs within the health care system. In addition, increasing societal pressures pose potential conflicts for physicians as they attempt to meet their commitments to professional competence, a just distribution of finite resources, and maintaining trust by managing conflicts of interest.1 As might be expected, one result is debate about whether the costs are justified given the benefits and the lost opportunities to improve care by other means. As this supplemental issue shows, these debates are likely to continue for the foreseeable future.

Several of the articles report studies of factors affecting individual and group learning and performance change and groups demonstrate types of interventions likely to be useful in designing national programs for MOC. Sargeant et al5 provide a review of evidence for principles of effective assessment and feedback. Hawkins et al6 review evidence at the individual and group levels that is generally consistent with the American Board of Medical Specialties (ABMS) MOC program in the United States. Campbell and Parboosingh3 discuss principles and the evidence at the individual level that are the basis for the current MOC program of the RCPSC.

Although studies at the individual level provide important guidance, they are essentially hypothesis generating for the design of national-level programs and policies for MOC. The effects of national MOC programs may or may not result in desired effects. Sargeant et al,2 for example, point out that the process of accessing and using performance data is complex and influenced by many factors.

Sequence of Questions Studied Regarding MOC

The types of evidence generated on initiatives such as MOC tend to address a sequence of questions regarding a hypothesized cause and effect:

• Feasibility: Can the desired intervention be performed practically?
• Effectiveness: Does the intervention produce the desired outcome (statistical significance for reliability of effect)?
• Meaningfulness: Is the size of the effect practically meaningful in its context?
• Cost: What resources are required to produce the change and at what cost?
• Cost-effectiveness: Does the value of the outcome outweigh the costs of the intervention? Are alternative approaches available for lower cost or that are more effective for the same cost?

In addition, the unit of analysis frequently progresses from individuals to groups/organizations to national levels. When we used this sequence of questions to examine the contents of this issue, we found the following:

• Feasibility: At the level of MOC programs, a few studies have demonstrated their feasibility, including the three described in this issue.2–46 At the individual and group levels, a variety of interventions have been demonstrated to be feasible.3,5,6
• Effectiveness: Little systematic evidence is available concerning the effects of current national MOC programs, although some indirect evidence is available from studies of associations with board certification, ABMS MOC exam scores,2 and the earlier voluntary system of the RCPSC.3 At the individual and group levels, a large number of studies demonstrate the effects of interventions.3,5,6
• Meaningfulness: We were unable to find mention of studies examining the effect size and meaningfulness of MOC programs2;
however, Lipner et al conclude that studies of impact of board certification show that certification “can have modest effect sizes and are not unequivocal.” At the individual and group levels, effect size is often not addressed or is small, although some moderate effects have been demonstrated in specific circumstances.

- **Cost**: None of the studies of MOC programs address the issue of direct and indirect costs of the program. One direct cost is known: the fees physicians pay to participate in 10 years of ABMS’s MOC program range from $1250 for the American Board of Surgery to $4820 for the American Board of Plastic Surgery.
- **Cost-effectiveness**: None of the articles in this issue mention studies that address the issues of cost-effectiveness at any level.

### MOC Program Differences Between Countries and Over Time

The 3 national MOC programs described in this issue differ in many ways. Some important differences include:

- **Participation**: Voluntary in the United States and Canada, required in the United Kingdom.
- **Content**: Differences in content and activities required participation in performance improvement and ongoing examinations in the United States, a focus on learning activities in Canada, and individual portfolios of supporting information for the revalidation process the United Kingdom.
- **Consequences**: In the United States, not being certified can limit some opportunities for employment. In Canada, not participating in MOC results in no longer being a member of the Royal College of Physicians and Surgeons and in some provinces, failing to meet relicensure requirements. In the United Kingdom, not participating in the “revalidation” process will result in not being able to practice.

Other important differences include:

- The ABMS MOC program provides a general framework that is operationalized differently by each of 24 independent specialty boards, resulting in qualitative and quantitative differences in requirements across specialties.
- The RCPSC includes all specialties except family physicians, for whom the College of Family Physicians of Canada operates the separate Mainpro MOC program.
- The GMC revalidation program involves appraisals of portfolios, which will vary by specialty.

The 3 MOC programs are evolving in the context of related changes in their national health care systems:

- The ABMS MOC program’s emphasis on performance measurement and improvement is consistent with the evolution of several other US national initiatives, the Physician Quality Reporting System of the Centers for Medicare and Medicaid and the competencies shared with the Accreditation Council for Continuing Medical Education.
- The RCPSC MOC program’s evolution is linked to the relicensure requirement for physician revalidation, developed by the Federation of Medical Regulatory Authorities of Canada.
- The development of the GME revalidation program in the United Kingdom was shaped by high-profile medical scandals and has a particular focus on identifying doctors in difficulty and supporting their remediation.

All 3 programs are evolving and an evaluation of a program at a current point in time may have limited generalizability to the program in the future:

- The ABMS MOC program was formally approved in 2000, revised in 2009 with more frequent requirements, and is scheduled for further revisions in 2015.
- The RCPSC MOC program has evolved from a voluntary program in 1994 to a mandatory program in 2001 and is scheduled for a major transformation in 2015.
- The GMC “revalidation” program was established at the end of 2012 and an evaluative framework is to be implemented in 2014.

### Controversies Regarding National Programs for MOC

The extent of controversy regarding MOC programs depends on the question being asked:

- No controversy exists regarding the need for physicians to maintain ongoing competence.
- Some controversy exists concerning the need for physicians to demonstrate their ongoing competence through formal MOC programs. For example, an RCPSC survey of its members found that most but not all (70%) agreed with a MOC program being a regular requirement to maintain their specialty certificate.
- Much controversy exists around how to develop and demonstrate competence. For example, the ABMS requirement for passing an examination at least every 10 years is of sufficient concern that the House of Delegates of the American Medical Association in June 2013 passed a resolution to determine if mandatory ongoing reexaminations are needed and to explore alternatives to the exams. The debates leading to GMC’s revalidation program were divisive on questions of policy, professional governance, and leadership.
- Major controversy exists regarding the costs and cost-effectiveness of MOC programs. All of the programs require physicians to document their activities and performance for external review. In the United States and Canada, physicians pay fees to support the costs of operating the MOC program. The American Medical Association has focused on the burden that MOC places on physicians. Burden on physicians was part of the controversy delaying the development the GMC program. The absence of data on either the meaningful effectiveness of MOC programs or costs associated with MOC programs results in judgments based on personal views.
If MOC programs reduce burdens on physicians, the changes are likely to be less controversial. If they increase burdens on physicians without clear demonstration of benefit, or if the consequences of losing board certification become more substantial, controversies are likely to increase appreciably.

Duality of Interests Associated with National Programs for MOC

The groups and individuals involved with MOC programs inherently have multiple and sometimes conflicting interests. We want to highlight 2 important conflicts faced by organizations operating MOC programs.

One conflict is balancing pressures from individual physicians and from national governments. Physicians are reasonably reluctant to take on burdens of uncertain benefit, limiting their acceptance of MOC requirements. However, if a national government views an MOC program as inadequate, it could bypass (or in the United Kingdom, require if a national government views an MOC program as inad-

Another conflict is balancing advocacy and transparency. As advocates for change, organizations operating MOC programs tend to emphasize the positive aspects of changes and deemphasize the negative aspects. Advocacy for taking actions that are as yet unsupported by robust evidence may involve emphasizing the likely magnitude of change over the probability of change (the modest effect size demonstrated). There is incentive to downplay issues of cost until effective-

Planning Research to Guide the Evolution of MOC

All 3 MOC programs have ongoing plans for program evaluation and research, which are noted at a general level in this issue. The sequence of questions studied noted above may provide a helpful framework in planning the research agenda and monitoring progress on its accomplishment.

An important limiting factor is the availability of resources to carry out program evaluation and research. What entity is sufficiently interested in knowing the effectiveness and cost-effectiveness of MOC programs to fund the required studies? Are governments willing to reallocate limited resources from competing needs? Are physicians willing to put additional personal resources into funding and participating in an evaluation component of an MOC program? Neither source appears likely to provide substantial funding for ongoing research initiatives.

If only limited resources will be available, MOC programs will continue to evolve without the benefit of an extensive evidence base beyond questions of feasibility and acceptability. Therefore, MOC programs will need to develop strategic priorities for research. The success of the programs will likely depend on identifying questions that are most important to the MOC program itself, to government overseers, and to and participating physicians. Limited resources should be used to collect information that addresses key questions regarding the program and assures the continued support of key stakeholders.

In conclusion, we want to thank the many authors who contributed to this special issue and the much larger group of individuals whose work is cited. We have learned a great deal from reading the contents of this issue and hope that you, the reader, will also find value in the pages that follow. The past and future efforts of these authors and many others will be needed to develop intellectual innovations, scientific evidence, and cost-effective programs that will ensure that physicians are and continue be well prepared to fulfill their role in their health care systems and to demonstrate their ongoing worthiness of public trust.

References

Professions, including those professions served by this journal, have certain characteristics in common.¹ Members of a profession have special knowledge and skills that other members of the community at large do not have, and they are called upon to use that knowledge and skills in situations of uncertainty. The community has often made substantial investments to assist the individual professional to develop this expertise; government support of health professions education and patients allowing student involvement in their care are two examples. Members of the profession commit to use their special knowledge and skills to serve the best interest of the patients, families, and communities for whom they care. This commitment is a key element in most health professions’ curricula, and the public professing of this commitment is an important element of transitional events including white coat ceremonies and graduation. Members of a profession, through the development of oversight bodies, take responsibility for the quality of practice and education in the unique knowledge and skills of the profession. This responsibility and privilege of oversight is granted by the public, which recognizes its limited abilities in the disciplinary content and is confident that the profession will act in the public’s best interest.

Among the obligations that health professionals (and, for the purposes of this supplement to the Journal of Continuing Education for the Health Professions, physicians in particular) assume, and on which the public relies, is demonstrating knowledge, skill, and professionalism over the course of one’s career. The rapid pace of change in scientific and medical knowledge and the ongoing development of procedures and technologies are well recognized, making continuous learning and improvement a professional necessity and a patient safety issue. Further, the public demands that ongoing learning and assessment be rigorous and transparent if the professions are to continue to have the privilege of self-regulation. Participation in the American Board of Medical Specialties (ABMS) Maintenance of Certification (MOC) program is one important way that over 450,000 ABMS board-certified physicians across the primary care and focused specialties participate in and demonstrate ongoing learning, self-assessment, and assessment by others.

Available to the physicians who have achieved board certification by one of the 24 ABMS member specialty boards, the ABMS MOC program is relatively young. While several ABMS member boards have had time-limited board certification since the 1970s, it was in 2000 that all of the 24 ABMS member boards committed to a rigorous 4-part program for maintaining certification. The MOC program is based on the 6 ABMS/Accreditation Council for Graduate Medical Education core competencies and incorporates requirements for professional standing and professionalism, engagement in learning, assessment of knowledge, and ongoing improvement in practice.
ABMS is pleased to sponsor this supplement to the Fall 2013 issue of *JCEHP*. This supplement explores issues inherent in career-long learning and assessment of physicians. Several articles focus on the ABMS MOC program. These articles explain the ABMS MOC process, underscore the philosophy and evidence-based nature of ABMS MOC requirements, and highlight the principles of adult learning embedded within ABMS MOC. Opportunities for improvement in the ABMS MOC program are also identified, and these findings have value for the continuous quality improvement approach to maintenance of certification that ABMS employs and to the current development of its MOC 2015 Standards. Several authors highlight how Canada and the United Kingdom are incorporating career-long learning and assessment programs into their systems of professional regulation, demonstrating that the emphasis on ongoing professional development is not exclusive to the United States.

The scholarly works presented in this supplement will contribute to the ongoing evaluation and continuous improvement of the ABMS MOC Program. For example, the current standards for the program have been reviewed over the past 18 months with plans to implement program improvements in 2015. As importantly, this supplement will contribute to the ongoing dialogue about adult learning, assessment, and professional obligations of the entire community of health professions.

**Reference**

American Board of Medical Specialties Maintenance of Certification: Theory and Evidence Regarding the Current Framework

RICHARD E. HAWKINS, MD; REBECCA S. LIPNER, PhD; HAZEN P. HAM, PhD; ROBIN WAGNER, RN, MHSA; ERIC S. HOLMBOE, MD

The American Board of Medical Specialties Maintenance of Certification Program (ABMS MOC) is designed to provide a comprehensive approach to physician lifelong learning, self-assessment, and quality improvement (QI) through its 4-part framework and coverage of the 6 competencies previously adopted by the ABMS and the Accreditation Council for Graduate Medical Education (ACGME). In this article, the theoretical rationale and exemplary empiric data regarding the MOC program and its individual parts are reviewed. The value of each part is considered in relation to 4 criteria about the relationship of the competencies addressed within that part to (1) patient outcomes, (2) physician performance, (3) validity of the assessment or educational methods utilized, and (4) learning or improvement potential. Overall, a sound theoretical rationale and a respectable evidence base exists to support the current structure and elements of the MOC program. However, it is incumbent on the ABMS and ABMS member boards to continue to examine their programs moving forward to assure the public and the profession that they are meeting expectations, are clinically relevant, and provide value to patients and participating physicians, and to refine and improve them as ongoing research indicates.

Key Words: maintenance of certification, program planning/curriculum development, profession-physicians

Introduction

In 2000, the American Board of Medical Specialties (ABMS) and its member boards formally adopted Maintenance of Certification (ABMS MOC) as a means of assuring physician engagement in self-assessment, lifelong learning and continued performance improvement. ABMS MOC represented a significant change in physician professional self-regulation, acknowledging that periodic assessment is necessary to assure the public that physicians are maintaining their clinical competence and providing high-quality care throughout their practice career. ABMS MOC is designed to provide a comprehensive approach to physician lifelong learning, self-assessment, and quality improvement (QI) through its 4-part framework and coverage of the 6 competencies previously adopted by the ABMS and the Accreditation Council for Graduate Medical Education (ACGME).1

Although feedback from various stakeholders has encouraged continued enhancement and increased rigor with regard to MOC standards, the ABMS and its member boards also receive criticism regarding the perceived financial and time burden of MOC requirements, unnecessary redundancy with other professional and regulatory requirements, and lack of relevance to physicians’ clinical practices. Such criticism is
often delivered in association with questions, or skepticism, regarding the evidence base supporting MOC.\textsuperscript{2–4}

The primary purpose of this article is to explore the theoretical underpinnings of MOC, exemplified and supported by research evidence relevant to the individual elements of MOC as outlined below. Development of the evidence base in support of MOC is conceptually similar to validation of an assessment method, and involves 2 related, sequential processes.\textsuperscript{5} First, a sound theoretical rationale supported by empiric data should define the need for development of the MOC program and substantiate its initial structure—evidence should determine that such a program is necessary and its initial components are sensible based on theory and evidence. Second, once the program is implemented, it is incumbent on its developers to gather evidence to determine whether the program is performing as it should, and to inform its continued improvement.

**Evidence of the Need for MOC**

Several sources of evidence suggest the need for a program, such as MOC, to support physician lifelong learning and health care quality improvement. Although delivery system problems are unquestionably important in affecting health care quality and safety, physician competence and performance deficits are also critical factors in medical errors and poor-quality health care.\textsuperscript{6} It has been estimated that 6\%–12\% of physicians fail to maintain professional standards of practice at any given time.\textsuperscript{7} Physician peers, as well as medical educators and regulators, point out numerous competency areas that are in need of improvement among their physician colleagues.\textsuperscript{8} Evidence stemming from a large study encompassing 12 metropolitan areas demonstrates that patients in the United States receive about 50\% of the care that is indicated for their acute and chronic medical conditions.\textsuperscript{9} More recent work suggests slow and inconsistent improvement in health care quality in the past decade.\textsuperscript{10} A systematic review of 62 studies showed that, on average, physician knowledge, skills, compliance with evidence-based process of care, and patient outcomes, tend to decline as a function of time from initial training.\textsuperscript{11} Additionally, the incidence of adverse licensure actions increases as a function of time in practice.\textsuperscript{12,13}

The above research supports the potential value of an assessment process to support physician lifelong learning and health care quality improvement. All physicians would benefit from such a process, especially as they get further from initial training. Although much of the research cited summarizes mean findings relative to the different performance elements measured, it is likely there is a spectrum of higher and lower levels of physician performance contained within the studies. In the absence of objective data, it is not possible to provide feedback to physicians regarding their position within that spectrum. Furthermore, given that physicians across the continuum of education and practice are unable to accurately identify their strengths and weaknesses within a range of competencies relevant to patient outcomes, all physicians—regardless of where they fall on the spectrum of competence—can benefit from meaningful assessment processes.\textsuperscript{14,15}

**Theoretical and Empirical Foundations: MOC Parts I–IV**

Having demonstrated the potential value of a program such as MOC, the next step is to determine whether the elements of the MOC program are sensible with regard to their focus on physician competence and performance domains that impact quality of care and patient outcomes. In this regard, the discussion is organized around the 4 parts of MOC and the individual assessment and educational approaches contained therein. TABLE 1 summarizes the 4 parts of MOC, including the required and development standards adopted in 2009 by the ABMS board of directors. Developmental standards are not immediately required for implementation; the ABMS and member boards are expected to study the reliability and validity of practice context-relevant instruments for up to a 5-year period before making a decision. The far right column lists the primary competencies that would be covered by the methods listed within each Part of MOC (including those methods considered developmental standards). For MOC Parts I, III, and IV, the primary assessment components of MOC, the discussion addresses the following fundamental questions, which may be viewed as criteria to help determine whether a particular assessment method is appropriately included in the initial MOC framework:

1. Are the domains targeted by the assessment method identified as important by the medical profession and associated with quality of care and/or health outcomes?
2. Does research demonstrate that physicians underperform in the domains targeted by the assessment methods?
3. Does research support the validity of the proposed methods in assessing the target domain?
4. Do physicians find the feedback from the particular assessment to be credible and/or is there evidence that physicians learn or improve their practice performance based on feedback from the assessment?

Part II includes the primary learning component of the MOC program (although many of the boards’ Part II components include self-assessment as part of the learning activity): the discussion summarizes existing literature regarding the value of continuing medical education (CME) that incorporates evidence-based assessment and learning formats. At the end of each section of the discussion, a summary paragraph will comment on the strength of the theoretical rationale...
### TABLE 1. Maintenance of Certification Standards

<table>
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<tr>
<th>Part</th>
<th>Title</th>
<th>Required</th>
<th>Developmental</th>
<th>ABMS/ACGME Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Licensure and Professional Standing</td>
<td>Maintain a valid, unrestricted medical license</td>
<td>Communication Core CAHPS Patient Survey (or equivalent survey that addresses communication) at least every 5 years</td>
<td>Interpersonal and Communication Skills Professionalism Patient Care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An approved Peer Survey at least every 5 years</td>
<td></td>
<td>Professionalism Patient Care Systems-Based Practice</td>
</tr>
<tr>
<td>II</td>
<td>Lifelong Learning and Self-Assessment</td>
<td>At least an average of 25 CME credits per year (averaged over 2–5 years)</td>
<td>A patient safety self-assessment program early in the MOC cycle and a minimum of once per MOC cycle</td>
<td>Individual educational activities may target any or all of the 6 competencies</td>
</tr>
<tr>
<td>III</td>
<td>Cognitive Expertise</td>
<td>A secure examination to assess cognitive skills at periodic intervals^d</td>
<td></td>
<td>Medical knowledge</td>
</tr>
<tr>
<td>IV</td>
<td>Practice Performance Assessment</td>
<td>Participation in practice assessment and quality improvement every 2–5 years</td>
<td></td>
<td>Patient Care Practice-Based Learning and Improvement Systems-Based Practice</td>
</tr>
</tbody>
</table>

^aBased on standards approved by the ABMS Board of Directors March 2009 (www.abms.org/.../Standards_for_ABMS_MOC_Approved_3_16_09.pdf).  
^bDevelopmental Standard: Not immediately required; to be piloted, tested for feasibility, and reevaluated in no more than 5 years.  
^cPrimary competency covered by each part and method (although individual methods may assess other competencies to a variable extent).  
^dRequirement for diplomate participation in secure examination unchanged from previous standards.  
ABMS = American Board of Medical Specialties; ACGME = Accreditation Council for Graduate Medical Education; CAHPS = Consumer Assessment of Healthcare Providers and Systems; CME = Continuing Medical Education; MOC = Maintenance of Certification.

and evidence for the method(s) discussed and suggest implementation strategies and directions for future research as appropriate.

**MOC Part I**

**Patient Surveys.** Patient ratings of physician communication and patient-reported experiences of health care provide a means to assess and provide feedback to physicians on the quality of health care services provided. Inclusion of such assessments within ABMS MOC is supported by research on patient–physician interactions that underscores the relationship between communication skills and patient outcomes. Relevant skills include participatory decision making, clear communication of information, and responsiveness to patient questions and concerns. Research demonstrates that physician communication skills affect patient satisfaction, perceived functional status and quality of life, adherence to treatment, engagement in self-management, utilization of health care resources, and measurable outcomes such as glucose control and blood pressure.16–23 Most (76%) medical diagnoses are ascertained during the patient interview—thus underscoring the importance of the data gathering elements of physician communication.24 In addition to affecting patient outcomes, physician communication skills are also linked with important physician-related outcomes such as the likelihood of malpractice litigation and adverse actions by state licensing boards.8,25,26

Research studies document physician underperformance with regard to communication skills. For example, physicians often interrupt their patients during the medical interview, thereby affecting the patient’s ability to ask questions and adequately express his or her concerns.27,28 When engaging patients in informed decision making, both primary care physicians and surgeons often omit key elements necessary for patient understanding.29 Research also shows
that physicians often miss clues regarding the patient’s emotional concerns. In one study, physicians missed 70% of the opportunities for empathic responses during patient interviews.

