The impact of web-based educational modules to fulfill Part IV of maintenance of certification: an effort to improve the performance of individual physicians

Zisblatt, Lara Jo
Boston University

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Boston University
THE IMPACT OF WEB-BASED EDUCATIONAL MODULES TO FULFILL PART IV OF MAINTENANCE OF CERTIFICATION: AN EFFORT TO IMPROVE THE PERFORMANCE OF INDIVIDUAL PHYSICIANS

by

LARA JO ZISBLATT
B.S., Boston University, 2000
M.A., Boston University, 2007

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Approved by

First Reader
Alan K. Gaynor, Ph.D.
Associate Professor Emeritus, Educational Leadership and Policy Studies

Second Reader
Mary H. Shaner, Ph.D.
Professor of Educational Leadership and Policy Studies

Third Reader
Nancy L. Davis, Ph.D.
Director of Practice Based Learning and Improvement
Association of American Medical Colleges

Fourth Reader
Curtis A. Olson, Ph.D.
Assistant Professor of Medicine
Dartmouth College, Geisel School of Medicine
Dedication

I would like to dedicate this dissertation to my husband, Ryan Sasaki. Your support and pride in my work has meant so much to me and has helped me throughout this process.

Thank you to my son, Dresden Sasaki, for being such a good sleeper, which gave me the energy to do this. I cannot wait to spend all the time I have been spending on this dissertation with you. And thank you to my fuzzy son, Emmett Jo Zisblatt, for snuggling when I needed it the most. Thank you to my family, particularly my mom, Suzanne Zisblatt, and my sister, Rebecca Sanford, who both encouraged me to keep going. Mom, I am now your daughter the doctor!
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LARA JO ZISBLATT

Boston University School of Education, 2014

Major Professor: Alan K. Gaynor, Ph.D., Associate Professor of Educational Leadership and Policy Studies

ABSTRACT

Background: The American Board of Medical Specialties (ABMS) developed a requirement that uses the process of board certification to have physicians complete improvement cycles to help them increase their compliance with basic standards of practice. To meet this requirement, called Part IV Practice Performance Assessment, some organizations have developed self-directed, web-based modules that bring providers through each stage of improvement. The purpose of this study is to determine the impact of these web-based Part IV modules, to see what, if any, improvements they effect in practice, and to see if they encourage participants to engage in practices that are proven to bolster and sustain improvement.

Methods: There are two parts to this study. In the first part, the data from three web-based Part IV modules were analyzed using a matched-pair t-test to compare baseline and follow-up data collected as part of the modules. In the second part of the study, a focused ethnography was used to investigate the views of physicians about this new requirement.
Participant views were collected through a semi-structured interview process and data were analyzed through thematic analysis.

**Results:** Data were analyzed for 770 clinicians who participated in one of three web-based Part IV modules. Participants demonstrated significant improvements in 27 of 31 measures assessed through the modules. Thirty-two physicians who participated in one of three modules were interviewed. Data from the interviews show that while a majority of physicians did not want to participate in such modules, some found value in participating and improved their practice. Some used quality improvement strategies and made improvements that impacted their performance and the performance of other physicians in their practice. Others focused on their own practice and worked to change habits. Some participants reported no change in practice and considered participation a waste of time.

**Conclusions:** The data from the modules suggest that they are able to help physicians improve practice. The data from the interviews can help the creators develop modules that enhance the factors that inspire physicians to make changes in their practice and not just fulfill the requirement.
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Introduction

Our healthcare system suffers from major gaps in practice that constitute a serious risk to the American public. The government, payers, healthcare organizations, regulatory organizations, patient advocacy group and other stakeholders in the healthcare system are calling for reform and changing policies and practices to promote improvement in the quality of care patients receive. Physician organizations are no exception. The American Board of Medical Specialties (ABMS), the organization that oversees the board certification of physicians, developed a requirement that uses the process of Maintenance of Certification (MOC) to have physicians complete improvement cycles to help them increase their compliance with basic standards of practice. To meet this requirement, called Part IV Practice Performance Assessment, some specialty boards have developed self-directed, web-based modules that bring providers through each stage of improvement.