The availability of valid assessments of interpersonal and communication skills is important given concerns regarding the inaccuracy of physician self-assessment. Research exists on several tools designed to assess physician interpersonal and communication skills and patient experience of care, including the American Board of Internal Medicine (ABIM) Patient (and Peer) Assessment Module (replaced by condition-specific surveys within ABIM Practice Improvement Modules, discussed below); the Physician Assessment and Review System (PARS) of the College of Physician and Surgeons of Alberta, Canada, which integrates patient feedback into a multisource feedback instrument; and the various Consumer Assessment of Healthcare Providers and Systems (CAHPS) tools. ABIM offered the Patient and Peer Assessment Module as an elective self-evaluation component with their recertification program. Research on its use demonstrates sufficient reliability (generalizability coefficient = 0.67) as an improvement-focused tool. Although the results are modestly impacted by patient health, physician gender, and duration of care, physicians find the feedback to be helpful. In one study, 42% of the physicians indicated intent to change their communication behaviors, including intent to provide more complete and understandable explanations and discuss options more fully with patients. Similarly, physicians in multiple specialties find the patient feedback component of the PARS instrument to be credible and helpful in identifying opportunities to improve their communication skills.

When examining the impact of various assessments, research on improving physician interpersonal and communication skills yields mixed results. Three systematic reviews suggest that interventions focused on training or feedback can result in improved communication skills and patient-centered communication behaviors. However, it is likely that longer, more intensive interventions are more effective in improving communication skills. When it comes to specific communication behaviors, evidence is inconclusive—particularly with regard to interventions aimed at shared decision making or improved communication with cancer patients. Yet other interventions have been successful in improving physicians’ abilities to manage and reduce patient stress, provide information in primary care settings, and express empathy.

In summary, given that medicine is a service profession and the patient–physician relationship fundamental to health care quality, assessment of physician communication and interpersonal skills, and the perceived quality of services rendered seems essential to inform learning and improvement efforts. It is nearly impossible to achieve the national goal of patient-centered care without asking the patient about his or her experience with physicians and the health care system. Research linking communication skills to patient and physician outcomes and the documented underperformance in this domain by physicians further supports inclusion of patient surveys. In addition to substantiating the validity of patient surveys included in MOC, further implementation research should focus on defining the optimal approaches to feedback and improving communication skills.

Peer Surveys. Peer surveys play a potential role in the continuing professional development of physicians related to their ability to assess, and thus target for improvement, unique domains that are not typically captured by traditional methods that focus on medical knowledge and patient care. Domains that may be assessed by peers (defined broadly as including medical colleagues and other health care professionals such as nurses, pharmacists, physician assistants and health care administrators) include interprofessional communication, teamwork, health care coordination, and professionalism, and are important to health care quality, safety, and efficiency.

Interprofessional communication is important to patient safety and deficiencies may contribute to patient safety events. Professionalism and professional behavior are core elements of physician competence, yet research demonstrates that physicians may deviate in their everyday practice from accepted norms of professionalism. In fact, breaches in professional behavior are among the most common reasons for licensure action against physicians.

A number of papers have described the value of peer assessment, either alone or as part of multisource feedback (MSF) programs, in addressing a range of competencies in support of licensure and professional certification programs. This research demonstrates that methods of gathering input about physician competence and performance from their medical colleagues and nonphysician coworkers are feasible and provide reliable and valid information to inform physician improvement and continuing professional development.

Published studies focusing on physicians in multiple specialties (including anesthesiology, emergency medicine, family medicine, internal medicine, psychiatry, and surgery) have shown an appropriate number of assessments from peers is attainable. The manner in which raters are selected does not significantly impact ratings, although rater familiarity may have a small positive or negative effect on ratings. Research demonstrates that 8–12 ratings, depending on the number of items on the scale, from colleagues or coworkers are required to achieve high internal consistency (Cronbach alpha results >0.90) and generalizability coefficients that are appropriate for higher stakes assessments.
Factor analyses suggest that peer ratings as part of MSF programs address domains that are important to regulatory authorities and that coworkers and colleagues address different domains relevant to their expected observations of physician behaviors. For example, nonphysician coworker ratings in general are most strongly influenced by collegiality, humanistic and psychosocial skills, professionalism, and collaboration and communication factors, whereas physician ratings are more likely to be grouped into domains such as patient management, clinical assessment and performance, record keeping, self-management, and continuing professional development, but also include communication and professionalism.\textsuperscript{34,35,50,52,54,55} These domains appear to hold together over successive administration of peer ratings.\textsuperscript{57} Several studies have demonstrated that peers and coworkers avoid providing ratings in areas that they don’t observe (such as professional development or relationships with patients),\textsuperscript{50,52,54,56} and physicians may occasionally question the ability of their colleagues to rate them in selected domains.\textsuperscript{59,60} Across multiple studies, ratings of physicians by colleagues and coworkers are skewed toward the higher end of the scale, consistent with the outcomes from many global rating processes of physicians and physicians-in-training.\textsuperscript{35,50,52,54,55} Although variability in ratings does distinguish levels of performance in a manner that supports identification of improvement opportunities.\textsuperscript{33,36}

In general, physicians support the use of peers in rating their clinical skills,\textsuperscript{51,61} and find feedback from colleagues and coworkers to be useful, indicating intent to implement changes in their practice to improve.\textsuperscript{33–35,59,62} One study found that physicians with lower mean ratings were more likely to contemplate or implement changes in their practices.\textsuperscript{59} Other studies have found that unexpected, low ratings may provoke a negative reaction from physicians that impedes change.\textsuperscript{52,60} Previous work suggests surprise may occur because the ability required to perform well in a particular domain is also required to recognize good performance in that domain, and insights into prior poor performance may occur only with improved performance.\textsuperscript{63,64} Physician responses to feedback, including the likelihood of change, are influenced by a number of variables including perceptions regarding whether their raters had actually observed and were able to accurately rate their performance in selected domains.\textsuperscript{60} In addition, environmental factors (workload, institutional support, and culture), the extent to which the assessment context supports reflection and provides guidance, and individual factors such as motivation and self-efficacy influence physician responses to feedback. These factors interact in a manner that allows good feedback facilitation to overcome environmental impediments to change.\textsuperscript{55} Little published data are available to determine whether changes implemented from peer feedback lead to measurable performance improvement; however, a recent 5-year longitudinal study showed that feedback from coworkers and medical colleagues led to small-to-moderate increases in performance ratings on subsequent assessments.\textsuperscript{57}

In summary, peer assessments have a role in physician lifelong learning related to their ability to address performance domains that are important and not well captured by other methods. In that the practice of medicine is a team-based activity, feedback on interprofessional communication, care coordination, and teamwork is important. Peer surveys implemented in MOC should focus assessment on key behaviors related to the above domains that are observable and measurable to ensure credible and actionable results. Validity and feasibility research should continue to evaluate whether global rating scale limitations impact the quality of feedback provided, factors that impact physician perceptions of and motivation to act on rating results, and the cost-effectiveness and unique contributions of peer ratings to assessment, lifelong learning, and improvement within the MOC program.

**MOC Part II**

Part II of the MOC process is focused on education and learning. The goal of MOC Part II activities is to empower the physician to accept responsibility for their own learning strategy and provide them with access to tools to guide their learning and practice improvement activities. In MOC, the learning activities are embedded in a comprehensive assessment program that supports identification of physician learning and improvement needs. Indeed, a portion of the CME activities in Part II must be based on an external objective assessment. The requirement for externally guided self-assessment is important given concerns regarding the inaccuracy of physician self-assessment.\textsuperscript{14,15} When the physician is enabled to identify his/her learning needs and when resources are made available to assist the physician to bridge the gaps that have been identified, that is where the most effective change can take place.\textsuperscript{66} MOC Part II programs are designed to do this; learning resources may be provided by the ABMS member boards, professional societies, academic institutions, or other parties.

There is a growing body of evidence suggesting that selected lifelong learning strategies are effective in bridging the gap between best evidence and physician performance and patient outcomes.\textsuperscript{57–69} In-depth reviews of the effectiveness of CME show a small to moderate association between CME formats and improvement in physician performance, delivery of patient care, and patient health outcomes. A review of 99 randomized controlled trials over 2 decades found that 70% of the studies demonstrated positive change in physician performance and 48% showed positive changes in patient health outcomes.\textsuperscript{70} An Agency for Health Research and Quality (AHRQ)-commissioned review of the literature showed that
CME was effective in impacting knowledge acquisition and retention (79% of studies reviewed), professional attitudes (85%), skills (80%), practice behaviors (58%), and clinical outcomes (42%). An ongoing Cochrane review of the effects of CME strategies has revealed positive outcomes in both professional practice of physicians and health care outcomes of patients. CME activities result in greater positive findings when: (1) there are multiple exposures to material in a CME live session; and (2) when multiple media types and educational techniques are utilized.

The ABMS committee charged with developing standards for MOC is currently considering criteria for CME credit in MOC that includes the above characteristics, encompasses the 6 general competencies, and provides mechanisms for integrating the assessment activities in Parts I, III, and IV with the educational elements in Part II. These standards will apply to all CME supporting compliance with MOC requirements, whether provided by the boards or other parties.

In summary, there is a growing body of literature defining the characteristics of CME activities that are most likely to result in improved knowledge, skills, and quality of care. In defining the standards for MOC Part II, the ABMS and member boards can now implement requirements that address the need for evidence supporting both the clinical content and the educational methods used in the learning activities. An important area of focus moving forward is to understand how CME and self-assessment in Part II best interact with activities in Parts I, III, and IV, and how all of these parts working together can be optimized to improve learning and health care quality outcomes.

**MOC Part III**

Medical knowledge and clinical diagnostic reasoning are the competency domains targeted by MOC Part III. Cognitive theory research suggests that physicians need both a sound content knowledge base and strong clinical skills to create an appropriate problem representation. Problem representation is the synthesis process physicians use to develop a differential diagnosis, or in other words, what they believe is the cause of the patient’s problem. Appropriate problem representation is critical to quality patient care in that diagnostic errors are often due to faulty synthesis of clinical findings rather than systems errors. Clinical diagnostic reasoning has been recognized as an important component of physicians’ competence by medical school, residency, and fellowship programs, and licensing and certifying bodies.

Research findings showing, on average, declining knowledge and cognitive skills for many physicians over time, coupled with an inability to accurately self-assess one’s knowledge and skills deficits, strongly suggest the need to conduct a periodic reexamination which assures the public that physicians possess the requisite knowledge and clinical diagnostic reasoning skills to manage the types of clinical problems they may encounter during their practice. Research from the American Board of Internal Medicine suggests that declining knowledge over time may be more reflective of failure to acquire new knowledge, as opposed to loss of baseline knowledge. In addition, patients expect physicians to not only be certified in their practice specialty, but specifically undergo a periodic reexamination of their cognitive skills.

There is a substantial body of research that supports the validity of initial certification examinations and has applicability to the similar examinations used in MOC. For example, certification exam scores correlate with the quality of physicians’ prior educational experiences; physicians trained in US medical schools perform better than those trained in international medical schools and physicians’ native language is not correlated with exam performance. The nature and amount of graduate medical education training (formal residency and fellowship training) has also been shown to be related to better exam performance. Specifically, those with more training in geriatric and critical care medicine do better on related examinations than those without formal training or with less time in formal training. In addition, physicians who either withdrew or were dismissed from a graduate medical education program were less likely to be board certified. For the MOC examinations in Internal Medicine and Surgery, the amount of CME activities is positively related to MOC exam performance.

Examination performance has also been shown in several studies to be related to other measures of clinical performance. Ratings of clinical competence by residency program directors correlate with exam scores so that those rated higher achieve higher exam scores. Physicians who change programs more frequently or have lower ratings of overall clinical competence typically have lower exam scores. Likewise, exam scores have been shown to be correlated with peer assessments of physicians’ clinical performance. Complexity of the problems presented by physicians’ patient panel are related to MOC exam performance for critical care medicine. Exam scores are also related to professionalism in that higher scores predict a decreased risk for future disciplinary action.

Although comparison with other measures of physician competence are valuable, the study of the relationship between exam performance and patient care and health outcomes provides more compelling evidence supporting such examinations. Evidence exists to support the link between board certification (sometimes specific board scores) and quality patient care. A meta-analysis of the literature prior to July 1999 found that of those studies that used appropriate methodology, there were 16 findings that showed a positive association between board certification and quality of patient care. For example, board-certified physicians were more
likely to provide preventive care services and show improved outcomes for some measures (eg, lower mean glycosylated hemoglobin levels for diabetics); board-certified surgeons had better outcomes for peptic ulcer disease surgery; and board-certified physicians were more likely to provide recommended prenatal treatments for pregnant women, and infants had few lower birth weights.

Research findings after July 1999 show another 18 studies with positive relationships between certification and quality. For example, studies involving patients with acute myocardial infarction demonstrated a link between physician board certification and higher compliance with evidence-based processes of care, as well as significant reductions in mortality and length of stay in the hospital. For midcareer anesthesiologists, lack of board certification is associated with higher mortality rates, and being board certified in surgery is associated with lower complication and mortality rates for colorectal surgery. Using data drawn from a pool of 124 total performance measures for 23 subspecialty areas in commercial health plans in Massachusetts, I study showed that board certification was modestly related to better performance on composite measures. Although many of the studies to date have focused on initial board certification examinations, more recent research demonstrates a positive relationship between MOC examination performance and the care of hypertension and diabetic patients and in obtaining screening mammography where indicated.

In summary, there is strong theoretical and empiric evidence supporting the need to periodically assess the knowledge base and cognitive skills (in particular, diagnostic reasoning) of physicians. The question for the ABMS and member boards is not whether to include knowledge assessment in MOC, but how best to do so as MOC is evolving into a more robust improvement framework. Moving forward, alternative strategies to the current examination format should be considered for ensuring that both practice- and specialty-relevant knowledge are addressed in a manner that synergistically links knowledge assessment in Part III to knowledge acquisition in Part II and health care quality improvement in Part IV. On behalf of the public, this work will need to done very carefully, given the evidence supporting the current examination format.

**MOC Part IV**

The primary goal of MOC Part IV is to help physicians assess and improve the quality and safety of health care. Quality improvement (QI) is defined as “the combined and unceasing efforts of everyone—health care professionals, patients and their families, researchers, payers, planners, and educators—to make changes that will lead to better patient outcomes (health), better system performance (care), and better professional development (learning).”

The Institute of Medicine reports *To Err is Human* and *Crossing the Quality Chasm* concluded over a decade ago that our health care system is unsafe, ineffective, inefficient, not patient-centered, inequitable, and difficult to access for timely care. As noted earlier, McGlynn and colleagues found that the majority of Americans received just a little over half of the recommended evidence-based care across multiple conditions and services. The United States also compares unfavorably with many other health systems internationally. In a study highlighted by the Commonwealth Fund, the United States ranked last among 16 comparable countries in preventable mortality despite spending almost twice as much per capita for health care. Progress in improving this situation has been disappointingly slow. The Agency for Healthcare Research and Quality (AHRQ) 2010 report found that while almost two-thirds of 179 total measures of health care quality showed some improvement, the overall median rate of change was only 2.3% per year, with the median rate of change in outcomes being only 1.6% per year.

A distinguishing feature of MOC Part IV is the requirement to act on performance data to improve quality of care through changes to the local health care systems using evidence-based QI methods. Physicians can meet the goals of MOC part IV through 1 of 2 primary pathways: (1) assessment of their own individual practice using some combination of performance-based methods that examine actual physician practice; and (2) involvement in group, institutional, and/or national QI projects or ongoing programs.

**Individually Focused Pathway.** In the individually driven pathway, the physicians can use performance data from medical record audit, registries, claims-based data, patient and peer surveys and other tools that evaluate the quality of care they deliver to patients within a practice or system. As noted earlier, substantial research shows physician inability to accurately self-identify gaps in performance without externally derived quantitative or qualitative performance data. Assessment of patient quality data provides the physician an opportunity to uncover unknown gaps in their actual practice. The Part IV component also provides an opportunity across specialty boards to meaningfully confront the substantial quality problems currently affecting the US health care system.

One of the principal methods used in the individually focused MOC Part IV pathway is audit and feedback. Several systematic reviews have found audit and feedback alone can produce meaningful, although modest, improvements in care. Audits can be accomplished through the use of chart review, registries, claims data, and patient surveys. However, the most important factor is what the physician...
does with the feedback results. In investigating how physicians respond to performance data as part of self-directed assessment seeking processes, Sargeant found a complex and dynamic interplay between internal and external conditions involving the physician’s practice, the source of the performance data, how the performance information was interpreted, and tensions within the environment that led to variable responses to the performance information and feedback.\textsuperscript{129} In a follow-up paper, Sargeant found that participants in self-directed assessment activities reported that receiving objective performance data on quality measures, patient input through surveys about their care experience, and supportive and useful data from peers were all factors that enhanced the effectiveness of self-directed activities.\textsuperscript{130} These findings are consistent with experiential learning theories and align with the goals of MOC Part IV.

For example, the ABIM added a self-assessment of practice performance requirement to their program in 2006.\textsuperscript{126} To help physicians meet this requirement, ABIM developed Web-based tools—Practice Improvement Modules (PIMs)—that allow physicians to examine elements of their practice and to receive feedback from peers and patients. The majority of physicians, but by no means all, were very satisfied with the PIM experience and also self-reported behavior changes in practice.\textsuperscript{131–133} Several pre-post studies and 2 randomized comparative trials found the PIMs can help facilitate improvements in care.\textsuperscript{134,135} and a pre-post study in a residency clinic also found substantial improvements in preventive care.\textsuperscript{136} Much work remains to be done, but a specific MOC Part IV multifaceted assessment tool, the PIM, based on solid theory and empirical evidence from other fields, shows promise in helping physicians improve the care they provide as part of the MOC process. Early data from the PIMs demonstrate that an instrument designed for evaluation of performance in practice can be a catalyst for improvements in patient care. The primary limitation of these individual assessment tools is the time and effort required to enter data into the Web-based forms; future methods will need to leverage information technology to reduce the data collection burden so as to maximize the primary objective of the assessment process—review and analyze data that catalyzes improvements in care. Future methods also need to more effectively emphasize the team-based nature of QI.

**Project and Institutionally Focused Pathway.** While individually focused pathways, using performance-based assessment data, can lead to meaningful changes, QI is often performed as a team activity. For example, physicians using the ABIM PIMs are strongly encouraged to involve other members of their team in completing the QI activity and can complete PIMs with a group of physicians working together. A growing number of boards are actively engaging and promoting physician involvement in ongoing, effective QI initiatives and programs for MOC Part IV credit. The QI projects that meet the boards’ standards can be conducted within the physician’s practice or health care system.

Examples come from the American Board of Pediatrics (ABP) and the American Board of Pathology (ABPath). In 2006, the ABP established standards for valid and credible quality improvement projects using published, accepted guidelines.\textsuperscript{137,138} Along with these evidence-based standards for projects and QI activities, the ABP concomitantly developed standards for meaningful participation in team-based activities so that physicians could receive MOC Part IV credit where appropriate.

The institutionally based pathway helps to accomplish several goals. First, it encourages physicians to engage directly in meaningful QI initiatives that facilitate their own systematic acquisition and continued professional growth of knowledge, skills, and attitudes in QI science and methods. Second, it fosters teamwork competencies that have traditionally not been strengths of physician training and practice.\textsuperscript{139} Third, this approach helps to maximize the impact of QI, especially when the physician works in larger group practices, hospitals, or health care networks. The trend toward patient-centered medical homes and accountable care organizations\textsuperscript{140,141} will further the need for this type of QI activity as small practices join new practice models and networks.

Two activities approved for MOC Part IV credit by the ABP have demonstrated substantial impact on improving care. The Cystic Fibrosis (CF) Foundation–sponsored QI collaborative publically shares CF center–specific quality-performance data to help CF centers to identify and learn from high performing, quality “benchmark” centers.\textsuperscript{142} The impact of this collaborative has significantly affected the lives of children with CF. Another national-level collaborative approved by the ABP is the initiative to eliminate catheter-related infections in pediatric intensive care units. Sponsored by the National Association of Children’s Hospitals and Related Institutions, this project has significantly reduced catheter-related infections with resultant reductions in mortality, morbidity, and costs.\textsuperscript{143}

Based on these experiences and others, multiple certification boards in partnership with the ABMS are now working together to expand this MOC Part IV pathway to more physicians and institutions.\textsuperscript{2,144} This pathway is appealing to hospitals and health care networks because it helps physicians meet their MOC requirements while concomitantly helping the institution to engage physicians in meaningful cross-cutting QI initiatives. The ABPath’s Part IV program includes essential evidence-based components: (1) required documentation of the accreditation status of the laboratory where the pathologist practices; (2) mandatory participation and documentation in interlaboratory performance improvement and quality assurance programs appropriate for the
procedures performed in the laboratory; and (3) each diplomate “must participate in at least one laboratory performance improvement and quality assurance activity or program per year appropriate for his/her principal professional activities.”