The main goal of this study is to investigate the impact of participating in web-based Part IV modules created to meet the MOC requirements. Since this is a new policy, there has been little investigation into the impact of the modules on physicians’ practices. This pilot study is meant to establish if data from three modules indicate an improvement in performance as a result of participation. In addition, while these data speak to the outcomes of these modules, interviews of participants provide data about the broader question of what physicians think of the requirement, their view of the process, and the impact their participation had on their practices.
To understand the context in which these web-based Part IV modules are created, the background about this gap in practice will be reviewed, as well as the evolution of quality improvement in healthcare. The intersection between quality improvement and board certification will be discussed, followed by the evolution of the certification process. This background will help explain the model of Part IV modules as well as the current research available about these modules.

**Background**

**Gaps in Care to Patients**

Gaps exist between the care that patients should receive as prescribed by guidelines and the care that they actually receive in practice. Because of concerns over the quality of care patients receive, the Institute of Medicine (IOM), a nationally-recognized, independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers about health care, created the Committee on the Quality of Health Care in America. This committee was charged with identifying “strategies for achieving a substantial improvement in the quality of health care delivered to Americans” (Institute of Medicine, 2001). The two reports this Committee produced were seminal in illustrating the severity of the gaps that exist in practice and in defining ways to improve care.

For years medical errors were not recognized or discussed only behind closed doors (Kohn, Corrigan, Donaldson, & Institute of Medicine (U.S.). Committee on Quality of Health Care in America., 1999). There was no required system to report medical errors and accountability for these errors went unanswered unless litigation was brought
against the doctor or hospital. Published in 1999, the first report, *To Err Is Human*, generalized two important studies about medical errors in two different health care systems as a way to estimate the number of preventable deaths that occur as a result of mistakes in health care delivery across the US. These studies suggest that preventable medical errors are responsible for at least 44,000 and at most 98,000 deaths in hospitals across America. "More people die in a given year as a result of medical errors than from motor vehicle accidents (43,458) or breast cancer (42,297)"(Kohn, et al., 1999). By contrast, one initial study in 1998 that highlighted the gaps in care, estimated the deaths caused by preventable medical errors at 7,000 per year (Chassin, Galvin, & Natl Roundtable Hlth Care, 1998). *To Err Is Human*, demonstrated the problem to be much larger than initially estimated and established that the need to improve care was just as important as the quest to cure breast cancer or prevent car accidents.

When the report was first published, physicians disputed the research methods used to calculate the estimated number of deaths due to medical errors; particularly what could be considered "preventable" medical errors (McDonald, Weiner, & Hui, 2000). Others questioned from where the funding for implementing the changes recommended would come, especially the installation and up-keep of electronic health records (Brennan, 2000). Despite these initial reservations about the report, all members of the health care industry have come to support the basic call to action to reduce preventable medical errors. The influence of the IOM is so great that they were able to make the reduction of medical errors a national health care priority.
The second IOM report, *Crossing the Quality Chasm*, broadened the scope of the problem. It not only examined medical errors in in-patient settings, but also showed the general gaps between evidence-based practices and actual practice in both in-patient and out-patient settings. The report added to the catalog of studies about gaps in care first highlighted by a meta-analysis published only three years before (Chassin, *et al.*, 1998). The study, *How Good Is the Quality of Health Care in the United States?*, examined a variety of studies of current practice over a 10 year period to determine the quality of care that patients receive. The study estimated that only 70 percent received recommended acute care and only 50 percent of patients received recommended preventative care. “For chronic conditions, 60 percent received recommended care and 30 percent received contraindicated care” (Chassin, *et al.*, 1998) (Figure 1). This shows that not only are some patients not receiving care that is considered the basic minimum that everyone should receive, but as many as 30% of patients are actually receiving care that could cause harm. A more recent study by McGlynn and colleagues reported that the U.S. health care system delivers evidence-based care to patients only 55 percent of the time (McGlynn *et al.*, 2003). The second IOM report updated this study by continuing to catalog other studies that show gaps in care. It called for “a sweeping redesign of the American health care system” (Institute of Medicine, 2001).