The QI activities can involve national initiatives that target important care activities such as quality of specimen collection, turnaround times, reporting errors, patient identification, and diagnostic accuracy. Quality assurance and improvement have been a major focus of the pathology community, and the inclusion of evidence-based methods and activities has now been incorporated into the ABPath MOC Part IV program.

Across the majority of ABMS specialty boards, diplomates enrolled in the MOC program can now engage in evidence-based approaches at the individual, group, institutional, or interinstitutional level. The examples and evidence noted above highlights that the Part IV options align well with the stated goals of MOC Part IV and with the essential physician competencies of practice-based learning and improvement (PBLI) and systems-based practice (SBP). As the evidence and experience in quality and safety science, as well as the evolving nature of PBLI and SBP as physician competencies, grows and deepens, these findings and evidence will guide improvements to the Part IV component of MOC.

In summary, Part IV is evolving into a major and clinically important element of MOC and when designed well is most relevant to a physician’s actual practice. It is the primary means for addressing the PBLI and SBP competencies and also for the Patient Care competency regarding care patients actually receive. There is an evidence base supporting the value of QI generally, and within the context of MOC participation “evidence” is continuously generated as part of the physician’s individual activities in meeting Part IV requirements. As the ABMS and member boards continue to implement Part IV QI requirements, research and development should continue to focus on introducing measures to address important public health issues, tailoring methods and performance measures within individual specialties to enhance practice through relevant patient care data, and evaluating Part IV in relation to the other MOC parts to support continued improvement in the cost-effectiveness of MOC. In addition, continued work to align Part IV with other accountability initiatives, as exemplified above, will help ensure that important health care quality issues are addressed, and is responsive to one of the primary concerns about the redundancy and cost-effectiveness of MOC.

Conclusion

In conclusion, the framework and individual Parts of the MOC program are based on a sound theoretical rationale and evidence-based foundation, target areas of physician competence known to be in need of improvement, and provide a self-directed mechanism to help physicians assess and improve their health care practices in a professional self-regulatory framework. While much work is still needed to evaluate the specific tools currently in use for MOC, such as the patient and peer surveys, the practice improvement modules and other knowledge assessment approaches, substantial work has already been performed. Moving forward with continued implementation of MOC, the specialty board community will need to continue to rigorously evaluate and refine the MOC components and the program as a whole, as the practice of medicine, technology, and the field of assessment evolve.

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Specialty Board Certification in the United States: Issues and Evidence

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Background: The American Board of Medical Specialties (ABMS) certification and maintenance of certification (MOC) programs strive to provide the public with guidance about a physician’s competence. This study summarizes the literature on the effectiveness of these programs.

Method: A literature search was conducted for studies published between 1986 and April 2013 and limited to ABMS certification. A modified version of Kirkpatrick’s 4 levels of program evaluation included the reaction of stakeholders to certification, the extent to which physicians are encouraged to improve, the relationship between performance in the programs and nonclinical external measures of physician competence, and the relationship of performance in the programs with clinical quality measures.

Results: Patients’ and hospitals’ value of board certification and physician participation in MOC are high. Physicians are conflicted as to whether the effort involved is worth its value. Self-reported evidence shows improvement in knowledge, practice infrastructure, communication with patients and peers, and clinical care. Certification performance is generally related to nonclinical external measures such as types of training, practice characteristics, demographics, and disciplinary actions. In general, physicians who are board certified provide better patient care, albeit the results have modest effect sizes and are not unequivocal.

Conclusions: Certification boards should continuously try to improve their programs in response to feedback from stakeholders, changes in the way physicians practice, as well as the growth in the fields of measurement and technology. Keeping pace with these changes in a responsible and evidence-based way is important.

Key Words: physician assessment/remediation, maintenance of certification/licensure, medical/clinical specialty

Specialty boards in the United States evolved to publicly recognize emerging medical areas through a certification process and in 1933 unified as the Advisory Board for Medical Specialties, later renamed the American Board of Medical Specialties (ABMS) in 1970.1 Today, the ABMS consists of 24 member boards with about 750,000 certified physicians, estimated to be nearly 90% of all practicing physicians.2

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The ABMS boards are self-regulating independent medical bodies—purposely separate and independent from physician membership organizations. Traditionally, self-regulation has been the model used in the United States to hold the profession accountable to the public and is seen as a privilege. ABMS boards are an important mechanism of self-regulation.

Each board offers one or more primary certificates and many offer subspecialty certificates. While specialty board certification remains a voluntary process and only an undifferentiated medical license is required to practice in the United States, practically speaking, most physicians choose to certify upon completion of residency and fellowship training. Through certification patients can identify physicians who are competent in a specific specialty. To achieve primary certification by an ABMS certifying board physicians must successfully complete graduate training in programs accredited by the Accreditation Council for Graduate Medical Education (ACGME), possess a valid and unrestricted medical license, and pass a written examination that assesses knowledge of patient care in the specialty. Some boards also require passing an oral exam.3
Overview of the Program for Maintenance of Certification

Initially, many certification programs offered a certificate for life, without any requisite maintenance. Due to concerns over rising medical errors and cost of care, professional self-regulation and a lifetime certificate have been publicly challenged. In 2000, the ABMS answered the challenge by introducing maintenance of certification (MOC) programs, which not only limit the duration of the certificate but offer physicians a more continuous professional development opportunity with the potential to ensure public accountability and transparency about physician performance. The ABMS saw this need for several reasons. First, a physician’s ability to independently and accurately self-assess is poor. Second, more clinical experience does not necessarily lead to better outcomes of care. And third, fewer than 30% of physicians examine their own performance data and try to improve.

The goal of MOC is to ensure the public that physicians are maintaining competence over their career. The framework for MOC is based on the 6 competencies adopted by the ACGME and ABMS in 1999. The program’s implementation is a comprehensive performance measurement of patient care with 4 components: evidence of good professional behavior through an unrestricted license, participation in lifelong learning and periodic self-assessment, passing a cognitive examination of clinical problem-solving skills, and measuring and improving performance in practice. Competence in patient care is a common element in all MOC components. Medical knowledge is assessed in both self-assessment and in the cognitive examination. Competence with interpersonal and communication skills is increasingly assessed by peer and patient feedback in the self-assessment or practice performance assessment parts of MOC. Professionalism is related to licensure as a function of most state medical licensure boards, but is also often assessed through peer and patient feedback tools. Practice-based learning and improvement is integral to part 4 of MOC, namely, performance measurement and improvement. The competence of systems-based practice is gradually being introduced through various self-assessment and practice performance modules. The article by Hawkins and colleagues in this supplement provides detailed information about the theory and evidence base for MOC.

Certification Program Challenges

Since certification is voluntary in the United States, the consequence of not achieving or maintaining certification is mostly driven by the marketplace. Many hospitals use certification as one requirement for being granted hospital privileges, and at least in general internal medicine, a physician’s earning power is slightly lower without the certificate. Certification programs strive to follow standards in the testing industry to achieve a relevant, valid, and reliable assessment based on psychometrics, the science of testing. Simultaneously, programs attempt to help physicians improve by providing feedback on areas of weakness.

Assessment is never popular and criticisms arise about the program’s value. Some physicians object to the cost or time necessary to complete it, or argue that the activities are redundant with what employers require. Others feel the programs do not sufficiently reflect the scope of their practice or the real-world way in which they practice. Yet many physicians participate in the programs and report that MOC is important to their professional image, helps them update their knowledge, and improves the quality of their patient care.

Purpose of the Study

To better evaluate the effectiveness of certification and MOC programs, we examined the peer-reviewed medical literature using a modified version of Kirkpatrick’s framework for program evaluation. Unlike a planned formal program evaluation, we examined what we know about the programs’ effectiveness retrospectively. As such, we based our review on issues important to program evaluation organized into the following 4 categories: Reaction, Learning and Improvement, Nonclinical External Measures, and Clinical Quality of Care Measures.

Method

We limited our literature search to peer-reviewed journals written in English focusing on certification and MOC programs of the ABMS. Since Sharp and colleagues’ review yielded important articles beginning in 1986, we began with articles published in 1986 through April 2013. We excluded opinion pieces, literature reviews, and studies that did not focus on ABMS boards. We used the EBSCO database which included Academic Search Premier, PubMed, Medline, Educational Research Information Clearinghouse (ERIC), and PsychInfo. We also reviewed the references from the studies that were drawn to ensure that our search did not miss important works. The subject headings included physician, certification, maintenance of certification, medicine, attitude, value, learning, improvement, clinical outcomes, clinical processes, quality of patient care, quality of health care, examination, and knowledge. Abstracts were first reviewed by 3 researchers to determine if they were relevant to ABMS boards and fit within the 4 categories; all inconsistencies in categorizations were resolved among the researchers. The full-text papers for the relevant abstracts were then obtained to interpret the findings.
The measures we examined addressed the effectiveness of the programs and were placed into the 4 categories:

1. Reaction: The reaction of stakeholders (i.e., physicians, patients, and hospital administrators) in terms of customer satisfaction, opinions about the programs, and certification participation rates.

2. Learning and Improvement: The extent to which physicians are encouraged to learn and improve with respect to the six ACGME/ABMS competencies.

3. Nonclinical External Measures: The extent to which there is a relationship between performance in certification programs and external measures of physician characteristics and competence, including location of training, training program director assessments, practice characteristics, physician demographics, and malpractice/disciplinary actions.

4. Clinical Quality of Care Measures: The extent to which there is a relationship between performance in certification programs and clinical process and outcome measures from the physician’s practice.

Results

Our literature search yielded 1,737 articles for review. Of these articles, 1,659 did not meet inclusion criteria or contribute to the 4 categories. The final number of articles used was 78.

Reaction

We identified 10 studies that dealt with stakeholders’ reactions to certification or MOC (TABLE 1). Patients of family physicians find that board certification is more important in choosing a physician than any other physician demographic characteristic. For internal medicine and pediatrics, most patients report they would change physicians if they were found not to be certified. Patients expect physicians to be evaluated by patients, nurses and other physicians and pass a written test of clinical knowledge at regular intervals. Although responses of patients are positive towards certification, it is unclear how much they truly understand about the program requirements and expectations of physicians.

Physicians’ reasons for participating or not participating in MOC vary. Although most participate (eg, 87% for internal medicine and 91% for family medicine) and do so to maintain their professional identity, to update knowledge and improve patient care, many physicians are concerned over the cost and time commitment, and consider some assessments irrelevant to their specific practice. Physicians with lifetime certificates in pediatrics (and who do not, therefore, need to participate in MOC) are more willing to participate in MOC for a subspecialty rather than for general pediatrics, but most disagree that MOC is necessary for keeping up-to-date in clinical pediatrics. Anesthesiologists value self-assessment activities over passing a high-stakes exam or practice improvement activities but, regardless, they continue to value board certification. Plastic surgeons report that certification plays a role in the selection process for employment and family medicine physicians who practice in poorer neighborhoods or in solo practice are less likely to participate. Finally, more than 80% of hospitals now require certification for pediatricians, almost 6 times more than 5 years ago.

Learning and Improvement

We found 13 studies that addressed the extent to which lifelong learning, periodic self-assessment, and quality improvement are effective in MOC (TABLE 2). Learning through self-assessment take-home knowledge modules in critical care medicine is correlated with high-stakes MOC exam performance. Practice improvement modules (PIMs) in disease-specific areas such as diabetes, asthma, and preventive cardiology provide improvement opportunities that are actionable especially when physicians are given reliable composite measures. Changes to practice infrastructure, clinical care, and communication with patients and peers then become more likely. Physicians describe having improved their ability to answer questions at the point-of-care, professionalism and teamwork behaviors, supervision of residents’ clinical care, and general knowledge of quality improvement through MOC activities. Although quality improvement is important to patient care, not all physicians understand how to apply the principles. Some studies note that practice-level collaboration and coaching may enhance the MOC practice improvement requirement.

Nonclinical External Measures

One approach to evaluating the validity of certification programs is to demonstrate that performance is correlated with external measures of physician competence. We found 26 studies with nonclinical external measures including prior educational experiences, supervisor’s rating of clinical competence, patient volume, malpractice claims/disciplinary actions, and other standardized exam scores (TABLE 3). Research shows that certification exam performance is correlated with location of medical school training. An older study found that internationally trained physicians had poorer exam performance regardless of where they were born, but later studies suggest that non-US born international medical school graduates do better than international graduates born in the United States. Physicians in programs with a favorable fellow-to-faculty ratio and reasonable months of fellowship training typically perform better. The nature and amount of residency and fellowship training for critical care and geriatric medicine and research pathway candidates is also related to better certification exam
### TABLE 1. Studies Examining the Stakeholder Reaction to Certification

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author</th>
<th>Specialty (# of subjects)</th>
<th>Reaction</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Engstrom (1998)</td>
<td>Family physician (221 patients)</td>
<td>The type of information that is valuable when choosing a physician</td>
<td>Of the demographic information, certification was most valued</td>
</tr>
<tr>
<td>15</td>
<td>Brennan (2004)</td>
<td>Internal medicine (1,001 patients)</td>
<td>The public expectation of physician selection and assessment</td>
<td>Public values certification; Expect physicians to be evaluated by patient, physicians and nurses</td>
</tr>
<tr>
<td>25</td>
<td>Freed (2009)</td>
<td>Pediatrics (916 physicians with lifetime certification)</td>
<td>1. MOC participation rate 2. Reasons for participating in MOC 3. Opinions about consumer’s knowledge</td>
<td>1. Few participated in general pediatrics MOC but half of subspecialists would participate in subspecialty MOC 2. Most disagreed that MOC is necessary for keeping up-to-date in clinical pediatrics 3. Few believed consumers understand MOC</td>
</tr>
<tr>
<td>24</td>
<td>Freed (2010)</td>
<td>Pediatrics (2,245 patients)</td>
<td>The public expectation of physician selection and assessment</td>
<td>Important for physicians to be assessed on quality of care; Important to receive high ratings from patients; Important to pass a written test at regular intervals; Important for selection were recommendations from friends and certification; Important to maintain certification</td>
</tr>
<tr>
<td>26</td>
<td>Xierali (2011)</td>
<td>Family medicine (70,323 physicians)</td>
<td>1. MOC participation rates 2. Those working in a poorer neighborhood 3. Those working in solo practice 4. Male physicians 5. US/foreign born and international medical graduates</td>
<td>1. 91% participating 2. Less likely to participate 3. Less likely to participate 4. Less likely to participate 5. Less likely to participate</td>
</tr>
<tr>
<td>27</td>
<td>Puffer (2012)</td>
<td>Family medicine (11,288 physicians)</td>
<td>MOC participation rates</td>
<td>MOC participation rates are higher than anticipated after transition to MOC (91%)</td>
</tr>
<tr>
<td>28</td>
<td>Culley (2013)</td>
<td>Anesthesiology (627 physicians)</td>
<td>Physician satisfaction pertaining to certification</td>
<td>Certification valued in demonstrating competence; Self-assessment perceived to be more valued than high-stakes exam or practice improvement</td>
</tr>
</tbody>
</table>

(Continued)
TABLE 1. Continued

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author</th>
<th>Specialty</th>
<th>Reaction</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Freed (2013)</td>
<td>Pediatrics</td>
<td>Credentials use of certification and MOC</td>
<td>80% require certification of general pediatrics, 86% for pediatric specialists; MOC is being included in privileging policies</td>
</tr>
<tr>
<td>29</td>
<td>Galanis (2013)</td>
<td>Plastic surgery</td>
<td>Physician selection for employment</td>
<td>Surgeon reputation and certification most important factors in selection process</td>
</tr>
</tbody>
</table>

MOC = maintenance of certification; US = United States.

performance.48–50 Physicians who receive higher ratings for clinical competence from their training programs typically have higher certification exam scores.46,51–53 In addition, trainees who change programs more frequently have lower exam scores.43 Likewise, scores on the United States Medical Licensing Examination are significantly correlated with certification scores.54 Physicians who are white, and with less debt, are more likely to become certified.55 Higher scores on internal medicine exams predict a decreased risk for future disciplinary action.56,57 Some early studies show negative findings in that certified surgeons have higher malpractice claims and disciplinary rates possibly due to more complicated patients,58,59 but they are less likely to have insurance coverage terminated due to malpractice.60 In family medicine those certified are less likely to have non-standard malpractice coverage.61 Complexity of patient problems and patient volume are related to better exam performance for cardiovascular disease, critical care, and geriatric medicine.49,62 Yet, certification is not associated with physicians’ cost of care profiles.63 Those certified typically have higher annual income and those scoring highest on the exam have a greater likelihood of career satisfaction.14

There is a richer research base for certification and its relationship with external measures than for MOC, since MOC is only a decade old; however, research on MOC is beginning to appear in the literature. Not surprisingly, being in solo practice and older are associated with lower MOC exam scores.64 Likewise, for family medicine, those practicing in poorer neighborhoods, in solo practice, males, and international medical graduates are less likely to participate in MOC.26 For internists, those who use more electronic resources in their everyday work, are educators, and are in inpatient practice have slightly higher MOC exam scores.65 Family physicians who maintain certification achieve higher scores than recent graduates.66

In summary, certification is related to many nonclinical external measures that address different aspects of physician characteristics and competence, and most are in the expected direction. Some relationships have changed over time; for example, international medical graduates continue to improve their performance as their training and selection into United States residency programs have changed.67 Therefore, monitoring these relationships over time is important.

Clinical Quality Measures

The last category addresses whether certified physicians provide higher-quality patient care than noncertified physicians. These research studies are challenging because evidence-based guidelines do not exist in all specialty areas, and even if they do, are subject to measurement error—there are not always enough patients per physician to obtain a reliable and valid measurement. Standardization of data is problematic and methodology is hampered by issues of physician attribution and lack of good controls for differences in patient health and adherence.68,69 Despite these limitations, researchers strive to better understand the relationship between board certification and clinical quality measures. We found 29 studies spanning a variety of specialty areas (TABLE 4). Not all studies demonstrated positive relationships between certification and clinical measures, but the majority did.