Figure 1 shows the gap that exists between recommended care and care patients actually receive. The white bars show the current estimate of patients who received recommended preventative care, acute care, and chronic care. The gray bars show the
percentage of patients with acute and chronic conditions who receive contraindicated care.

![Diagram showing the gap between recommended care and care received](http://www.rand.org/pubs/research_briefs/RB4524/index1.html)

**Figure 1: The Gap Between Recommended Care and Care Received**

The IOM reports made the quality of health care in the US a national priority, alerting health care professionals, payers (i.e., insurance companies), and patients to the problems that exist.

**US Health Care versus Other Developed Countries**

These data show a major problem with health care, but they do not show if or how the US health care system could be better. Some may claim that health care is an industry where implementing ideal care all the time is not possible. But, when one compares the US health care systems to other countries' health care systems, the problem becomes even more striking. In the US, the cost of care is growing at an alarming rate yet the quality of
care is below the standards seen in other developed countries. US health care ranks 19th out of 33 developed nations included in the regular reports on health care by the Organisation of Economic Co-Operation and Development (OECD). The US spends the most on health care—about 16 percent of gross domestic product—while other developed countries maintain expenditures below 12 percent ("Organisation for Economic Co-Operation and Development. OECD Health Data 2009 – comparing health statistics across OECD countries," 2009). The line graph below shows the expenditure on health over the last 67 years for OECD member nations. The line representing US expenditures is ascending more steeply than those of other nations, showing that expenditures are on a sharp, upward trend.

Figure 2: Total Expenditure on Health, % Gross Domestic Product 2009
Despite spending far more money on health care, the quality of that care in the US is below that of other developed countries. The US has more deaths attributed to deficiencies in health care than 19 other nations, and during the last six years the US has
not experienced a similar rate in the reduction of deaths tied to health care problems as other nations. Even though there are questions about the quality of the data collected by the OECD, the same standards have been used over time. Therefore, these standards should show that the US is improving at the same rate as other countries despite any issues with data collection. Instead, the data show that other countries are reducing the rate of deaths attributed to inadequate health care at a quicker rate than the US. The bar graph below illustrates the number of deaths from deficiencies in health care for the top OECD member nations.

**EXHIBIT 3**

Percentage Decline in Mortality from Amenable Causes And Other Causes of Death Among Males Ages 0-74 in Nineteen Countries from 1997-98 to 2002-03

![Bar graph showing percentage decline in mortality](image)

**Source:** Authors' calculations based on data from the World Health Organization mortality database.


Figure 3: Mortality Amenable to Health Care (Nolte & McKee, 2008)
Major Organizations that Measure Health Care Quality and Standards for Determining Quality of Care

The study by Chassin et al. lamented the fact that there is not a national system for collecting and reporting data on the quality of health care (Chassin, et al., 1998). Without such a system, there is no way to know the status of the gaps in care. Since the IOM reports were published in 2000 and 2001, without continual reporting of data, there is no way to know if the gaps are improving or widening, or if they exist at all. As a result, the measurement of the quality of care delivered to patients has become a national priority. Yet the fractured nature of the US health care system makes the collection and regular reporting of such data a challenge. There is no single repository for such data and no one institution or group controls or oversees the system as a whole to be able to pull these data together. As a result, individual groups need to make data collection and reporting a priority. Payers of health care have taken the initiative by measuring the quality of care delivered to patients on a national level. They have a vested interest in improving the quality of care, which will reduce the cost of health care, which surpassed $2.3 trillion in 2008, more than three times the $714 billion spent in 1990, and more than eight times the $253 billion spent in 1980 ("Centers for Medicare and Medicaid Services, Office of the Actuary," 2010).

The National Committee for Quality Assurance (NCQA) is one of the national organizations that have taken the steps to develop a national system for measuring quality of care. The NCQA "is a private, nonprofit organization dedicated to improving health care quality. NCQA accredits and certifies a wide range of health care organizations," including insurance plans and managed-care organizations("About NCQA," 2010).
NCQA's Health care Effectiveness Data and Information Set (HEDIS®) is the most widely used performance measurement tool in health care with more than 90 percent of American health plans using HEDIS to measure performance of their members. HEDIS includes more than 70 measures of health care quality. These measures represent standards of care ranging from proper vaccination for adults, to appropriate preoperative care for patients who are undergoing bypass surgery.

For a standard of care to become a measure in HEDIS, the NCQA defined attributes that guide how measures are developed. These standards dictate that measures be relevant to practice, scientifically sound, and feasible to assess ("Desirable Attributes of HEDIS," 2010). Relevance is determined by looking at the prevalence and impact of the condition, while considering other factors, like cost effectiveness of treatment and potential for improvement.

Scientific soundness is the strength of the evidence that supports the measure. Guidelines are an important source of evidence to support measures. "Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances" (Institute of Medicine, 1990). Guidelines can be developed based on high-quality evidence like randomized control trials (RCTs) or meta-analyses, or, if that level of evidence is not available, consensus or expert opinion. HEDIS measures tend to be based on solid evidence from RCTs when they are available.
Lastly, the measure must be feasible. This criterion requires that what is being measured can actually be measured. It looks at logistical feasibility and other realistic concerns for health plans to report the data to the NCQA.

Since 1996, the NCQA has published a report titled the *State of Health care Quality* (SOHQ). The report lists the aggregated data collected from the health plans on each HEDIS measure. According to the NCQA, “HEDIS is designed to provide purchasers and consumers with the information they need to reliably compare the performance of health care plans,” ("What is HEDIS," 2010). The SOHQ is the most comprehensive report available that gives specific data on the gap in care that exists on each of the measures assessed.

In addition, the latest SOHQ report states after seeing years of improvement, recently progress to improve the quality of care has slowed or stalled completely.

Across many key measures of clinical quality, plan performance is flat. This breaks a 12-year run of significant progress. While it could be a 1-year blip, I fear it may be the beginning of a troubling trend. Commercial health plans — with a significant push from large employers — have achieved some remarkable results year after year, but in 2009, that progress has halted. Perhaps more troubling, 2009 marks the third consecutive year of meager progress in quality for Medicare and Medicaid beneficiaries served by health plans. These warning lights cannot be ignored. This is not to say there haven’t been improvements in all three markets. There have, but they are not enough ("National Committee for Quality Assurance. The State of Health Care Quality 2008,").

The NCQA is not the only organization to collect and report data on health care quality. The Agency for Health care Research and Quality began producing the National Health care Quality & Disparities Reports in 2002. And the Joint Commission, which is responsible for accrediting hospitals, produces The Joint Commission’s Annual Report
on Quality and Safety and has a website Quality Check that reports data collected from accredited institutions. Only with the effort of these organizations to regularly collect, analyze, and openly report quality data can the US assess the current state of health care and the effects of changes to the system.

**Measuring Quality of Care Is Against the Traditions of Medicine**

Traditionally, the commitment to patients and patient care has been seen as an individual endeavor.

The metaphor that informs the medical conscience is that of selfless attending on a single patient, no matter what the hour or other calls on physician’s time. This singular battle with disease reverberates throughout the medical profession and is supported by the traditional medical ethics focus on the individual doctor-patient relationship (Brennan, 2002).

The idea of an individual’s commitment to his/her patient is very powerful and has informed the basic view of quality in health care: one physician – one patient. A good doctor is one that tirelessly attends to a patient day and night. However, this idea does not reflect the current realities of medicine, which involves using evidence-based standards based on groups of patients to guide the treatment options of other groups of patients.

The initial investigations into epidemiology and quality started to change the view of quality of care from the work of an individual for an individual to the work of the many to care for the many. Decisions about how to treat a patient were first seen as the “art of medicine.” A physician would use his expertise and experiences to decide on an appropriate treatment for patients. However, with the ability to collect and analyze data
from thousands of patients, a physician is now expected to use the evidence from these analyses to determine the proper course of care.

The first steps to creating these standards of care occurred as researchers developed the ability to classify patients into categories and to determine appropriate care for each class of patients. These first attempts to assess the quality of care started in the 1960s with the work of John Williamson, Kerr White, George Miller, and later in the 1970s, with the work of Robert Brooks at Johns Hopkins. These physicians “provided a stimulus for the melding of two fields – the study of quality and the study of epidemiology” (Brennan, 2002). Basically this connection between quality and epidemiology, referred to as health care accounting, meant that the study of the incidence, distribution, and control of disease in populations could be used to determine the quality of care that patients received.