Studies show certified surgeons are more likely to have lower mortality rates for peptic ulcer surgery, colorectal surgery (and complications) but not for mortality related to stomach cancer70,71 or for complications from carotid endarterectomy surgery.72 One study shows no difference in mortality or complications for abdominal aortic aneurysm repair, while another shows certified physicians do better (8.9% lower mortality rate).70,73 Similarly, certified vascular surgeons have a 15% and 24% lower mortality and complication rate for post carotid endarterectomy and post abdominal aneurysm repair, respectively, but not for post lower leg bypass graft.74 Another study shows that certified orthopedic surgeons are no different from noncertified in rates of postoperative pain, or physical/mental functioning.75 Lower mortality rates for acute myocardial infarction are associated with certification in cardiovascular disease,
### TABLE 2. Studies Examining the Relationship Between Certification and *Learning and Improvement*

<table>
<thead>
<tr>
<th>First Author</th>
<th>Specialty</th>
<th>Ref. # (publication year)</th>
<th>(# of subjects)</th>
<th>Learning/Improvement</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 Lipner (2002)</td>
<td>Internal medicine (356 physicians)</td>
<td>Peer and patient feedback</td>
<td>Opportunities for improvements in physician communication skills in MOC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 Holmboe (2006)</td>
<td>Internal medicine (14 physicians)</td>
<td>Diabetes Practice Improvement Module comprised of chart audit, patient survey and system survey</td>
<td>Physicians found the improvement tool helpful in providing important information about the practice and a quality improvement specialist helped improve their practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Lipner (2007)</td>
<td>Internal medicine (626 physicians)</td>
<td>Diabetes Practice Improvement Module comprised of chart audit, patient survey and system survey</td>
<td>Quality Performance measures help provide physicians with actionable improvement for clinical care, communication with patients, and changes to the practice infrastructure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 Simpkins (2007)</td>
<td>Internal medicine (40 physicians)</td>
<td>Asthma Practice Improvement Module comprised of chart audit, patient survey and system survey</td>
<td>Positive impact on asthma severity but not prescription filling.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34 Duffy (2008)</td>
<td>Internal medicine (179 physicians)</td>
<td>Preventive Cardiology Practice Improvement Module comprised of chart audit and system survey</td>
<td>Helps physicians initiate a cycle of quality improvement in their practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 Caverzagie (2009)</td>
<td>Internal medicine (23 physicians)</td>
<td>Hospital-based Practice Improvement Module</td>
<td>Physicians reported learning quality improvement principles, added value to practice, increased awareness of quality improvement process.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38 Bernabeo (2013)</td>
<td>Internal medicine (40 physicians)</td>
<td>Professionalism in the form of vignettes</td>
<td>Participants found the vignettes to be authentic and a means to reflect on professional behavior in a practical way.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39 Chesluk (2012)</td>
<td>Hospital medicine (25 physicians)</td>
<td>Teamwork module assessing the individual physician’s role</td>
<td>Identifies areas for individual improvement in a team-based setting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 Reddy (2012)</td>
<td>Internal medicine (644 faculty)</td>
<td>Clinical Supervision Practice Improvement Module</td>
<td>The activity improved faculty skills in the supervision of trainees and led to self-reported changes in supervisory practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 Fisher (2013)</td>
<td>Family medicine (348 physicians)</td>
<td>Quality improvement initiatives</td>
<td>Practice-level collaboration, access to a practice coach and tailored support, flexibility in choosing improvement project and involvement with professional affiliations can enhance the MOC practice improvement requirement.</td>
<td></td>
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</tr>
</tbody>
</table>

MOC = maintenance of certification.
<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author (publication year)</th>
<th>Specialty (# of subjects)</th>
<th>Nonclinical External Measures</th>
<th>Results*</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>Norcini (1986) Internal medicine (767 physicians)</td>
<td>1. International medical graduates 2. Program director ratings 3. Number of programs changes</td>
<td>1. Certification exam scores lower (Cohen’s $d = 1.21$) 2. Certification exam scores correlated ($r = 0.40$) 3. Certification exam scores correlated ($r = -0.17$)</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Norcini (1987) Internal medicine (1,848 physicians)</td>
<td>1. Better program experience 2. US medical licensure exam scores</td>
<td>1. Certification exam scores higher (2% of variance explained) 2. Certification exam scores correlated ($r = 0.80$)</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Norcini (1987) Internal medicine (26,950 physicians)</td>
<td>Program director ratings of clinical competence</td>
<td>Certification exam scores correlated ($r$ ranges from 0.19 to 0.41 for medical knowledge)</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Norcini (1989) Critical care medicine (2,712 physicians)</td>
<td>1. More formal training 2. Program director ratings 3. Time in ICU practice</td>
<td>1. Certification exam scores higher ($r = 0.23$) 2. Certification exam scores correlated ($r = 0.30$) 3. Certification exam scores correlated ($r = 0.11$)</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Schwartz (1989) Several specialties (920 physicians)</td>
<td>Non-standard malpractice coverage</td>
<td>Family physicians with non-standard malpractice coverage were less likely to be certified (28 percentage points); No difference for other specialties</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Shea (1989) Internal medicine (14,340 physicians)</td>
<td>US citizen Caribbean medical school graduates</td>
<td>Certification exam scores lower (&gt;1 standard deviation difference)</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Sloan (1989) Many specialties (332 physicians)</td>
<td>Malpractice claims</td>
<td>Certified in obstetrics/gynecology and surgery more likely to have malpractice claims (8 and 19 percentage points, respectively); no difference for other medical groups</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Steel (1989) Geriatrics (4,282 physicians)</td>
<td>1. Patient volume 2. University/larger community 3. Solo practice/for profit</td>
<td>1. Geriatric medicine certification exam scores correlated ($r$ ranged from 0.07 to 0.28, depending on clinical setting) 2. Higher geriatric medicine certification exam scores (Cohen’s $d = 0.68$) 3. Lower geriatric medicine certification exam scores (Cohen’s $d = 0.35$)</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Norcini (1991) Internal medicine (18,036 physicians)</td>
<td>Non-US citizens, international medical graduates</td>
<td>Certification exam score improvements over time (2% mean increase)</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Shea (1993) Internal medicine (17,943 physicians)</td>
<td>Program director ratings</td>
<td>Certification exam scores correlated ($r &gt; 0.20$)</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Norcini (1995) Cardiovascular disease (95 programs)</td>
<td>1. Fellow-to-faculty ratio 2. Months of fellowship training 3. Program director ratings</td>
<td>1. Certification exam scores negatively correlated ($r = -0.15$) 2. Certification exam scores correlated ($r = 0.34$) 3. Certification exam scores correlated ($r = 0.37$)</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Norcini (1996) Cardiovascular disease (560 physicians)</td>
<td>1. Internal medicine certification exam scores 2. Program characteristics</td>
<td>1. Cardiology certification exam scores correlated ($r = 0.69$) 2. Cardiology certification exam scores correlated (14% of the variance explained by the set of program characteristics)</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
TABLE 3. Continued

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author (publication year)</th>
<th>Specialty (# of subjects)</th>
<th>Nonclinical External Measures</th>
<th>Resultsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Adamson (1997)</td>
<td>Surgery (427 physicians)</td>
<td>Malpractice claims</td>
<td>Certified surgeons less likely to have insurance coverage terminated due to malpractice (14 percentage points)</td>
</tr>
<tr>
<td>56</td>
<td>Morrison (1998)</td>
<td>Many specialties (750 physicians)</td>
<td>Disciplinary actions from the Medical Board of California</td>
<td>Certification associated with lower disciplinary rates [OR, 0.42; 95% CI = 0.29 – 0.60]</td>
</tr>
<tr>
<td>62</td>
<td>Norcini (2000)</td>
<td>Critical care medicine (1,140 physicians)</td>
<td>Volume of complex cardiovascular patient problems</td>
<td>Cardiology content domain scores correlated (Cohen’s d of 1.1 to 1.7)</td>
</tr>
<tr>
<td>53</td>
<td>Reshetar (2000)</td>
<td>Critical care medicine (7,047 physicians)</td>
<td>Program director ratings</td>
<td>Certification exam scores correlated (r = 0.30)</td>
</tr>
<tr>
<td>57</td>
<td>Papadakis (2008)</td>
<td>Internal medicine (66,171 physicians)</td>
<td>Disciplinary actions</td>
<td>Certification exam scores (2.5% risk for lowest scores to 0.0% for highest scores)</td>
</tr>
<tr>
<td>55</td>
<td>Jeffe (2011)</td>
<td>Medical school graduates (42,440 physicians)</td>
<td>1. White physicians 2. Amount of debt 3. USMLE scores</td>
<td>1. IM certification more likely (p &lt; .001) 2. IM certification more likely (p = .02) 3. IM certification more likely (p &lt; .001)</td>
</tr>
<tr>
<td>64</td>
<td>Lipner (2011)</td>
<td>Internal medicine (18,477 physicians)</td>
<td>1. Solo practice 2. US medical school graduates 3. Younger physicians</td>
<td>1. MOC exam scores lower ($R^2$ change = 0.01) 2. MOC exam scores higher ($R^2$ change = 0.004) 3. MOC exam scores higher ($R^2$ change = 0.001)</td>
</tr>
<tr>
<td>26</td>
<td>Xierali (2011)</td>
<td>Family medicine (70,323 physicians)</td>
<td>1. Overall MOC participation 2. Poorer neighborhoods 3. Solo practice 4. Male physicians 5. US or foreign born and international medical graduates</td>
<td>1. High at 91% in MOC 2. MOC less likely [OR = 1.10 (1.03 – 1.17)] 3. MOC less likely [OR = 2.06 (1.91 – 2.23)] 4. MOC less likely [OR = 1.14 (1.14 – 1.15)] 5. MOC less likely [OR = 1.05 (0.90 – 1.22)]</td>
</tr>
<tr>
<td>14</td>
<td>Gray (2013)</td>
<td>Internal medicine (2,331 physicians)</td>
<td>1. Annual income 2. Career satisfaction</td>
<td>1. Certified better (18%-+ income) 2. Those with highest certification exam scores (9% increased likelihood of career satisfaction)</td>
</tr>
<tr>
<td>50</td>
<td>Lipner (2012)</td>
<td>Internal medicine (101,031 physicians)</td>
<td>Internal medicine certification examination scores</td>
<td>Physicians trained via the research pathway were comparable to physicians trained via the traditional pathway</td>
</tr>
<tr>
<td>63</td>
<td>Mehrotra (2012)</td>
<td>Many specialties (12,116 physicians)</td>
<td>Cost profile score for acute, chronic, and preventive care</td>
<td>No difference</td>
</tr>
</tbody>
</table>

(Continued)
Across 23 specialties, certified physicians score higher on a quality performance composite derived from 124 quality measures (3.3 percentage points).<sup>93</sup> Certified endocrinologists provide better diabetes care than certified internalists as measured by a composite score, and those failing to meet a minimum level of competence are more likely to be in solo practice, receive lower ratings from their residency program directors, and perform poorer on the internal medicine exam for both initial certification and MOC.<sup>68,69</sup> Endocrine exam subscores from the internal medicine certification exam are also related to diabetes care.<sup>94</sup> Likewise, certified specialized cardiologists provide less preventive cardiology care than certified general cardiologists or internists who spend more time in preventive consultative care.<sup>95</sup>

### Discussion

We examined the value of board certification by considering four aspects of its effectiveness through appraisal of the peer-reviewed literature. We first considered the extent to which certification is accepted by stakeholders—patients, physicians, and hospital systems. We find that, in general, patients and hospitals value board certification, but that patients, in particular, may benefit from more education about what MOC is and aims to achieve. Physicians are mixed as to whether MOC is worth the effort; however, physicians are participating in MOC at high rates<sup>18,26,27</sup> and hospitals are increasingly using certification to grant hospital privileges.<sup>13</sup> In 2006 about half of those originally certified in internal medicine reported being required to maintain their specialty certificate by at least one employer; we expect that number has grown over the last seven years.<sup>18</sup> In addition, MOC programs can now be included in a federal quality reporting incentive program—the Centers for Medicare & Medicaid

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### TABLE 3. Continued

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author (publication year)</th>
<th>Specialty (# of subjects)</th>
<th>Nonclinical External Measures</th>
<th>Results&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>Reed (2012) Internal medicine (3,958 physicians)</td>
<td>1. Electronic resource use 2. Educators 3. Inpatient practice</td>
<td>1. MOC exam scores correlated ($R^2 &lt; 0.01$) 2. MOC exam scores correlated ($R^2 &lt; 0.01$) 3. MOC exam scores correlated ($R^2 &lt; 0.01$)</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>O’Neil (2013) Family medicine (10,801 physicians)</td>
<td>Participation in MOC</td>
<td>MOC participants have higher exam scores than recent graduates (17-point increase with each successive take of the exam)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Indicates whether board certification or examination scores were significantly correlated with external measures; correlated implies positively correlated. Where available, statistics (eg, percentage point differences, correlations, and confidence intervals) are provided to describe the magnitude of the relationship.

OR = odds ratio; CI = confidence interval; MOC = maintenance of certification; ICU = intensive care unit; US = United States; IM = internal medicine; USMLE = United States Medical Licensing Examination.

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Internal or family medicine.<sup>67,76–79</sup> Certified internists and cardiologists caring for acute myocardial infarction patients are better at prescribing aspirin and beta blockers on admission and discharge but there is no difference for 30-day mortality.<sup>80</sup> Certified family physicians show better flexible fiberoptic sigmoidoscopy performance.<sup>81</sup> Less inappropriate use of spironolactone in congestive heart failure is noted for certified internists and cardiologists.<sup>82</sup> Certified clinical cardiac electrophysiologists have fewer implantable defibrillator complication rates and a higher likelihood of using a cardiac resynchronization device when indicated.<sup>83</sup>

Certified internists provide better preventive care services in areas such as mammography and colon cancer screening but not for influenza or pneumovax vaccinations.<sup>84</sup> One study shows lower hemoglobin A1C levels for diabetic patients of certified internists yet another study shows no difference.<sup>84,85</sup> Internists more recently certified show better treatment for hypertension in diabetic patients.<sup>86</sup> Yet, certified family physicians show equivalent care compared to noncertified physicians for these same measures.<sup>80</sup> For poorer children, certified pediatricians provide immunizations at higher rates (9% absolute difference).<sup>87</sup> Although those certified in obstetrics and gynecology show higher rates of cesarean birth, they also show higher rates of prenatal visits and fewer low-birth-weight infants.<sup>88,89</sup> Noncertified anesthesiologists tend to have higher patient death rates.<sup>90</sup>

One study shows that MOC exam scores are correlated with treatment of diabetic patients for hemoglobin A1C and lipid testing, retinal and mammography screening, but not for lipid testing for coronary artery disease.<sup>91</sup> Another study shows that higher certification exam scores are associated with better performance on overall chronic care and preventive services for internal medicine.<sup>92</sup>
<table>
<thead>
<tr>
<th>Ref. #</th>
<th>First Author</th>
<th>Specialty (# of subjects)</th>
<th>Clinical Quality Measures</th>
<th>Results*</th>
</tr>
</thead>
</table>
| 70     | Kelly (1986) | Surgery (1,241 physicians) | 1. Mortality: peptic ulcer surgery  
2. Mortality: stomach cancer  
3. Mortality: abdominal aneurysm | 1. Certified better (2% lower mortality)  
2. No difference  
3. No difference |
| 76     | Kelly (1987) | Internal medicine (IM) and family medicine (FM) (1,170 physicians) | 1. Mortality for cardiac catheterization (IM)  
2. Mortality for acute myocardial infarction (IM)  
3. Mortality for acute myocardial infarction (FM) | 1. No difference  
2. Certified IM better (3.1% lower mortality)  
3. Certified FM better (4.2% lower mortality) |
| 85     | Ramsey (1989) | Internal medicine (259 physicians) | 1. Preventive care  
2. Hemoglobin A1C for diabetics  
3. Blood pressure control  
4. Patient satisfaction | 1. Certified better (1% to 13.5 percentage point difference)  
2. Certified IM better (1.5 mean difference in A1C level)  
3. No difference  
4. No difference |
| 72     | Brook (1990) | Vascular and thoracic surgeons (1,312 patients from Medicare claims file) | Complications from carotid endarterectomy surgery (due to postoperative stroke or myocardial infarction or death within 30 days after hospitalization) | No difference |
| 88     | Tussing (1993) | Obstetrics and gynecology (1,740 physicians) | Cesarean rates | Certified higher rates (0.8 percentage point difference) |
| 81     | Nelsen (1994) | Family medicine (403 physicians) | 1. Flexible fiberoptic sigmoidoscopy  
2. Colposcopy  
3. Cardiac stress testing  
4. Nasopharyngoscopy | 1. Certified better (31.8 percentage points)  
2. Certified better (16.6 percentage points)  
3. Certified better (19.7 percentage points)  
4. Certified better (18.7 percentage points) |
| 89     | Haas (1995) | Obstetrics and gynecology; family medicine (924 physicians) | 1. More prenatal visits  
2. Fewer low birth-weight infants | 1. Not certified worse [OR = 0.67 (0.54 – 0.85)]  
2. Not certified worse [OR = 1.20 (1.00 – 1.42)] |
| 73     | Rutledge (1996) | Surgery (1,480 physicians) | Frequency of ruptured abdominal aortic aneurysm | Certified better (8.9% lower mortality) |
| 75     | Heck (1998) | Orthopedic surgery (48 surgeons, self-report) | Postoperative pain, physical or mental function, knee function or complications | No difference |
| 74     | Pearce (1999) | Vascular surgery (Comparison group: general surgeons) (531–734 physicians depending on year and procedure) | 1. Mortality/complications post carotid endarterectomy  
2. Mortality/complications post abdominal aneurysm repair  
3. Mortality/complications post lower leg bypass graft | 1. Certified vascular surgeon better (15% lower rate)  
2. Certified vascular surgeon better (24% lower rate)  
3. No difference |

(Continued)
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<tr>
<th>Ref. #</th>
<th>First Author (publication year)</th>
<th>Specialty (# of subjects)</th>
<th>Clinical Quality Measures</th>
<th>Results&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
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<tbody>
<tr>
<td>77</td>
<td>Norcini (2000) Internal medicine (4,546 physicians)</td>
<td>Acute myocardial infarction mortality</td>
<td>Certified better (15% reduction in mortality)</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>Hanson (2001) Pediatrics (60 physicians)</td>
<td>Childhood immunization rates for poor children</td>
<td>Certified better (9% absolute difference in rate)</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Norcini (2001) Internal medicine (8,292 physicians)</td>
<td>Acute myocardial infarction mortality</td>
<td>Certified better (15% reduction in mortality)</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Norcini (2002) Internal medicine, family medicine, cardiovascular disease (4,546 physicians)</td>
<td>Acute myocardial infarction mortality</td>
<td>Certified better (19% lower mortality)</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Silber (2002) Anesthesia (541 physicians)</td>
<td>1. Failure to rescue rates 2. Death</td>
<td>1. Not certified worse [OR = 1.13 (1.01 – 1.27)] 2. Not certified worse [OR = 1.13 (1.00 – 1.26)]</td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>Masoudi (2005) Internal medicine, cardiology (19,226 patients)</td>
<td>Inappropriate use of spironolactone in congestive heart failure</td>
<td>Certified better (4.2 percentage point difference)</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Chen (2006) Internal medicine, family medicine, cardiology (IM = 34,578 ; FM = 21,390; Cardiology = 45,283 physicians)</td>
<td>Acute myocardial infarction 1. Aspirin on admission 2. Beta-blocker on admission 3. Aspirin on discharge 4. Beta-blocker on discharge 5. 30-day mortality</td>
<td>1. Certified IM better [OR = 1.04 (1.01 – 1.07)] and cardiologist better [OR = 1.10 (1.05 – 1.15)] 2. Certified IM better [OR = 1.06 (1.02 – 1.10)] and cardiologist better [OR = 1.20 (1.13 – 1.26)] 3. Certified IM better [OR = 1.08 (1.06 – 1.11)] and cardiologist better [OR = 1.07 (1.03 – 1.10)] 4. Certified cardiologist better [OR = 1.20 (1.12 – 1.29)] 5. No difference</td>
<td></td>
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</table>

Note: No difference in all FM comparisons

<sup>a</sup>Results are based on certified vs. non-certified providers.
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>Turchin (2008)</td>
<td>Internal medicine (301 physicians)</td>
<td>Treatment of hypertension in diabetic patients</td>
<td>Recently certified, more likely to intensify therapy (23% reduction in drop in the probability of treatment intensification)</td>
</tr>
<tr>
<td>83</td>
<td>Curtis (2009)</td>
<td>Clinical cardiac electrophysiology, thoracic surgeons, other specialists (2,128 physicians)</td>
<td>1. Implantable defibrillators complication rates 2. Appropriate insertion of a defibrillator with cardiac resynchronization therapy</td>
<td>1. Certified better (1.3% to 5.8% higher depending on specialty) 2. Certified better (1.8% to 8.9% higher depending on specialty)</td>
</tr>
<tr>
<td>92</td>
<td>Holmboe (2010)</td>
<td>Internal medicine (236 physicians)</td>
<td>Composite measures for 7 chronic conditions, 4 acute care conditions, and 6 preventive services</td>
<td>Higher certification exam scores correlated with better performance on the overall (r = 0.19), chronic care (r = 0.14), and preventive services (r = 0.17) composites</td>
</tr>
<tr>
<td>67</td>
<td>Norcini (2010)</td>
<td>Cardiology, internal medicine, family medicine (6,113 physicians)</td>
<td>Mortality from congestive heart failure or acute myocardial infarction</td>
<td>Certification better (5.6% significant reduction)</td>
</tr>
<tr>
<td>93</td>
<td>Reid (2010)</td>
<td>23 specialties with direct patient care (10,408 physicians)</td>
<td>Overall performance scores from 124 quality measures from the RAND quality assurance toolkit</td>
<td>Certified better on overall performance measure (3.3 percentage points)</td>
</tr>
<tr>
<td>68</td>
<td>Weng (2010)</td>
<td>Internal medicine, endocrinology (957 physicians)</td>
<td>Diabetes composite measure: ten clinical measures and two patient survey measures</td>
<td>Certified endocrinologists in MOC better (standardized β = 0.30)</td>
</tr>
<tr>
<td>69</td>
<td>Hess (2011)</td>
<td>General internists, geriatricians, and endocrinologists (957 physicians)</td>
<td>Diabetes composite measure: ten clinical measures and two patient survey measures</td>
<td>Those not meeting minimum competence standard on composite performed worse on the IM certification exam (Cohen’s d = 49) and MOC exams (Cohen’s d = 0.78)</td>
</tr>
<tr>
<td>94</td>
<td>Hess (2012)</td>
<td>Internal medicine (676 physicians)</td>
<td>Diabetes composite measure: ten clinical measures and two patient survey measures</td>
<td>MOC exam and endocrine subscores significantly correlated (standardized β = 0.30)</td>
</tr>
<tr>
<td>95</td>
<td>Lipner (2013)</td>
<td>Cardiology, interventional cardiology, internal medicine (811 physicians)</td>
<td>Preventive cardiovascular disease composite measure; 8 clinical measures</td>
<td>Specialized cardiologists in MOC worse (standardized β = -0.14); Physicians providing preventive consultative care better (standardized β = 0.11)</td>
</tr>
</tbody>
</table>

*a*Indicates whether board certification or examination scores were significantly correlated with quality measures; correlated implies positively correlated. Statistics (eg, percentage point differences, correlations/regression coefficients, and confidence intervals) are provided to describe the magnitude of the relationship.

OR = odds ratio; IM = internal medicine; FM = family medicine; MOC = maintenance of certification.
Services Physician Quality Reporting System MOC Program Incentive. Physicians who successfully participate in reporting measures and are in MOC can receive an incentive payment of up to 1% of their estimated total allowed charges for covered Medicare Part B services.96

Second, we considered learning and improvement activities. Clearly self-assessment portions of the programs encourage physicians to examine medical knowledge and practice data, and we see some self-reported evidence of improvement in practice infrastructure, communication with patients and peers, and clinical care. Some studies support the notion of coaching or collaborations to help facilitate practice improvement although this kind of support is not currently integrated into the programs.31,42 Just such a program was authorized but not funded by the Affordable Care Act.97

Third, we addressed whether one’s certification status or exam performance is correlated with other nonclinical external measures of physician competence. We found substantial evidence, albeit with modest effect sizes, that many external measures (eg, types of training, practice characteristics, demographics, and malpractice/disciplinary actions) are significantly related to certification exam performance in the expected direction. Although reassuring, not all variance is explained by the measures.