These initial studies by the researchers at Johns Hopkins were not only considering what would be good for a single patient, but also what kind of care would be appropriate for a class of patients, which eventually led to assessing if the class of patients actually received that care. It also led to the development of standards of care that patients in each class should receive.

**Barriers to Measuring Quality of Care**

The new idea of measuring the quality of care delivered to patients was not widely accepted. Even with early efforts in epidemiology and quality of care, before 1998 very little was known about the quality of care delivered to patients in the US (Kizer, 2000). The tradition of medicine as a profession where individual effort and care was tailored for
individual patients was a major barrier to the acceptance of measuring quality through the analysis of the care provided to large groups of individuals.

Also, since the measurement of positive outcomes in medical care is ambiguous when compared to other professions or industries, it is difficult to determine what high-quality care exactly means. Patients become sick and die despite the best care. Distinguishing poor care as the cause of a patient's decline versus some other natural cause is difficult.

Quality is more easily measured in industries other than health care. It is easier to judge whether a car works properly, than it is to determine if appropriate care is delivered to a patient. Consequently, more is known about the quality of automobiles and the airline industry than health care.

This began to change in 1998. Two independent studies by the RAND Corporation for the Institute of Medicine's National Roundtable on Health Care Quality and by the President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry, both called attention to problems with the quality of care that patients receive from the country's health care system (Chassin, et al., 1998),"President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry. Patients' Rights and Responsibilities," 1998). These studies lead to the seminal IOM reports and finally a regular measurement and analysis of quality data by many organizations and most notably, the NCQA and AHRQ.
The System AND the Individual

It takes years for evidence-based medicine to be implemented into practice. “In 1996, 15 years after the results of the Beta-Blocker Heart Attack Trial had been made known, beta-blockers were being prescribed for only 62.5 percent of patients who had had a myocardial infarction” (Lenfant, Chobanian, Jones, & Roccella, 2003). The data from this trial were conclusive. A special article was published in *Journal of the American Medical Association* to ensure that the benefits of the findings of this trial were disseminated as soon as possible. Yet 15 years later, this easy-to-implement, evidence-based practice supported by the results of this study and reinforced by subsequent trials were still not implemented into practice. This one case illustrates a problem that is pervasive in medicine. It takes too long for evidence-based medicine to be implemented into practice causing major gaps between recommended care and actual care.

There are many different reasons that gaps in care exist. *To Err Is Human* unapologetically blames the health care system for the gaps in care. The report expressly states that the IOM is “not…pointing fingers at caring health care professionals who make honest mistakes. After all, to err is human. Instead, [the] book sets forth a national agenda--with state and local implications--for reducing medical errors and improving patient safety through the design of a safer health system” (Institute of Medicine, 2001).

As a result, *To Err Is Human* shifts the focus from the clinicians as a source of the problem to the system as the culprit.

The IOM’s emphasis on systems avoided “the conundrum of malpractice and [individual physician] blame because significant data from outside the medical profession
support the efficacy of a systems-based approach to quality improvement” (Brennan et al., 2004). The desire not to alienate physicians by blaming them for problems with quality, combined with the lessons learned from other businesses, like airlines and car manufacturers, led to a systems approach to improving quality in health care that widely ignored individual physician contribution to improving care.

It has been argued that physicians have been silent in this quality improvement movement (Millenson, 2003), (Audet, Doty, Shamasdin, & Schoenbaum, 2005), (Brennan, 2002), (Brennan, et al., 2004). With article titles like The Silence (Millenson, 2003), or sections entitled, Where are the Physicians (Brennan, 2002), the general tone of disappointment in physicians’ lack of participation and leadership in the quality movement is evident. These system-based approaches are meant to support physicians; however, individual physicians who are not in administrative positions have not been the catalyst for these changes.