Finally, we reported on studies examining whether certification is related to quality of patient care through performance on clinical process and outcome measures. There is more evidence, albeit with modest effect sizes, showing that physicians who are certified do generally provide better patient care. If certification is a marker of competence then this identifier is important for stakeholders to consider when choosing a physician. These studies are correlational in nature; we did not find any causal studies evaluating whether certification or MOC program activities cause physicians to provide better patient care.

This review has several limitations. First, we did not consider certification by other entities other than ABMS boards; these results may not generalize to other certification bodies. Second, we did not use a formal system to judge the quality of the methodology used in the studies. Third, a meta-analysis to compare effect sizes across different data types was not done; designs were extremely diverse, and it may not be possible with the information available.

The main goal of certification is physician accountability to the public. We have shown that a substantial body of evidence supports the value of certification and MOC in meeting that goal but the evidence is not unequivocal. In response, ABMS boards have begun to enhance their programs to be more authentic and relevant to practice while maintaining their rigor and continuing to study the program’s validity.98 The boards should continue to modify programs to address not only stakeholders’ concerns but also the forces driving change in the way physicians practice—including the systems in which they practice99—and the growth in the fields of measurement and technology. For example, quality measurement, particularly how quality measures are calculated routinely from electronic patient data, is maturing rapidly. The capability to do more accurate and practical measurement is growing. As the measurement science for performance in practice matures, there is keen interest to make this a routine, low-effort part of everyday practice and MOC. Keeping pace with these changes and doing so in a responsible and evidence-based way by considering scientific validity, acceptability, and technical and financial viability is important. Maintaining the privilege of self-regulation depends on advancing the transparency and effect of MOC. The ultimate goal for healthcare is to provide confidence in US medical practice, and produce a safer, more effective, more efficient, and more equitable health care system. Study designs that examine the causal effect of certification on patient care could help us better understand the programs’ value in improving health care and meeting this ultimate goal.

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**Lessons for Practice**

- ABMS boards should continue to modify programs to address not only stakeholders’ concerns but also the forces driving change in the way physicians practice—including the systems in which they practice—and the growth in the fields of measurement and technology.
- Competencies that are needed for future physicians should be periodically reexamined.
- Scientific validity, acceptability, and technical and financial viability should be considered in any approaches to assessment.
- In general, patients and hospitals value board certification; however, more work is needed to demonstrate to physicians that the effort involved in MOC yields improved patient care and professional satisfaction.
- Although control through randomization is difficult because of the voluntary nature of certification, studies examining the causal effect of MOC on patient care are important in order to gain a better understanding of the programs’ effectiveness and value in improving health care.


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63. Mehrtra A, Reid RO, Adams JL, Friedberg MW, McGlynn EA, Hussey PS. Physicians with the least experience have higher cost profiles than do physicians with the most experience. Health Aff (Millwood). 2012;31(11):2453–2463.


98. Lipner RS, Lucey CR. Putting the secure examination to the test. *JAMA*. 2010;304(12):1379–1380.

Foundations

The Royal College Experience and Plans for the Maintenance of Certification Program

CRAIG M. CAMPBELL, MD, FRCPC; JOHN PARBOOSINGH, MD, FRCPC

The Royal College of Physicians and Surgeons of Canada, in 2001, implemented a mandatory maintenance of certification (MOC) program that is required for fellows to maintain membership and fellowship. Participation in the MOC program is one of the recognized pathways approved by provincial medical regulatory authorities in Canada by which specialists can demonstrate their commitment to continued competent performance in practice. This article traces the historical beginnings of the MOC program, highlighting the educational foundation and scientific evidence that influenced its philosophy, goals, and strategic priorities. The MOC program has evolved into a complex system of continuing professional development to facilitate and enable a “cultural shift” in how we conceptualize and support the continuing professional development (CPD) of specialists. The MOC program is an educational strategy that supports a learning culture where specialists are able to design, implement and document their accomplishments from multiple learning activities to build evidence-informed practices. In the future, the MOC Program must evolve from assisting fellows to use effective educational resources “for credit” to enable fellows, leveraging a competency-based CPD model, to demonstrate their capacity to continuously improve practice. This will require innovative methods to capture learning and practice improvements in real time, integrate learning during the delivery of health care, expand automation of reporting strategies, and facilitate new sociocultural methods of emergent learning and practice change. Collectively, these directions will require a research agenda that will generate evidence for how transformative cultural change in continuing professional education of the profession can be realized.

Key Words: maintenance of certification/licensure, strategic issues in CME/CPD, philosophy, profession-physicians

Introduction

The Royal College of Physicians and Surgeons of Canada was created by a special act of the Canadian Parliament in June 1929, as a not-for-profit organization responsible for establishing the standards for specialty medical education in Canada. Today, the college establishes specialty training objectives, credentials residents, sets the standards and accredits all residency programs, and administers national certification examinations in 29 specialties, 35 subspecialties and 3 diploma programs.1

In 2000, the Royal College implemented a national system of continuing professional development (entitled the MOC Program) to support lifelong learning of Fellows, specialists certified by the College. Fellows must meet the requirements of the MOC Program to maintain their specialty certification and use the designation FRCSC/FRCPC. In this paper we provide a brief history of the rationale for educational philosophies guiding the development of a mandatory continuing professional development program of the Royal College. We will discuss the key factors that influenced the evolution of the MOC program since inception, identify some key differences between the MOC program and approaches to re-certification in the United States and highlight how the MOC program has been integrated within provincial revalidation strategies, an initiative of the Federation of Medical Regulatory Authorities of Canada. Finally, we will identify some of the key issues and challenges that are likely to influence future changes to the MOC Program as the Royal College implements a competency-based medical education model from residency until retirement.
A Historical Perspective

In 1975, a Royal College presidential committee influenced by the activities of the American Specialty Boards, recommended recertification by mandatory examinations as a desirable goal. The Royal College Council, as the policy-setting board and ultimate decision-making body, in voting against recertification, proposed instead that the Royal College work with national specialty societies to provide continuing medical education (CME) programs for specialists. Over the next decade, the Royal College focused its CME programs on assisting fellows to keep up with advances in clinical practice. This decision to reject the inclusion of mandatory recertification examinations as a desirable component within a national program of continuing professional development has repeatedly been supported by fellows, national specialty societies, and medical educators. Beyond concerns related to the limited capability of legally defensible examinations to assess the full range of competencies was the need to ensure the national continuing professional development (CPD) system promoted continuous learning in daily practice. This mandate required promoting participation in a range of learning activities designed to address identified practice needs including participation in rigorous assessment strategies that provided physicians with data and feedback about their knowledge, skills, or performance to inform future learning. The role of formative assessment was embraced as an essential component to the evolution of practice-based CPD in Canada. Over the next decade, significant initiatives included developing and enhancing access to established self-assessment programs, expanding the number and quality of CME programs, promoting the development of numerous awards and fellowships, and developing programs in peer review, medical audit and patient care appraisal.2

In 1986, fellows on the newly formed Communications Publications and Continuing Medical Education (CPCME) committee expressed the need for a system to help them with continued learning in the changing environment in which they practiced. Subspecialization, rapid expansion of knowledge and technologies, and increasing public expectations of specialty care created demands for specialists to seek effective methods of keeping up to date. The Council in 1988 passed a resolution that directed the Royal College to establish a system to facilitate the maintenance of competence of specialists. This led to initiation of the voluntary maintenance of competence (MOCOMP) program, which started as a pilot project in 1991 and became a formal program of the Royal College in 1994.3

The MOCOMP Program

The initial goals of the MOCOMP Program were to (a) set standards in continuing medical education, (b) encourage use of effective methods of CME, and (c) encourage use of innovative methods of CME.4 To accomplish these goals the MOCOMP program established an innovative framework and credit system to assist fellows with their continuing professional development (CPD).5 The program established a standard for self-directed continuing professional development,6 provided participants with an annual profile of their learning activities,7 offered a paper diary for fellows to record their self-directed learning based on questions raised in practice,8 and in 1997 created the Royal College Question Library, an anonymous, searchable database of questions recorded by fellows using PCDiary.9

Learning methods for CPD extended beyond traditional CME, which was perceived to be teacher driven and focused primarily on updating medical knowledge. In CPD, practitioners defined competencies that were deemed relevant to their personal practice needs. As well as traditional conference topics and themes, CPD education offerings cover subject matter such as doctor–patient communication, professionalism, interdisciplinary team skills and risk management, and medical ethics, as well as other competencies defined by the Royal College’s CanMEDS project, Skills for the New Millennium.10

The Educational Foundation of MOCOMP’s CPD Framework

MOCOMP’s CPD framework utilized a wide variety of education formats. The credit system encouraged fellows to select learning methods that research studies indicated resulted in behavior change and practice improvement.11–15 Fellows earned extra credits for recording practice-based learning projects, completing validated self-assessment programs and undertaking audits of their performance in practice. The educational infrastructure of the current MOC program was developed and piloted in MOCOMP over a period of 8 years. Supporting theories of adult learning16–17 and evidence from empirical studies of the impact of each method included in the framework on learning and change were explored prior to being piloted.18–20 Evaluation at this stage of MOCOMP focused more on feasibility and acceptability by fellows than on impact on practice.

Introduction of self-assessment programs and practice audits, although not a part of accredited CME at that time, required little defense as empirical studies had already demonstrated their effectiveness.21 However, the Council requested evidence in support of the stages of self-learning shown in FIGURE 1 that informed the structure of MOCOMP’s learning diary and its electronic version, PCDiary, which fellows used to record self-directed learning projects. From April 1994, when PCDiary was introduced, to June 1995, 123 fellows used the software to record 1431 items of self-directed learning. The recorded outcomes of these self-learning items
resulted in a commitment to change practice (43.7%), not to change practice (40.3%), or to seek further information (16.0%). Fellows who personally used self-directed learning and were aware of its absence in “for-credit” CME at this time, were regularly informed of the results of these studies through an internal Royal College Bulletin dedicated to MOCOMP.22 Slotnick, conducting a study on behalf of MOCOMP’s program planners in 1997, analyzed completed and failed episodes of learning using sequential prospective interviews with Fellows as they engaged in learning episodes.23 This work confirmed earlier observations that scanning (physicians’ search for new ideas, innovations or research findings potentially relevant to their practice) was often the first stage in self-learning. In a publication in 1999, Campbell and colleagues reported on the recorded stimulus for learning projects reported by physicians.24 One-third of the learning items submitted by fellows were stimulated by scanning the literature. In addition to scanning activities there were at least three other sources of information that initiated learning in practice. The first additional source was the identification of a potential problem described by Schön25 as a “practice surprise” that initiated a process he called “reflection-in-action.” Examples of practice surprises identified in Slotnick’s physician interviews included clinical or laboratory information that did not fit with the presumed diagnosis or a clinical course and that was not consistent with the physician’s previous experience. Reviews of current care practices and self-assessment programs were the second most common stimulus for learning projects reported by physicians. Results of these larger studies, which led to modifications in structure of PCDiary and later WebDiary used in the MOCOMP program, established the importance of practice related self-learning and the benefit and challenges related to the recording and reflection on learning activities stimulated by practice.26–28 Feedback from fellows participating in MOCOMP’s focus group meetings revealed that the learning diaries were used not only to keep records, but also as a learning guide for execution of personal learning projects.

Although many of the objectives planned for MOCOMP were achieved in its earlier years, when MOCOMP was discontinued in 1999 to make way for the mandatory program of maintenance of certification, only 30% of the fellows had registered and 13% received an annual profile. Less than 10% of fellows who registered in the MOCOMP program voluntarily used the paper or PCDiary.

Making the Case for a Mandatory CPD Program

Fellows, already over committed in their busy schedules, felt that external pressures or incentives were required for a national CPD program to achieve the goal of enhancing standards of practice. In establishing this mandatory education program for maintenance of certification the intent was to “promote a culture of continuous quality improvement and pursuit of excellence in specialty medicine.”26(p57) There was a growing realization by leaders in the Royal College and by some Fellows that the quality of specialty care was dependent in part on strategies that support and enable continued learning of specialists. The traditional model of CME, focused on dissemination of the latest medical knowledge, did not meet the needs of a physician’s practice which was more consistent with Sveiby’s concept of the “knowledge-rich workplace.”30 This, according to Sveiby, included 4 key features seen in most physician practices: nonstandardization, creativity, high dependence on individuals, and complex problem solving. The need for new learning skills in specialists led to the conclusion that, in the absence of a maintenance program, an initial certificate of competence loses its value to society over time. Indeed, a commitment to continuous learning was deemed to underpin physician’s professional values and to be integral to the profession’s evolving “social contract” with the public. In the college’s role as an advocate for high-quality specialty care, there was an explicit requirement for the profession to recognize the need for accountability and transparency for how fellows managed their lifelong learning in practice. In 1997, the Council established a task force to explore options for developing a mandatory program of continuing professional development that would achieve the goal of enhancing the quality of specialty practice. The task force’s report to the Council concluded that:

Whereas the Canadian public has a right to expect the highest standard of health care to be provide [sic] by competent specialists, every specialist has an ethical obligation to ensure maintenance of his/her competence by participating in a planned program of continuing professional development based on adult learning principles, and driven by rigorous evaluation of practice needs.”31(p129)
TABLE 1. The Royal College MOC Program Educational Principles (revised May 2011)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
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<tbody>
<tr>
<td>Personal</td>
<td>Each specialist is responsible to develop a personal continuing professional development plan that is relevant to their professional scope of practice.</td>
</tr>
<tr>
<td>Needs-based</td>
<td>Each specialist’s CPD plan should be based on their perceived and unperceived needs.</td>
</tr>
<tr>
<td>Choice</td>
<td>Specialists have the ability to choose learning activities that will address their identified professional practice needs.</td>
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<tr>
<td>Reflection</td>
<td>Specialists should critically think about and learn from their practice experiences.</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>Specialists are expected to continuously engage in learning activities that result in improvements to knowledge, competence, performance and health of patients.</td>
</tr>
<tr>
<td>Competency-based</td>
<td>Engagement in CPD activities and the outcomes achieved for practice should reflect and sustain the competencies required for practice.</td>
</tr>
<tr>
<td>Interprofessional</td>
<td>Learning with and from participation in interprofessional health teams, groups or communities of practice.</td>
</tr>
<tr>
<td>Evidence-informed</td>
<td>Specialist must base their decisions or conclusions on the best available evidence.</td>
</tr>
<tr>
<td>Systems-based</td>
<td>Participate in learning activities that enhance the quality and safety of the health systems within which physicians work.</td>
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The task force recommendations were in keeping with the views of many fellows. In 1997, 70.3% of 3655 fellows responding to a college survey agreed that the MOC program should be “a regular requirement to maintain their specialty certificate”. In 1999, a survey completed on behalf of the college determined that the public had a keen interest in how specialists “kept up-to-date.” Based on these collective initiatives and findings, the college formally changed its bylaws to require participation in a mandatory “maintenance of certification” to maintain membership and the use of the fellowship designation FRCPC or FRCSC.

The Maintenance of Certification Program

Since the implementation of the MOC program in 2001, the Royal College has sought to contribute to the evolving “cultural shift” in how we have conceptualized and supported the continuing professional development of physicians. The need for this cultural shift has been based in part on growing concerns regarding studies demonstrating persistent gaps in physician performance, adherence to health care quality indicators, and quality of care measures. The strategic directions for the MOC program have been informed by an expanding scientific evidence base on the role of learning on behavior change, performance improvement, and health outcomes. However, successes and challenges surrounding the design, implementation, renewal, and support of a comprehensive system of CPD for the Royal College have been informed by the following key components or factors.

1. Defining an Educational Philosophy, Principles, and Purpose for the MOC Program

Recognizing the roles and responsibilities of each provincial and territorial medical regulatory authority to regulate the profession and protect the public, the MOC program was designed as an educational strategy that would support fellows to embrace multiple learning methods and facilitate the ability to demonstrate their management of CPD throughout their professional practice. The MOC program was founded on the concept of continuing professional development to support learning across the CanMEDS competency framework and to value learning activities against each dimension of professional practice: clinical, administration, education, and research. The Royal College defined a number of educational principles that inform the current and future development of the MOC Program. The educational principles described in TABLE 1 provided fellows with the responsibility to design and implement a continuing professional development plan that was relevant to their scope of professional practice (personal, choice), responsive to their identified practice needs (reflection, needs based), and would sustain or enhance their competence, performance and health outcomes (continuous improvement, competency-based, evidence-informed). This approach to learning in practice valued both individual (personal) and group or team-based learning (interprofessional).

The purposes for the mandatory MOC program were to:

- Enhance and support lifelong learning and continuing professional development of Fellows to advance the quality of care provided to patients.
Facilitate the ability of Fellows to be transparent regarding how engagement in learning activities contributed to their knowledge, competence and performance, and enhance the health care provided by patients.

Provide evidence of participation in continuing professional development as a requirement for licensure, revalidation, and other privileges to practice.

There have been many challenges in ensuring a diverse membership with wide variation in practice contexts have an adequate understanding of the purpose and philosophy of the program. The limitations of electronic communications and use of Web sites were clearly identified in the first formal MOC program evaluation in 2008 where many criticisms and complaints were deemed to be based on an incomplete understanding of the foundational tenets of the program. There is a constant need for systems of CPD to be explicit about their underlying values, principles, and purposes.

TABLE 2. The Royal College MOC Program Framework

<table>
<thead>
<tr>
<th>Section 1</th>
<th>Section 2</th>
<th>Section 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group Learning</strong></td>
<td><strong>Self-Learning</strong></td>
<td><strong>Assessment</strong></td>
</tr>
<tr>
<td>Accredited Group Learning Examples include:</td>
<td>Planned Learning Examples include:</td>
<td>Knowledge Assessment Examples include:</td>
</tr>
<tr>
<td>• Conferences</td>
<td>• Personal learning projects</td>
<td>• Accredited simulation</td>
</tr>
<tr>
<td>• Rounds</td>
<td>• Traineeships</td>
<td>• Audit and feedback</td>
</tr>
<tr>
<td>• Journal clubs</td>
<td>• Fellowships</td>
<td>• Multisource feedback</td>
</tr>
<tr>
<td>Unaccredited Group Learning Examples include:</td>
<td>Scanning Examples include:</td>
<td>Performance Assessment Examples include:</td>
</tr>
<tr>
<td>• Courses or small group learning activities without industry funding</td>
<td>• Journal reading</td>
<td>• Direct observation</td>
</tr>
<tr>
<td>Systems Learning Examples include:</td>
<td>• InfoPOEMS</td>
<td></td>
</tr>
<tr>
<td>• Peer assessment</td>
<td>• Audiotapes</td>
<td></td>
</tr>
<tr>
<td>• CPG development</td>
<td>• Internet searches</td>
<td></td>
</tr>
<tr>
<td>• CQI initiatives</td>
<td>• Networking</td>
<td></td>
</tr>
<tr>
<td>• Curriculum development</td>
<td>• Direct observation</td>
<td></td>
</tr>
<tr>
<td>• Educational assessment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Creating a Comprehensive Framework of CPD Options

The original 6-section framework implemented in 2001 was changed in May 2011 to a 3-section framework to address concerns over the perceived complexity of the original framework. This new 3-section framework (see TABLE 2) was simplified to reflect common learning strategies used by physicians in practice: as a member of a group (Section 1); as an individual (Section 2); and based on completing an assessment of knowledge or performance (Section 3). In parallel, the feedback from specialists identified a need to expand the number and type of self-learning (including multiple approaches to scanning and engagement in enhancing the health system) as well as more assessment activities to more adequately reflect the value of these resources in contributing to their professional development. The new framework integrated credits for participating in learning activities, assessing one’s learning needs, identifying an impact for practice and finally assessing an impact on practice (see FIGURE 2). Participation in several self-learning activities (personal learning projects and traineeships and simulation programs) and all assessment activities were further incentivized in 2011 to receive higher credit ratings per hour based on their ability to identify and/or address practice-specific needs.40

In using this 3-section framework, all fellows are required to complete a minimum of 40 credits per year and 400 credits over each 5-year cycle. Satisfying the requirements of the MOC program is required to sustain membership, Fellowship and the continued use of the fellowship designation FR-CPC or FR-CSC.

Throughout the first 5-year cycle (2001–2005), despite concerns expressed by fellows that the greatest barriers to their participation in CPD were limited time for learning and the increasing demands of practice approximately 98% of fellows successfully completed the required minimum MOC cycle credits. The key factor in achieving this level of success was the decision to implement a national education support program that provided targeted support to individual physicians. This cycle completion rate remained consistent over the next 5 years. However, despite these initiatives, 664 fellows were removed from membership and fellowship for noncompliance with the MOC program between 2006 and 2012 (see FIGURE 3).

Annual participation rate in the MOC program by fellows practicing in Canada varied from 85% to 89% between 2001 and 2010. After implementing the revisions to the MOC program’s framework, credit system and MAINPORT (the
Royal College’s e-portfolio participation rates in 2011 and 2012 rose to over 90%, with participation in group learning activities exceeding self-learning and assessment activities (see FIGURE 4).

3. Development of a Multifunctional ePortfolio

Sutherland defined an ePortfolio as “a purposeful aggregation of digital items – ideas, evidence, reflections, feedback, etc., which ‘presents’ a selected audience with evidence of a person’s learning and/or ability.” The Royal College development of PCDiary, based on Schön’s model of practice reflection was originally designed to encourage Fellows to “consciously reflect on their practice experiences, identify items of learning they perceived had expanded or consolidated their expertise and plan their professional development.”

Over the past 15 years, ePortfolios have been viewed as important tools in facilitating and supporting lifelong learning in multiple health professions across the medical education continuum. The Royal College’s e-portfolio, MAINPORT, has evolved from a platform to document participation in learning activities into a learning tool to facilitate the ability of physicians to capture and store evidence of participation in and outcomes from engagement in continuing professional development. In addition, MAINPORT supports and promotes practice reflection, facilitates planning, setting, and tracking of progress in achieving established learning goals, and supports the giving and receiving of feedback. Collectively, these purposes create a foundation for physicians to manage their continuing professional development in practice. The core functionality and design features for MAINPORT have been described elsewhere and the design principles for MAINPORT are summarized in TABLE 3. Access to MAINPORT has been supported through the development of real-time access from multiple platforms including mobile devices.

The recording of participation in learning activities and the need to reflect on and identify outcomes of learning for credit was a new expectation of physicians in practice. As the tools to support learning in practice evolved, the college was challenged to develop a more robust education support strategy.

4. Implementing a Central and Regional Educational Support Program

The design and implementation of a complex continuing professional development program requires thoughtful consideration regarding how learners will be supported in understanding and using the program as designed. The Royal College created a centralized educational support unit, now called the Royal College Services Center (RCSC), accessible through a toll-free number, e-mail, or fax to provide fellows with answers to specific questions about their learning activities, provide explanations about policies or cycle dates as well as serving as first line technical support for members. The RCSC was active throughout the year by providing personal support activities.
TABLE 3. ePortfolio Design Principles

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-driven</td>
<td>The learner is responsible for the content of the e-portfolio</td>
</tr>
<tr>
<td>User-friendly</td>
<td>An interface that is intuitive to promote ease of use</td>
</tr>
<tr>
<td>Flexibility</td>
<td>The ability of learners to personalize access to tools, resources, or programs</td>
</tr>
<tr>
<td>Interoperability</td>
<td>To facilitate automation of data transfer from multiple sources</td>
</tr>
<tr>
<td>Ease of access</td>
<td>Real-time access from multiple platforms including mobile devices</td>
</tr>
<tr>
<td>Security</td>
<td>Ensuring confidence in the privacy of the data</td>
</tr>
<tr>
<td>Personal growth</td>
<td>The ability to reflect a “story of learning” and growth in “expertise” over time</td>
</tr>
</tbody>
</table>

help and assistance to 21,773 fellows and other MOC program participants during 2012.

In 2011, a regional education support strategy was launched to respond to the needs of fellows identified in a MOC program evaluation survey completed in 2008. A cohort of CPD educators, practicing in each region of Canada were recruited and actively supported by the Royal College to enable them to provide local or regional educational sessions, webinars, as well as individual mentoring. Throughout 2011–2012 these CPD educators provided educational sessions across Canada attended by over 3000 fellows. Guided by regional needs assessments the CPD educators serve important roles in assisting fellows to use the MOC program to address their professional practice needs and to teach the skills of lifelong learning.

5. Development of a Royal College CPD Accreditation System

The inclusion of group learning and various assessment activities within the MOC Program’s framework required the Royal College, in partnership with the National Specialty Societies and University offices of CME, to establish a CPD provider accreditation system that was formalized in 2004. Participation of national specialty societies and other national CPD organizations in the CPD accreditation system was entirely voluntary. The merits for the development of a CPD accreditation system focused on provider organizations were recently described by Kopelow. Subsequently, in 2009, the Royal College approved a second set of accreditation standards for simulation programs to promote engagement in this form of assessment by fellows.

The development of a rigorous CPD accreditation system challenged the college to create a collaborative and supportive support strategy for CPD provider organizations who voluntarily participated in the accreditation process as a reflection of their commitment to support physician learning and contribute to the evolution of the accreditation standards over time.

The foundation of a CPD accreditation system enabled the Royal College to achieve substantive equivalency agreements with the ACCME (2008), the American Medical Association (2010), and the European Union of Medical Specialists (2011). These equivalency agreements provided the basis for how the Royal College recognizes international learning activities and has facilitated the exchange of credits from one system to another.

6. Promoting the Development of a CPD Research and Development Strategy

The Center for Learning in Practice was created in 2004 to provide the Royal College with an educational research and development strategy for lifelong learning in practice. Since inception the Center for Learning in Practice has been involved in the development of CPD research activities, including systematic reviews of empirical studies that contributed to the development of a lifelong learning curriculum for residents and specialists in practice. implemented a series of webinars to support educational research across Canada and designed and implemented a microsite within the Royal College portal that provides a host of resources and support tools for medical education in Canada.

The Center for Learning in Practice has led the development of a rigorous MOC program evaluation strategy, providing important evidence on the program’s ability to meet its intended goals, ensuring regular feedback to program leaders and fostering a culture of continuous improvement and promoting an organizational commitment to change. The first major review of the MOC program occurred in 2008–2009. Approximately 3000 fellows completed an electronic or paper survey, providing quantitative and qualitative data on Fellows’ perceptions, experiences and recommendations for the future development of the MOC program. Some key findings were that motivation to participate in the MOC program was driven primarily by internal factors such as remaining “up-to-date” and engagement in CPD was viewed as a personal professional responsibility, rather than driven by regulatory requirements or peer pressure. These findings supported the educational philosophy of the MOC program and reflected the importance fellows place on lifelong learning as members of a knowledge intensive self-regulated profession. Attending conferences and courses, “learning when caring...
Physician revalidation, developed by the Federation of Medical Regulatory Authorities of Canada for implementation within each province and territory is the last stimulus for the creation of an assessment strategy within the MOC program. Physician revalidation is defined as:

...a quality assurance process in which members of a provincial/territorial medical regulatory authority are required to provide satisfactory evidence of their commitment to continued competence in their practice.

The purpose of physician revalidation is to “reaffirm, in a framework of professional accountability, that physicians’ competence and performance are maintained in accordance with professional standards.” The demonstration of ongoing competence and performance of physicians, through engaging in continuing professional development programs or systems committed to these values and principles, is a pillar of professional self-regulation. The position statement resulting from this definition and purpose requires that

All licensed physicians in Canada must participate in a recognized revalidation process in which they demonstrate their commitment to continued competent performance in a framework that is fair, relevant, inclusive, transferable, and formative.

The recognition of the MOC program as an acceptable CPD system for the purposes of revalidation established the link between participation in CPD and licensure renewal. However, the role of CPD within physician revalidation will challenge the Royal College to demonstrate how participation in the MOC program is maintaining and enhancing competence, performance, and patients’ health outcomes.

Evolution of the Royal College’s MOC Program: A Vision for the Future

Since the implementation of the mandatory MOC Program, there has been significant progress in the Royal College’s commitment to reflect the rapidly expanding CPD research literature and facilitate a learning culture where specialists are able to design, implement, and document their accomplishments from multiple learning activities to build evidence-informed practices. However, the cultural shift in CPD remains incomplete. In this final section, we discuss 4 future directions for the evolution of the MOC program.

In the future, the goal of the Royal College’s MOC Program must evolve from assisting Fellows to use effective educational resources “for credit” to requiring fellows, enabled by a competency-based CPD model to demonstrate their capacity to continuously improve practice. Progress towards this goal will be enabled when learning in practice is reflective of the breadth of competencies embedded within the CanMEDS competency framework which will undergo its next major transformation by 2015. However, there is an additional need, anchored within the scholarly role of the CanMEDS framework to ensure that residents and fellows in practice have acquired a set of competencies that enable them to systematically manage their learning for practice improvement. These “lifelong learning” competencies include the ability to (a) use practice information to identify learning priorities and to develop and monitor CPD plans; (b) access information sources for innovations in development and new evidence that may potentially be integrated into practice; (c) establish a personal knowledge management system, for instance, using an e-Portfolio; store and retrieve evidence and select and manage learning projects; (d) construct questions, search for evidence, and record and track conclusions for practice; and (e) use tools and processes

1. Clarify the philosophy and reduce the complexity of the MOC program.
2. Simplify the documentation of activities and outcomes in MAINPORT.
3. Create a regional continuing professional development support network.
4. Revise the MOC Program credit system.
5. Expand assessment strategies within MOC program.

These recommendations resulted in changes to the MOC program framework, credit system, and MAINPORT implemented in May 2011. The next phase of program evaluation was initiated in October 2012, included a survey, completed by over 5,000 fellows and several planned focus groups which will occur throughout 2013 to evaluate current areas of strengths and weaknesses and suggested recommendations for future program enhancements.
to measure competence and performance and develop action plans to enhance practice. It is likely that future CPD program for MOC will be structured to capture how Fellows use the CanMEDS competency framework to demonstrate continuous improvement across their scope of practice.

In addition to influencing the learning capacities of fellows, content experts, already working to achieve competency-based residency education for residents, will be required to define for their specialty a set of measurable milestones that practicing specialists can use to measure their progress from being competent at the time of certification to achieving mastery and expertise through their practice experiences. Two major shifts currently occurring in the Canadian health care environment, namely, delivery of specialty services by interprofessional health teams and the introduction of new types of interprofessional education resources may actually facilitate rather than hinder the introduction of competency-based CPD.

Health care organizations now actively encourage practitioners to work in interprofessional health care teams as studies indicate that care provided by teams result in better patient outcomes and working in teams facilitates the adoption of practice guidelines. The right local context, including practitioner beliefs, values and practice norms and leadership, can enhance practitioner engagement in team-based activities and foster a culture of continuous practice improvement among care team members. While fellows should not automatically assume they are the leaders in interprofessional health care teams, they may earn the position through acquisition of community facilitation skills and, applying CANMEDS’s competencies, take a leadership role in facilitating team development and creating a culture of continuous improvement among team members. We contend that future MOC program should, in addition to requiring fellows to demonstrate capacity to continuously improve practice, acknowledge and reward fellows for learning as members of interprofessional care teams, assess their collective team performance, and earn leadership roles in multidisciplinary care teams.

Researchers in workplace learning make the case for the establishment of a new type of education resource, based on sociocultural education methods to help physicians and other members of the multidisciplinary care team to engage in practice improvement initiatives. Researchers in knowledge translation increasingly support sociocultural methods of emergent learning and change in practice. For instance, Greenhalgh and Wieringa recommend that medicine and health care should exploit “social ways, in which knowledge emerges, circulates and gets applied in practice.” This new approach is not just a new type of formal education session. Practitioners working in clinical communities of practice build trusting relationships and are encouraged to talk informally about work issues and participate formally at team-based meetings where they exchange experiences and share visions of how practice can be improved using facilitated structural dialogue. There is increasing recognition of the potential contribution of “structured talk” to effective learning. Research suggests that structured dialogue creates new insights and understanding and, ultimately, leads to commitment to change practice among participants. Abbey argues for structured dialogue to be perceived as an “emerging pedagogy.” As accredited CME begins to focus on care teams, as predicted by Olson, there will be a need to consider how to teach and support the skills of structured dialogue, community facilitation skills (using networking and team member interactivity as key interventions in assisting practitioners to adopt a new practice) and how to run “Practice Talk” meetings. In the future, given the recent gained technical capabilities of MAINPORT to import data from a multiple of external sources, the ability to capture elements from a Fellow’s participation at the clinic’s weekly “Practice Talk” meeting in his or her MAINPORT account will provide important evidence for learning in practice.

Finally, it is likely that the shift in the MOC program to demonstrating meaningful participation in practice improvement will require more active engagement and involvement of fellows. We predict, based on recent feedback from fellows, that acceptance and ownership of MOC would increase dramatically if the program actually helped Fellows to provide better care and not just requested a collection of activities, credits or points each year. Existing college resources (such as the CanMEDS clinician educators and CPD educators) could be charged with exploring how participation in practice improvement could be demonstrated by capturing performance data in real time (perhaps through the use of electronic health records) and thereby reduce to a minimum the need for Fellows to meet deadlines each year for submission of CPD activities as currently happens. Triangulation of narrative, qualitative data with quantitative data on practice improvement collected for MOC would not only enhance the richness of information on fellows’ contribution to practice improvement and team activities but would also, we contend, improve fellows’ perceptions of the college’s MOC program.

Eva and Regher suggest that interaction with practice mentors provides the most effective method of feedback on performance for residents and, they suggest, this observation could be modified to apply to practitioners participating in the MOC program. This program will be collecting information about physician improvement activities from program directors and appointed group facilitators in clinics and hospital departments. We speculate that facilitators of interprofessional clinical groups, using data digitally collected real time from regularly scheduled
practice improvement meetings, could provide meaningful information for MOC on the practice improvement and team-based activities of fellows.

These future directions must be supported by further evolution of the CPD framework and credit system. Today, physicians who provide peer review or serve as practice mentors can claim credits for their participation in these activities under Section 2: Systems Learning. But the current framework and credit system remains inadequate in its ability to reflect an appropriate balance between individual learning and learning embedded within teams or groups. The evolution of new models of learning in practice will challenge the MOC program to provide strategies, systems, and tools to support and enable these learning activities and provide greater automation to support the recording of these activities within an expanded ePortfolio.

**Conclusion**

Over the past 2 decades, the Royal College of Physicians and Surgeons of Canada has implemented and refined an evidence-informed system of continuing professional development to support, enhance and promote physician learning in practice. Although the MOC program has developed a number of innovative educational strategies and technological tools to support learning in practice, physicians continue to view the recording and submission of learning activities for credit as tedious and time consuming. Although there is a commitment to continue to refine and enhance the relevance of the MOC program, the current barriers to change will challenge the Royal College to seek ways to enable fellows to demonstrate their capacity to continuously improve practice. This strategic direction will require new innovative methods to capture learning and practice improvements in real time, integrating learning from the delivery of health care by interprofessional health teams, expanding automation of reporting strategies, and facilitating new sociocultural methods of emergent learning and practice change. Assessment must become embedded within workflow and facilitated by effective feedback to facilitate the identification and response to areas where improvement is required.

Collectively, these directions will require the development of a research agenda that could include the following research questions:

- Which existing MOC activities enhance the confidence of the public and regulatory bodies in the profession’s ability to sustain their competence throughout their practice life cycle?
- How will the implementation of a competency-based CPD model facilitate learning, behavior change, and improved patient outcomes?
- What role do specific continuing professional development activities play in maintaining or enhancing competence, performance and improvements to the quality and safety of the health system?
- What strategies will be effective in promoting physicians to assume ownership of the improvement process and thereby contribute to a culture of continuous improvement?
- How can technologies be used to capture learning and practice improvement of individual physicians or physicians as members of interprofessional clinical teams?
- How will providing performance data with feedback by peers, mentors, or coaches contribute to continuous learning in practice?
- What skills and competencies are required to support physician’s ability to plan, manage, reflect, and record their continuing professional development over time?
- What strategies will be effective in promoting the development of learning within communities of practice?
- The development of a research agenda will remain a critical component to generating evidence for how transformative cultural change in continuing professional education of the profession can be realized.

**Lessons for Practice**

The design, development and implementation of mandatory CPD systems are supported or enabled by:

- A clear articulation of the program’s underlying philosophy, goals and educational principles.
- The development of a comprehensive educational support strategy.
- Technological tools that assist learners to plan and manage learning in practice.
- A comprehensive approach to program evaluation.
- Commitment to innovation, collaboration, and scholarship.
- Continually responding to advances in educational methods and changes in the health care environment.

**Acknowledgments**

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References


Foundations

The United Kingdom’s Experience With and Future Plans for Revalidation

JULIAN ARCHER, MD, PHD, MRCPCH, MED, FAcadMED; SAM REGAN DE BERE, PHD

Assuring fitness to practice for doctors internationally is increasingly complex. In the United Kingdom, the General Medical Council (GMC) has recently launched revalidation, which has been designed to bring all doctors into a governed environment. Since December 2012, all doctors who wish to practice are required to submit and reflect on supporting documentation against a framework of best practice, Good Medical Practice. These documents are brought together in an annual appraisal. Evidence of practice includes clinical governance activities such as significant events, complaints and audits, continuing professional development and feedback from colleagues and patients. Revalidation has been designed to support professionalism and identify early doctors in difficulty to support their remediation and so assure patient safety. The appraiser decides annually if the doctor has met the standard which is shared with the most senior doctor in the area, the responsible officer (RO). The RO’s role is to make a recommendation for revalidation every 5 years for each doctor to the GMC. Revalidation is unique in that it is national, compulsory, involves all doctors regardless of position or training, and is linked to the potentially performance moderating process of appraisal. However, it has a long and troubled history that is shaped by high-profile medical scandals and delays from the profession, the GMC, and the government. Revalidation has been complicated further by rhetoric around patient care and driving up standards but at the same time identifying poor performance. The GMC have responded by commissioning a national evaluation which is currently under development.

Key Words: maintenance of certification/licensure, physician assessment/remediation, problem/dyscompetent physicians, professionalism/ethics, profession-physicians

Background

Revalidation is the process by which all doctors now are required to demonstrate to the General Medical Council (GMC) in the United Kingdom that they are up to date and fit to practice.1 This paper provides an overview of the UK experience of this regulatory development. We use a broad comparative international framework to explain differences in approaches to ensuring physician fitness-to-practice in terms of health care system organization and politics.

Revalidation started in England in December 20122 as a 5-year cycle in which doctors must demonstrate that they should be allowed to retain their license and therefore practice. Revalidation uses the outputs from the National Health Service (NHS) annual appraisal process that gives doctors an opportunity to formally discuss their professional roles and clinical practice.3 Annual appraisal is conducted by a senior doctor usually within the same organization, not necessarily in the same specialty, and at each appraisal a portfolio of supporting information is provided by the doctor to demonstrate a high standard of practice in relation to 4 areas set out by the GMC3: (1) knowledge, skills, and performance; (2) safety and quality; (3) communication, partnership, and teamwork; and (4) maintaining trust.

At appraisal, all practicing doctors must demonstrate that they have collected and reflected on 6 areas of supporting documentation providing evidence of performance in these 4 areas of practice and as outlined in the GMC guidance Supporting Information for Appraisal and Revalidation. A summary showing the supporting documentation mapped to the appraisal portfolio is provided in TABLE 1.

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### TABLE 1. Supporting Documentation Mapped Against the Appraisal Portfolio Within Revalidation

<table>
<thead>
<tr>
<th>Appraisal Portfolio Heading</th>
<th>Details</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal details</td>
<td>General information which contextualizes individual practice</td>
<td>• Organizations and locations where practice has taken place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Details of current and proposed practice</td>
</tr>
<tr>
<td>Scope of work</td>
<td>• Knowledge, skills and performance</td>
<td>• Continuing professional development (tailored to the specific needs</td>
</tr>
<tr>
<td></td>
<td>• Safety and quality</td>
<td>and interests of the individual and their practice)</td>
</tr>
<tr>
<td></td>
<td>• Communication, partnership and teamwork</td>
<td>• Quality improvement activity including individual, organizational</td>
</tr>
<tr>
<td></td>
<td>• Maintaining trust</td>
<td>and national audit</td>
</tr>
<tr>
<td>Record of annual appraisals</td>
<td>Documentation from previous annual appraisals</td>
<td>• Significant events (unintended or unexpected event, which could or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>did lead to harm of one or more patients). Case review or discussion</td>
</tr>
<tr>
<td>Personal development plans</td>
<td>A personal development plan (PDP) including review of any previous PDPs</td>
<td>• Feedback from colleagues</td>
</tr>
<tr>
<td>and their review</td>
<td></td>
<td>• Feedback from patients</td>
</tr>
<tr>
<td>Probit</td>
<td>Demonstrating honesty and trustworthy and acting with integrity as mapped out in <em>Good Medical Practice</em></td>
<td>• Review of complaints and compliments</td>
</tr>
<tr>
<td>Health</td>
<td>Declaration of acceptance of professional obligations in <em>Good Medical Practice</em></td>
<td>• Summary form signed by appraiser from previous appraisals</td>
</tr>
<tr>
<td></td>
<td>about personal health</td>
<td>• Authored evidenced PDP with reflection on previous PDPs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Signed statement of declaration of probity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Requirement to inform the GMC if cautioned, charged with or found guilty of a criminal offence or suspended from a medical post or have restrictions placed on practice</td>
</tr>
</tbody>
</table>

Continuing professional development (CPD) schemes, in line with most international schemes, are delivered in part by Royal Colleges, the United Kingdom’s specialist professional bodies. Feedback from colleagues and patients is collected using multisource feedback (MSF) approaches. Various tools have been developed by Royal Colleges, academics, private companies, and the GMC themselves. But while there is no expectation that any specific instrument must be used, in England at least, the GMC has invested significantly in developing and validating their instruments and have issued guidance about best practice. Additionally, individual doctors are expected to keep a reflective log of significant incidents and complaints. Early indications show that appraisers most value CPD and audits/informal data review when evaluating doctors’ practice at appraisal.

At the end of the 5-year period a recommendation is made to the GMC for revalidation by a responsible officer (RO) who, for most physicians working in the NHS, is the medical director of their primary care or hospital trust. ROs are required to review the annual process including a short report provided by the appraiser. ROs can make one of three decisions: to recommend revalidation, to defer the decision (due, for example, to not enough evidence resulting from a career break), or recommend a referral to the fitness-to-practice procedures at the GMC. The GMC has final responsibility for making the decision about a doctor’s revalidation, based on this recommendation. Where there are relatively minor concerns about a doctor’s performance there will be a process of local support and remediation through the employer. Those who are not will be referred to either the National Clinical Assessment Service (NCAS) or the GMC’s “fitness to practice” procedures. Doctors can also be referred to the GMC by patients, colleagues, and managers outside of the normal revalidation process.
A Unique Scheme

Revalidation shares common goals with many initiatives in other developed countries seeking to improve patient care through the ongoing review of individual medical practice. It is, however, a uniquely national solution, informed both by the structure of health care provision in the United Kingdom and the historical authority of the separate medical institutions. Unlike federal nations with differences across state boundaries, the devolved nations of the United Kingdom (England, Scotland, Wales, and North Ireland) are shaping some of what happens in each nation but ultimately doctors are licensed (and therefore relicensed/revalidated) by one UK-wide regulatory body: the GMC.

In addition to its centralized management, revalidation is also politically and philosophically distinct to other systems. It has not been presented as a system developed by doctors for doctors, such as MOC programs, for example, in the United States, but as a centralized system that utilizes employer–employee relations to ensure accountability. While decisions are made nationally, initial decisions are processed locally through the RO—a senior doctor often in the employing organization. Ideologically, it has been sold to the UK profession as a response to agendas around improving patient safety and patient care, rather than a way of facilitating professional development for its own sake.

Importantly, and directly related to the patient safety agenda, revalidation is compulsory for all doctors who wish to practice in the United Kingdom. This differs from schemes in the United States, for example, where officially schemes are voluntary, although it should be noted that increasing pressure on US physicians to seek certification and later recertification resulted in 87% of physicians in the United States being certified by 2006. Motives are different, however; for example, in the United States, the growing consumer movement in health care and managed care plans favor board-certified physicians for their networks. So the United States characteristically has relied on market forces to bring about professional change, whereas in the United Kingdom this has been linked rhetorically at least to patient care.

A further distinction is that revalidation is compulsory for all doctors in training, in public or private practice, and whether permanent or visiting the United Kingdom. Therefore, it has important implications for medical education, education design, and development. It is one scheme that focuses on generic, rather than specialty, skills—another emphasis that distinguishes it from other systems of certification. This generic approach has been shaped by existing structures in the United Kingdom where a single body, the GMC, is responsible for all medical regulation. The Royal Colleges have been involved in revalidation’s development, and are part of developing and delivering CPD, but ultimately revalidation is about licensure and fitness to practice as a “generic” doctor, and not specifically, for example, as an orthopedic surgeon. The medical Royal Colleges are professional bodies who lead on professional development and representation. This regulatory structure is in contrast to some schemes, such as New Zealand’s “vocational scope” and “general scope” recertification programs. Vocational scope recertification is for doctors who are registered specialists including GPs. “General scope recertification” provides for nonspecialist doctors who are not in formal specialist training, including new registrants, such as international medical graduates, regardless of seniority, who must work under supervision for at least their first 12 months in New Zealand to become familiar with the culture.

Revalidation draws on CPD points—50 “points” annually (1 point generally equates to 1 hour), as is common with most schemes, but additionally requires doctors to provide data such as compliments, complaints, audit data, colleague and patient feedback (again see TABLE 1). Other than a voluntary scheme run by the Society for Cardiothoracic Surgery (STCS) in Great Britain and Ireland, there is no knowledge test.

Uniquely, revalidation asks all doctors to bring together their annual documentation in a reflective piece facilitated by an appraiser. Appraisers therefore now have a dual role. They continue their role as facilitator in terms of exploring with the doctor what they have achieved, what they want to achieve and how that doctor might go about it, but they also now have the role of reporting to the RO a doctor’s satisfactory performance (or otherwise) to inform revalidation recommendations. However, concerns have been raised about the standardization of appraisal, consistency of RO decisions, and the lack of plans for dealing with doctors whose practice gives cause for concern.

A Troubled History

Revalidation represents the first significant challenge to a system of medical self-regulation that was established with the 1858 Medical Act. It testifies to a lack of fit between a system of regulation focused on individual conduct and the modern practice of medicine, which is “dominated by complex structural issues.” Its development as a regulatory system has been shaped by a number of key events, providing a useful discussion of the contingent factors that have led to the erosion of a collegial system through new forms of managerial control. As part of the aforementioned neoliberal agenda, there have been perhaps three main drives toward regulatory changes in the United Kingdom. First, there has been liberalization of the markets in health care and increasing pressures on public services; second, there has been general erosion of trust in professional expertise; and, finally, there have been a series of serious medical malpractice cases, followed by high profile public inquiries.
Developing a process for ongoing review of UK doctors in the workplace was originally placed on the agenda by the Merrison Committee in 1972, which was set up to modernize medical regulation by the government of the day. Merrison recommended that “the GMC mount a study of the desirability of an annually issued practice certificate on the lines of that required by solicitors. The chief point of such a scheme would lie in requiring doctors to make a declaration of their continued fitness to practise.” In May 1998, the GMC published a new edition of Good Medical Practice, a statement of generic medical standards which formed the foundation of quality assured practice, explicitly linking standards with registration. It is from this point that the debate began in earnest within the profession; while externally a spate of high profile medical malpractice incidents, serious enough to prompt Government inquiries, placed regulation firmly on the political agenda. These incidents included poor clinical performance and accountability at the Bristol Royal Infirmary (1996–1998); negligent practice by Rodney Ledward, consultant gynecologist; and, most significantly, the conviction of Harold Shipman, a trusted and popular GP, for the murder of 15 patients.

Importantly, these cases not only identified poor individual practice but also shed light on a professional culture that was perceived as lacking accountability. The media were quick to blame the ineffectiveness of the GMC as a regulator, while the author of the Shipman Inquiry, Dame Janet Smith, vilified the GMC for trying to link revalidation to NHS annual appraisal.

As a direct outcome of the Shipman Inquiry, Sir Liam Donaldson, then chief medical officer of England, undertook a broad review of medical regulation that articulated the 3 key aims of revalidation—relicensing, recertification, and remediation—and set out a plan for its implementation. In response, the GMC produced a series of consultation papers entitled “Revalidation: The Way Ahead.” These documents set out a process of enhanced standardized appraisal with CPD and colleague and patient feedback at its heart augmented by clinical governance data such as audit and critical case reviews.

In early 2009, the GMC had set up the UK Revalidation Program Board to give strategic leadership of the roll out of revalidation. The first pilots across 10 areas in England with 3000 doctors taking part were announced by the Secretary of State in January 2010, the purpose of the pilots being to test the components of revalidation. Despite an evaluation establishing that over 80% of the organizations and over 70% of the ROs expected any full revalidation rollout to lead to improvements in patient safety, quality of care, and patient experience, central government delayed full implementation for a further year over concerns of readiness. Revalidation was formally launched on December 3, 2012, a full 10 years after the GMC was empowered to introduce it through the Medical Act Amendment Order 2002.

Commentators from both within the profession and without acknowledge that the proposed changes to medical regulation divided the profession and placed considerable strain on the historical relationship of trust between the government and the profession. The rhetoric of both parties places the patient at the center of their argument. However, the debates that have informed revalidation’s history to date have been primarily professional ones about policy, professional governance, and leadership.

Where Next?

As a response to the burdensome history of regulation in the United Kingdom, the GMC has taken a proactive stance on revalidation and are planning to commission a national evaluation of its impact. The GMC visualize revalidation as a regulatory “lever” for change and hopes to find that its implementation is shaping health care provision through developing and supporting appraisal and enhancing clinical governance. Research to develop an evaluative framework is underway, led by the authors of this article, and will be reported toward the end of 2013. It is envisaged that the arising evaluative framework will then be implemented from 2014.

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Lessons for Practice

- Regulators are required to highlight and minimize poor practice to keep patients safe.
- However, most regulators also wish to drive up clinical standards through educational programs.
- Efforts to develop dual programs, attempting to achieve both aims, may be at risk of unhelpfully increasing complexity and in terms of assessment methodologies require different approaches.
- Like all complex interventions, regulatory processes can have unintended as well as intended consequences, and therefore they should be evaluated to assess their impact.
- Central to policy success is likely to be when regulatory systems focus—and are seen to focus—on patients.
Conclusions
Medical regulation, and particularly maintenance of certification programs, is becoming increasingly complex across the world. Revalidation in the United Kingdom is part of this complexity. Regulators are attempting to highlight poor practice to keep patients safe but also to drive up clinical standards through educational programs. Achieving dual programs such as this while being fair to doctors and, most important, while making sure patients are the focus is far from easy.

Revalidation offers a comprehensive strategy to achieve such ends. With robust evaluation, we may begin to understand the processes and consequences of this national program of compulsory maintenance of certification and assess its impact in practice.

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Foundations

Practicing Physicians’ Needs for Assessment and Feedback as Part of Professional Development

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Recently, more is being learned about the linkages among assessment, feedback, and continued learning and professional development. The purpose of this article is to explore these linkages and to understand how assessment and feedback can guide professional development and related practice change. It includes a brief review of conceptual models that guide learning and practice change in general, related to both formally structured continuing professional development (CPD) sessions and to self-directed individual activities, and draws on these to inform learning and change from assessment and feedback. However, evidence and theory show that using assessment and feedback for learning and change are not naturally intuitive activities. We propose a 4-phase facilitated reflective process for enabling engagement with assessment data and feedback and using it for learning and change, and explore the varied personal and contextual factors which are influential and require consideration. We end with practical implications and suggestions.

Key Words: maintenance of certification/licensure, multisource feedback/peer assessment, physician assessment/remediation, reflective practice

While self-regulation is a long-standing tenet of the medical profession, in recent years it has increasingly been a topic of debate both professionally and publicly. The profession has responded by putting in place programs and requirements (maintenance of certification or revalidation programs) to ensure that physicians maintain and enhance their individual competence and thereby ensure safe and appropriate care for the public. Participating in lifelong learning and professional development is a critical component of such initiatives.

Currently, our understandings of physician professional development are in transition. While traditionally viewed rather narrowly as continuing medical education (CME), a generally didactic and clinically oriented activity, it is now viewed more broadly as continuing professional development (CPD). CPD encompasses multiple educational and developmental activities which physicians undertake to maintain and enhance their knowledge, skills, performance and relationships in the provision of health care.1–4 In this way, CPD addresses physicians’ multiple domains of competency—for example, medical expertise, communication with patients, collaboration with the health care team, resource management—and the various roles that they may pursue as educators, researchers, administrators, and others. The ultimate goal of CPD is to enhance the quality and safety of patient care and to enhance health outcomes.

CPD can take place in traditional formal programs like lectures and workshops and in more informal and self-directed ways such as learning in practice from patients and critical incidents; in discussion with colleagues and coworkers; and, through reflection upon practice, relationships, professionalism and learning needs. It can also occur through a formal external performance or practice assessment such as chart audit, multisource feedback, peer practice visit, or patient satisfaction surveys. Physicians can also conduct these practice assessments on their own to learn about their performance.

As we learn more about the linkages among assessment, feedback, and continued learning and professional development, two themes are emerging. The first is the notion of assessment for learning, not just of learning, that is, using assessment data to guide learning and practice change.5 The
second is the realization that learning occurs within the context of one’s practice, through the everyday contact with patients and colleagues and exploring the questions which arise in clinical practice. Such workplace or practice learning has not always been recognized as “learning”; the traditional view was that physicians needed to leave their practice to attend a lecture or workshop in another location, to learn. The purpose of this article is to explore linkages and to understand how assessment and feedback can guide professional development in its varied forms and related practice change. We will begin with a brief review of the conceptual models that guide learning and practice change in general, and more specifically learning and change from assessment and feedback. We will then explore in depth a phased process for learning from assessment and feedback, and the factors that can enable this process and those which can get in the way. We will end with practical implications and suggestions for moving ahead.

Models of CPD

CPD arises from and follows varied paths, and is both self- and other-directed. The stimuli to participate in CPD are both internally and externally motivated. Internal motivation can arise through a general recognition of the need to remain current and to be able to serve one’s patients as optimally as possible. It can also arise informally in daily practice through access to external data, which leads a physician to realize that their knowledge or practice may not be as current as it should be in a particular area, for example, through a patient’s question that they’re unable to answer, recognizing that their colleagues are managing a particular problem differently than they are, or through their own questions that arise from practice. Health care organizations, institutions, and policy makers can act as explicit external motivators for CPD by providing data on patient care and outcomes that identify gaps in practice locally, regionally, or nationally. External motivation can also arise through the provision of formal individual performance assessment data.

The response to such performance data may be to participate in a formal CPD program, to learn and to potentially improve one’s practice. It may also be to undertake self-directed learning activities. In 1989, Fox, Mazmanian, and Putnam published an extensive and pivotal study of how physicians learned and changed in practice. The study demonstrated that physicians participated in extensive, iterative and largely self-directed processes to identify and respond to gaps in practice, an important model of learning and change has since been further evolved and adapted. Self-directed learning (SDL) is recognized as a critical component of CPD, to the extent that medical professional and regulatory associations acknowledge documented self-directed learning, reflection, and change activities arising from practice as accredited CPD activities.

Self-directed learning is a process in which individuals take the initiative, with or without help from others, to undertake 5 cognitive activities: diagnosing their learning needs, formulating goals, identifying resources, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. While the activities comprising SDL may be described in slightly varying terms, an essential conceptual framework incorporates two elements: the cognitive skills as described by Knowles, and an attitude; i.e., a state of mind, a curiosity or willingness to self-direct one’s learning. The willingness to self-direct one’s learning is central to lifelong learning and effective CPD. Integral also is the notion that physicians have the ability to identify the need for learning and also for practice improvement and to respond to this need. Such activities often require some degree of CPD, whether more formal learning about a specific topic, or learning about and implementing system improvements. The field of knowledge translation further informs the process by stressing the need to adapt the knowledge and learning to the local context, assess barriers and tailor interventions.

Process of Using Assessment and Feedback for CPD

CPD should be grounded in and guided by the work that physicians do, that is, by their daily practice. A basic premise of this assumption is that assessment and feedback data arising from performance and practice be readily accessible to the physician, to use in a formative assessment process for CPD and practice improvement. The data can be made available and collected in various formal and informal ways. Formally, in the United States, health systems such as Kaiser Permanante, institutions such as Mayo Clinic, and health insurers provide data on a regular basis to their physicians. Furthermore, some groups, such as the American College of Cardiology and the Society for Thoracic Surgery, provide registries for use by institutions to monitor and improve care by physicians. In Canada, the provincial medical regulatory authorities through mandated peer review activities increasingly require the provision of formal performance assessment data to individual physicians with the intent of practice improvement. Professional organizations require for maintenance of certification that physicians report in prescribed formats the collection and response to learning and/or practice data. Physicians can also collect practice and assessment data to inform themselves of how they are doing and to guide learning and practice improvement.

Consciously collecting and using external practice and performance assessment data to inform CPD and
improvement needs is a requisite step. Relying on unguided self-assessment alone; that is, a global assessment of how one is doing without drawing on appropriate external data, is unreliable. Unguided self-assessment correlates poorly with external assessment and this is most marked in those with lower performance who frequently consider themselves as above average. Hence, physicians, as do most people, require external data and feedback to inform their performance self-assessment to provide a more realistic view of how they’re doing. Good self-directed learners actively seek out external data to calibrate their own assessments of how they’re doing. Nicol and McFarlane-Dick suggest that self-directed learners make better use of external feedback, and that the development of self-regulation skills needs to exist as a complement to external feedback. They propose a facilitated model for formative assessment which supports use of external feedback, comparison of it with one’s self-assessment through reflection, and then making an action plan.

A Process for Learning From Assessment and Feedback Data

While it may be expected that physicians will actively seek out performance data on their own to guide their CPD, and respond positively to feedback provided through formal performance assessment, such is not always the case. Performance data are often not easy to acquire on one’s own, and even when one does, or when one receives formal performance feedback, the path to using it may not always be clear. If such feedback is perceived as disconfirming or disappointing, it may evoke an emotional reaction that can interfere with the ability to assimilate and learn from it, or there may be lack of clarity about how to best use it.

The literatures on self-directed learning, performance assessment, and informed self-assessment identify activities that are integral to using assessment data and feedback for continued learning and the challenges inherent in completing these activities. Particularly useful is the iterative self-directed learning cycle proposed by Knowles and the evidence outlining the process of and factors that influence the accessing and responding to external data to inform one’s self-assessment. From these is proposed a 4-step process for enabling the use of assessment and feedback for CPD: (1) accessing and receiving the data, (2) engaging with the data, (3) using the data to plan and implement a response, and (4) measuring the outcome of that response. The following sections address each of these steps and include challenges related to accomplishing each and suggested interventions. The process and steps are summarized in Table 1, including the factors influencing each step (potential barriers) and suggested educational or translational interventions. Appendix 1 provides a case scenario as an example of using the process.

1. Accessing and Receiving Data and Feedback

Physicians can receive and access their own practice and workplace data from multiple sources for assessment and feedback purposes. The sources can be formal such as those required by regulatory authorities and professional bodies. In Canada, the medical regulatory associations (i.e., the provincial Colleges of Physicians and Surgeons) are moving to conduct formal assessment and feedback processes, for example, the Physician Achievement Review multisource feedback (MSF) program of Alberta, Nova Scotia, and, most recently, Manitoba, and the Peer Assessment Program of Ontario. An intended purpose, beyond fulfilling regulatory requirements and protecting the public, is to provide performance data to physicians that they can use to improve their practice. In the United Kingdom, the General Medical Council requires for revalidation that physicians maintain a portfolio of data collected via various formal sources, for example, MSF, patient questionnaires, practice audit, significant event analysis, and so on. The intent is that they will formally use this data to guide their CPD (Also see Archer, this issue, for an in depth discussion of UK practice) Similarly, in the United States, the American Board of Medical Specialties and its member organizations are specifying formal performance assessment activities to meet regulatory requirements and contribute to competence, continued learning, and practice improvement.

The most common formal ways of collecting assessment data about how physicians are doing in practice include chart audit, multisource feedback questionnaires, peer office visits and inspections, significant event analysis, patient questionnaires, and practice and population health process and outcomes data, as commonly available through US health care organizations and professional bodies. These are generally externally mandated assessment processes, in which the data are made available to the physician for the purpose of letting them know how they’re doing and informing their CPD and improvement.

In contrast to externally mandated assessment, physicians can and should be self-seekers of pertinent data that informs them about their performance and opportunities for learning and improvement. They can do this using the approaches identified above; physicians can undertake such assessments themselves or as a practice group or health care team and use the data for improvement. But physicians also acquire assessment and feedback data daily in informal ways from multiple sources, for example, from patients, colleagues, coworkers, educational events, students, and residents. The internal self is also a source of assessment data, for example, being mindful and aware when one is feeling anxious or uncertain.

In summary, consciously accessing and receiving data from external sources is central to physicians’ assessment, as
### TABLE 1. A Process of Using Assessment Data and Feedback for Learning and Performance Change

<table>
<thead>
<tr>
<th>Activity or step</th>
<th>Factors Influencing this Activity/Potential Barriers</th>
<th>Interventions/Enablers (educational and translational)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Accessing data and feedback</td>
<td>• Ready access to practice and performance data • Ability to collect own data; eg, conduct chart audits, patient questionnaires • Time to conduct these activities</td>
<td>• Systems to support easy data access; eg, appropriately configured electronic medical record, admin support to conduct patient surveys • CPD to enhance data collection skills; eg, in chart audit</td>
</tr>
<tr>
<td>2. Engaging with the data and feedback</td>
<td>• Nature of the feedback (confirming or disconfirming) • Self-efficacy • Ability to interpret the data • Workplace context and culture</td>
<td>• Facilitated reflection upon the feedback and what it means • Facilitated discussion of the opportunities created by the feedback</td>
</tr>
<tr>
<td>3. Using the data and feedback for learning and change</td>
<td>• Ability to identify measurable and realistic goals • Ability to create and implement an action plan • Inclusion in the plan of specific contextual and personal factors which will influence its success</td>
<td>• Coaching in identifying learning opportunities, developing goals, planning and considering influential factors • Development of a written action plan</td>
</tr>
<tr>
<td>4. Measuring outcomes and evaluating learning and change</td>
<td>• Ready access to practice and performance data • Ability to collect own data; eg, conduct chart audits, patient questionnaires • Ability to interpret the data</td>
<td>• Systems to support easy data access; eg, electronic medical record, admin support to conduct patient surveys • CPD to enhance skills in data collection and change measurement; eg, in chart audit</td>
</tr>
</tbody>
</table>

Individual global self-assessments that are not consciously informed by external data are unreliable. An array of data sources is available. However, the paths to accessing those data are not always easy—the data may not be readily accessible or provided in a user-friendly format, time is often a barrier to acquiring or accessing performance data, and electronic health records that are not configured to enable easy data access and report generation are a barrier.

### 2. Engaging With the Data and Feedback—Reflection and Interpretation

Research has shown that engaging with data and feedback is distinct from receiving or accessing that data and feedback. Engagement may in fact not necessarily follow, especially if the feedback disconfirms perceptions of one’s self.27,22,34 Engaging with the feedback means giving it serious consideration, reflecting upon how it pertains to one’s performance and practice, interpreting it, and considering how to accept and respond to it. Feedback is context-specific for each physician, and engagement involves exploring the data and what it means within the individual practice context.35

A reluctance to engage with feedback data can arise for several reasons. The first relates to the nature of the feedback, whether it confirms or disconfirms one’s practice. When we receive performance feedback, an almost automatic and even unconscious first response is to compare it with how we see our own performance, that is, with our own self-assessment.30 If the feedback is surprising and especially if it disconfirms one’s own views, there may be difficulty in engaging with it. The initial response may be to question the data and its credibility, to become defensive, to believe that it doesn’t pertain for one reason or another. Disconfirming performance data can elicit an emotional response such as anger, denial, sadness or disappointment and can actually lead to demotivation and poorer performance rather than improvement.27,37

Even if disconfirming feedback is received and accepted, other personal factors may influence one’s ability to engage with and use it. One of these is low self-efficacy, the belief that one is not able to accomplish the change or activity indicated by the data. For example, physicians receiving MSF data that indicated a need for improvement in their patient communication skills reported that they did not believe that they could change their communication style.24
reason for not using the data is not knowing how to interpret and actually make use of the data, not knowing how to put it into practice. For example, physicians receiving comprehensive audit data indicating a need for better management of their diabetic patients may not know how to translate that into an action plan.38 Knowing that one should change, but not believing that one can change or knows how to change, can be frustrating and actually result in decreased motivation to engage with the data.

In summary, engaging with performance data, especially when the data disconfirm one’s own self-perceptions, can be difficult and various factors legitimately contribute to the lack of engagement. However, this creates a dilemma, as it is feedback that presents an alternate view of their performance which physicians most need to consider, understand and respond to. Research now demonstrates that facilitating reflection upon the feedback can in fact enhance physicians’ engagement and insight into its relevance and credibility.39,25,40,41 Facilitated reflective discussions guided by another person (a peer, mentor, supervisor) can foster feedback reconciliation with one’s own self-assessment and lead to engagement and acceptance.36,42,34 A second important task of the feedback discussion is to enable the physician to see the opportunities presented by the feedback for him/her for improved patient care and outcomes. Facilitating interpretation of the data and a vision of how they might use it in the context of their own practice can enable the physician to take on the feedback and develop a route to improvement and change.

3. Using Data and Feedback—for Learning and Change

Seeing the opportunities presented by the feedback enables physicians to plan and use it as a guide for CPD and implement practice change, for example, in managing hypertension and weight gain in their diabetic patients. The data provide a window of opportunity, a stimulus, to guide these activities. CPD activities vary and may involve attendance in structured learning and skill-building sessions, or may be planning and implementing self-directed learning as in reviewing the literature around the issue that has arisen and documenting the learning arising from it, or organizing a clinical preceptorship.

However, the opportunities offered by the feedback and defining the path to achieving them may not always be clear, and barriers may exist to achieving them.26,38 In these situations another facilitation approach, coaching, may prove effective.43,44 Coaching for development, like teaching and mentoring, supports personal and professional development but differs from teaching and mentoring in approach. While teaching and mentoring are more instruction and directive, coaching is facilitative and guides the recipient in identifying their own needs and goals and in developing a realistic plan.

Coaching:

Focuses on the future and the creation of the highest potential self. It relies on the creativity and resourcefulness of individuals to generate their own intention and solutions, with the coach supplying nonjudgmental, inquiry-based approaches and principles.43,44

Coaches may be peer or supervisor physicians who have received specific training in being coaches. Coaching activities include reviewing the feedback data with the physician and engaging them in a conversation about those which are most meaningful to them and which they see as providing the most compelling opportunity for enhancing their practice and patient outcomes. The coaching conversation then moves to guiding the physician to set specific and realistic goal(s) and to developing a plan for attaining the goals. Planning involves paying special consideration to the factors which may both impede and enable progress and success, setting timelines, and considering how success will be measured.45

It can often be helpful for the physician to write a brief, structured, practical plan for change using a change template or a commitment to change format which incorporates the planned change and also the factors which enable or get in the way of change.46,47 Helping physicians realize that just “working harder” or “doing more” is often not the best approach to making sustainable practice change, is also an important facilitation message. We now know from studies of behavior change and knowledge translation that many factors influence the ability to change. British psychologists through extensive research have identified 14 domains which can influence the likelihood of behavior change.48,49 In addition to knowledge and skills, these include social/professional role and identity, beliefs about capabilities, optimism, beliefs about consequences, reinforcement, intentions, goals, memory and decision processes, environmental context and resources, social influences, emotion, and behavioral regulation.48 Through awareness of these domains, the coach can facilitate the physician in exploring specific factors which may be most influential for the change being considered, and in developing an action plan which specifically addresses them. An important function of the coach or facilitator is to also aid the physician in identifying resources they can draw upon or approaches they might use; in other words, to help them think differently about how they might accomplish their goal. Examples might include using their receptionist in a different role, collaborating with a colleague to tackle a change, engaging patients.

In summary, the assessment and feedback data offer opportunities for development and practice change. However these opportunities and the way to achieve them may not always be evident, and providing coaching strategies to enable
4. Measuring Outcomes and Evaluating Learning and Change

Evaluating the outcomes of one’s learning or change strategies is a basic tenet of both CPD and self-directed learning; however, it may be the one to which the least attention is paid. Professional and regulatory associations in Canada, the United States, and the United Kingdom are now moving toward more strongly fostering strategies for evaluation of learning and change. The Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada promote recording of the results of one’s self-directed learning initiatives and the American Board of Medical Specialties encourages demonstration of use of best practice data for improvement. In the United Kingdom, the National Health Service Annual Appraisal process facilitates individuals to develop an ongoing plan for CPD and guides toward their 5-year revalidation.

The challenges to collecting the evaluation data are similar to the challenges physicians’ experience in accessing and compiling performance data, whether it be practice data collected through chart audit, institutional data reporting on patient outcomes, patient survey data, or MSF, for example. Electronic medical records which can produce practice reports on patient care processes and outcomes could enable evaluation of outcomes. Processes for collecting and compiling survey data in a busy practice are also required. Most physicians still don’t have these capacities, and for assessment feedback to be taken seriously so that outcomes can be measured, they are required.

Summary

Ideally, physicians should have ready access to and be able to use their performance data to guide their CPD and ongoing practice improvement, and ultimately enhance patient care and outcomes. We are now developing a clearer understanding of the activities and intricacies involved in the process. The proposed four-phase process (accessing the data, engaging with it, using it to implement a response, measuring the outcome of that response) may enable both greater understanding and support for physicians as they aim to use their feedback data. We can also appreciate that the reality for many physicians may be that the process of accessing and using performance data is currently not straightforward and potential barriers exist at each phase. As noted in this article, multiple factors influence the process from accessing and receiving the data, through engaging with and accepting the data, using the data to guide and implement learning and change plans, and evaluating the outcomes of these initiatives. Factors that can influence each of these processes include the ease of data access and interpretation, the nature of the feedback, emotional reactions to it, one’s self-efficacy, motivation, and goals; personal relationships and the practice context and culture; resources; the availability of a coach or mentor to facilitate the detangling of these multiple influences; and the developing of realistic and useful plans.

Recommendations for moving ahead include encouraging CPD professionals and others to consider their role as facilitating each of the four steps for using feedback data for learning and improvement, and to test out this role. The overarching role of the CPD professional may no longer be primarily to plan and provide formal CPD programming and content, but to facilitate the process by which physicians can readily access performance and practice data, engage with it, use it for developing and implementing learning and change plans, and evaluate the outcomes.

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Appendix 1: Case Scenario in Applying the Proposed Process for Using One’s Assessment Data and Feedback for Learning and Performance Change

Note about the case: While the physician is fictitious, the details of his performance review and feedback are real and are a compilation from multiple discussions with physicians about their MSF reports.

Accessing Data and Feedback

Dr. Black is a 57-year-old primary care physician who has just received his multisource feedback (MSF) performance review report, administered by his health care organization. This is the first time he’s been involved in an MSF assessment. The MSF collects data by questionnaire from patients, colleagues, coworkers, and self-assessment, and the numerical results are compiled into tables in a hard-copy report which is sent to the participating physician. The report includes a few guidelines for interpretation. Dr. Black finds the report long and a bit difficult to interpret. As he goes through the report, he sees—to his surprise—that his patients have scored him much lower than expected on the items for communication with patients. He feels devastated by this—he has been in practice for 30 years and has always thought that he got along with his patients very well. He always chats with them about the latest sports events and movies and tells jokes and cajoles them.
• Barriers to Dr. Black’s accessing his data: difficulty in understanding the report, negative emotional reactions to low scores, disappointment;
• Enablers/interventions: potentially speaking with a spouse or a colleague.

**Engaging With the Data and Feedback**

Dr. Black becomes depressed by this information and wonders even if maybe it’s time to leave medicine. He believes that one is “born with” the ability to communicate, and communication skills are not something that one can change—there’s nothing he can do about it. This is very discouraging. It’s also frustrating to see a problem pointed out and realize you can’t do anything about it. However, he learns that his health care organization offers a facilitated feedback and coaching session for physicians wanting to explore their MSF scores further. He decides he can’t lose anything by asking for an appointment; at least he can vent his frustration about the inadequacies of the performance appraisal process and MSF in particular. To his surprise, as he talks with the facilitator and shares his dismay at these results and his frustration about not being able to do anything, he finds that the facilitator understands his perspectives and confirms that he is not alone—others feel this way, too. The facilitator also provides some hope by describing the progress in the field of communication skills since Dr. Black went to medical school, and the research that shows that communication skills can be learned and changed. In fact, they are now an integral component of most medical school and residency curricula.

• Barriers to Dr. Black’s engaging with his data: negative emotional reactions to low scores, belief that he could not change (low self-efficacy); feeling discouraged and frustrated;
• Enablers/interventions: reflective discussion with a facilitator who understands and confirms that he is not alone, that his beliefs about not being able to change communication skills are false, and that there is hope for change.

**Using the Data and Feedback for Learning and Change**

The facilitator reviews with Dr. Black the items in his MSF report pertaining to communication skills. He asks Dr. Black to reflect on how he interacts with patients and these results, and based on this, what would make him feel better about his communication with his patients? What would be his goals? What would he like to change? Dr. Black talks about several specific items from the report and identifies changes he’d like to make; for example, in response to a low score on “explaining treatment plans and drugs,” one goal would be for patients to tell him that he explains things more clearly. He identifies several specific goals. The facilitator then asks him to think about a plan to achieve these goals—what does he need to do, and what resources does he need to succeed? What might get in the way of success? Dr. Black identifies that he first needs to learn about appropriate communication skills and doesn’t know how to do this. The facilitator shares resources, including the undergraduate and family medicine postgraduate communication skills curricula at the local medical school, as well as several websites addressing communication skills. Dr. Black then identifies that he needs to be able to practice his new skills, and that lack of confidence in his ability to change might be a barrier. The facilitator shares an interactive communication skills website which allows participants to practice, and contact information with the medical school communication skills program that provides an annual workshop for physicians. Dr. Black sets a time line for learning and beginning to try out these new skills with his patients and improve over the next 3–6 months.

• Barriers to Dr. Black’s being able to use the data for change: Need to learn new communication skills, availability of learning resources, lack of confidence
• Interventions/enablers: Conversation with a facilitator/coach who can help him to identify the opportunities for change, identifying specific and achievable goals, developing an action plan, considering barriers

**Measuring Outcomes and Evaluating Learning and Change**

The facilitator asks Dr. Black how he might plan to assess whether or not his goals have been met. He responds that he will ask patients if he is addressing their concerns and explaining things clearly, for example. He’s also considering using a patient experience questionnaire that the facilitator had mentioned, at the end of the year.

• Barriers to measuring outcomes: Ability to identify specific, measurable outcomes; ability to administer, collect, and analyze own data as required for a patient satisfaction questionnaire; ability to use these data
• Interventions/enablers: Access to a standardized questionnaire for follow-up; resources for survey administration and analysis; support from a facilitator or other resource person

**References**


Maintenance of Certification, Revalidation, and Professional Self-Regulation

ERIC S. HOLMBOE, MD

In this special supplement, authors from Canada, the United Kingdom, and the United States discuss the rationale and current evidence behind programs designed to concomitantly help physicians demonstrate and improve individual competence while improving care for the patients and public they serve. Programs in all three countries, labeled as either maintenance of certification (MOC, Canada and the United States) or revalidation (United Kingdom), are grounded to a large but variable extent in the principles of professional self-regulation. In all 3 countries, the notion of professional self-regulation is under increasing scrutiny by policy makers and the public as the result of high-profile scandals involving physicians and concerns about slow progress in improving quality and safety of care.1–9 Despite these concerns, professional self-regulation is still seen as vital, but with the public and medical leaders calling for better oversight and assessment of physicians longitudinally over a career.1–3,10–11

MOC and revalidation have been primarily developed and implemented by members of the medical profession to provide a meaningful and impactful approach to physician assessment and continuous professional development in response to these latest public and professional concerns. The Royal Colleges in Canada and in the United Kingdom and the certification boards in the United States are independent, nongovernmental entities. The certification boards in the United States also do not have members; all US-certified physicians are considered “diplomates” of their respective boards. Before further exploring the role of MOC and revalidation in professional self-regulation, a brief review of what defines a profession will help place MOC and revalidation in its proper societal context.

For our purposes, the following definition of a profession is useful:

Profession: An occupation whose core element is work based upon the mastery of a complex body of knowledge and skills. It is a vocation in which knowledge of some department of science or learning or the practice of an art founded upon it is used in the service of others. Its members are governed by codes of ethics and profess a commitment to competence, integrity and morality, altruism, and the promotion of the public good within their domain. These commitments form the basis of a social contract between a profession and society, which in return grants the profession a monopoly over the use of its knowledge base, the right to considerable autonomy in practice and the privilege of self-regulation. Professions and their members are accountable to those served and to society.12

While one might legitimately dispute with certain aspects of this definition in today’s health care environment (eg, “monopoly” and “autonomy”), a key principle in this definition is the commitment to competence, a commitment grounded in a social contract between the profession and society. The need for professional self-regulation arose mostly because the members of a profession possess a set of comprehensive and complex competencies, and thus the profession is often seen to be in the best position to “judge” the competence and performance of its members. The theory of the social contract, which has strongly influenced the development of medical ethics, holds that physicians’ moral and social obligations depend on an implicit contract (or agreement) between themselves and the society that they serve.13 In exchange for highly specialized services that require complex competencies attained only through extensive training, society grants physicians special privileges as long as they...
meet their professional obligations. The phrase “special obligations to all my fellow human beings” from the modern version of the Hippocratic Oath is a central tenet of the social contract.14

The social contract for the medical profession is also highly dependent on the individual and collective competency of professionalism. Professional self-regulation is a privilege and not a right – the right to self-regulate has to be continuously earned. While the concepts of modern medical professionalism are continually evolving (and should), the most widely cited modern medical “code” is the Charter on Medical Professionalism that targets 3 primary principles and 10 commitments physicians must make to patients and society15 (see EXHIBIT 1).

Many of the commitments, such as competence, honesty and confidentiality, speak directly to the obligations of the physician to each and every patient under their care as well as the public. Professional competence has recently received greater and more focused attention with the worldwide movement toward competency-based medical education and professional development.16–17 While there are legitimate criticisms directed at the competency-based training paradigm,17–18 the focus on linking professional development with health care outcomes for the benefit of patients and society is worthy of attention as part of the MOC and revalidation programs. Patients should rightly expect that a physician who provides certain healthcare services within their scope of practice will embrace the opportunity to demonstrate and improve their competence through assessment and performance measurement. This is especially pertinent given the data showing that competence and performance can decline over time and that self-assessment in isolation without external input and data is ineffective.19–21 Assessment by others, especially patients, and self-directed assessment using validated methods and tools is a professional obligation.15

Another important commitment in the Physician Charter is improving quality of care. Quality and safety problems have plagued many health care systems, highlighted by the Institute of Medicine’s seminal reports on health care in the United States, To Err Is Human and Crossing the Quality Chasm, but improving quality and safety is a worldwide concern.22–24 What are physicians’ obligations to improve the quality of care? Personal competence in quality, safety, and systems science is now a critical need for the practicing physician. The Accreditation Council for Graduate Medical Education/American Board of Medical Specialties deliberately created the practice-based learning and improvement and systems-based practice competencies to explicitly call out the need for physicians to embrace the knowledge, skills, and attitudes necessary for quality improvement and patient safety.25 Assessments targeting these competencies are now included as core components in the US MOC and UK revalidation programs. These assessments also rest on strong theoretical foundations and empiric evidence.26 Multiple studies have highlighted substantial deficiencies in physician training and continuing professional development programs in these particular competencies.23–24,27 Admittedly, the science regarding the measurement of these competencies is in its early phases, but the need to incorporate such measurement into practice for the benefit of and by patients and the public is clear.25,28

MOC and revalidation provide a meaningful and increasingly valid mechanism for the medical profession to continually earn and maintain the privilege of self-regulation. The programs highlighted in this supplement, especially in the United States and the United Kingdom at the current time, provide multiple methods and tools for assessment and feedback for individual and groups of physicians to examine the quality of the care they provide and then use that data to improve care for the benefit of their patients.26,29–31 Programs from all 3 countries also provide multiple mechanisms to help physicians identify and correct gaps in knowledge and clinical reasoning. Physicians who embrace and meaningfully participate in MOC and revalidation help to demonstrate that professional self-regulation is not only still viable but, more important, can be a potent force for public good.3,32

While beyond the scope of this supplement, a brief mention of the US Federation of State Medical Boards (FSMB) development plans for a maintenance of licensure (MOL) program is warranted to avoid confusion. The MOL program is a legislatively created requirement determined on a state-by-state basis.33 MOC, in contrast to MOL, is a national,

**EXHIBIT 1. Principles and Commitments of the Physician Charter**

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<th>Fundamental Principles:</th>
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<td>Principle of primacy of patient welfare</td>
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<td>Principle of social justice</td>
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<th>Professional Commitments to:</th>
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<td>Professional competence</td>
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<td>Honesty with patients</td>
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<td>Patient confidentiality</td>
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<td>Maintaining appropriate relations with patients</td>
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<td>Improving quality of care</td>
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<td>Improving access to care</td>
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<td>A just distribution of finite resources</td>
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<td>Scientific knowledge</td>
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<tr>
<td>Maintaining trust by managing conflicts of interest</td>
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<td>Professional responsibilities</td>
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14 Holmboe
voluntary professional self-regulatory program independent of licensure in the United States. The FSMB has signaled that MOC can be used to meet future MOL requirements, but MOC itself will not be a requirement for maintaining a license in the United States.33

Are the current MOC and revalidation programs perfect? No, not at this time, and legitimate criticism has been leveled at the MOC programs in the United States.34–35 Examples of specific concerns include insufficient evidence on the effectiveness of these programs to improve patient outcomes and on the return on investment for participating physicians, and incomplete alignment of assessments across specialty boards in the United States. All programs are in a state of ongoing development and improvement, not only at the national level but also within the multiple specialty disciplines within each nation. Furthermore, MOC and revalidation alone will not solve all the health care challenges facing each country. All entities administering programs designed to improve quality recognize the need for ongoing refinement and improvement.

Yet, leveraging physician professionalism through MOC and revalidation can be a powerful force in improving health care. The article by Lipner and colleagues in this supplement provide current evidence on the validity of the assessments used in US MOC programs, and the article by Hawkins and colleagues highlight the strength of the underlying assessment methods and theory that help to advance the potential of self-regulatory MOC and revalidation assessment programs.26,29 This potential has been recognized by the Center for Medicaid and Medicare Services (CMS) in the United States with the proposed approval of some MOC activities for credit in the Physician Quality Reporting System (PQRS).36

What are the obligations of the entities that oversee MOC and revalidation? Simply put, to ensure the programs provide value and impact for the physicians who participate and for the public they serve. As Dale Dauphinee noted in his plea of the need for professional self-regulation, ensuring and demonstrating the validity of these programs should always be an ongoing and interactive process.3 What, then, are the obligations of the physicians enrolled in MOC and revalidation? Participants must engage the process seriously to improve both their own competence and patient care but also to provide meaningful feedback to continually improve these assessment programs. Paraphrasing Iglehart and Baron from their commentary on MOC, “A choice facing the medical profession is not between the elimination of MOC and a return to less fettered self-regulation, but rather another potential fork in the road...however, the ABMS and its boards must actively (and transparently) respond to the MOC concerns of all physicians, young and old alike, and accelerate its collaborative efforts with external organizations...” 35 The medical professional and its professional organizations must collaboratively act to maximize the potential of professional self-regulation through MOC and revalidation to improve health and healthcare – the public wants and expects nothing less. I hope the articles in this supplement will catalyze further conversation and research to ensure the medical profession can earn and maintain the privilege of professional self-regulation worldwide for the public good.

References
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