Individual Contribution to Gaps in Care

The IOM’s emphasis on system issues and avoidance of other causes of errors and gaps in practice is limiting. A meta-analysis by Cabana et al., called Why Don’t Physicians Follow Clinical Practice Guidelines?: A Framework for Improvement, takes a different tack (Cabana et al., 1999). The focus clearly is on the physician and shows that physicians are at least partially responsible for closing the gap in practice and improving the care of patients.

The analysis by Cabana, et al., examined an extensive number of studies that evaluated barriers to implementing guidelines into medical practice. The study
developed a framework to understand why clinicians do not adhere to guidelines. The figure below illustrates the basic structure Cabana, et al., created to demonstrate possible reasons why clinicians do not adhere to clinical guidelines. Though the study cautions that these reasons “may not be generalizable, since barriers in one setting may not be present in another” (Cabana, et al., 1999), they do provide a framework to analyze the reasons for these failures to comply with guidelines and, thus, suggest strategies to overcome these barriers.

The barriers are broken down into three main categories based on the sequences of behavior change: Knowledge, Attitudes, and Behavior. Each category has multiple causes that are explored.

Figure 4: Barriers to Physician Adherence to Practice Guidelines in Relation to Behavior Change (Cabana, 1999, p. 1458)

This study underscores the fact that the system alone cannot close gaps in practice. Every system is dependent on the people who work in it and, in medicine, the clinical judgment of the physicians is key to determining and carrying out the best care for patients. If a physician does not know about a new guideline or does not agree with
Involving Physicians in Improving Health Care

In order to improve quality, all stakeholders of health care need to be moving forward with improvements. Though the IOM emphasized the system, the physicians are a key piece to improvement. The IOM’s initial reports almost excused physicians from responsibility and physicians responded in turn by pointing the finger at the system as the cause of the problem. The question still needs to be answered as to how to involve and motivate physicians toward this path of improvement.

The American Board of Medical Specialties (ABMS) is a national organization that controls the requirements for certification for physicians. It is a key stakeholder that is in a position to effect a change in physicians’ attitudes and to motivate them to become more involved in the improvement effort. This next part of the paper will describe the history of certification and delineate the ABMS policies that are aimed at increasing physician involvement in improvement. These policies are the general focus of this study.

History of Certification and the ABMS

In order to understand how Maintenance of Certification (MOC) can effect improvement, it is important to review the history of the certification of physicians and of the ABMS itself. In the early 1900s, many improvements in medical science led to a further specialization by physicians into different areas of medicine. Despite this development of subspecialties, “each physician was the sole assessor of his or her own qualifications to
practice a given specialty” and “there was no system to assure the public that a physician claiming to be a specialist was indeed qualified” (ABMS, 2009). The ABMS was created with the purpose of assuring the public of the qualification of the physicians practicing medicine and as the public’s demands on the health care system have changed so have the requirements for certification.

Made up of 24 Member Boards in all areas of medicine, the American Board of Medical Specialties acts as the guiding organization that helps create systems for certifying physicians. Table 1 shows the 24 Member Boards for physicians.

<table>
<thead>
<tr>
<th>The 24 Member Boards of American Board of Medical Specialties</th>
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<tr>
<td>Allergy and Immunology</td>
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<td>Colon and Rectal Surgery</td>
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<td>Emergency Medicine</td>
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<td>Internal Medicine</td>
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<td>Obstetrics and Gynecology</td>
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<td>Physical Medicine and Rehabilitation</td>
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<td>Preventive Medicine</td>
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<tr>
<td>Radiology</td>
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<td>Thoracic Surgery</td>
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Table 1: List of 24 Member Boards of American Board of Medical Specialties
When the ABMS was first created in 1933, the focus was on initial certification of physicians through standardized board examinations that were meant to assure that physicians had the knowledge necessary to practice. In the 1970s, “the recognition that initial certification represented merely a single snapshot evaluation of the qualifications of a doctor specialist led ABMS member boards to begin offering ‘recertification’” (Horowitz, Miller, & Miles, 2004). Most boards did not require recertification until 1990 and only Family Medicine has always required some form of recertification. Though this initial certification was still important, it did not reflect the rapid changes in medicine that require physicians to stay up-to-date with the latest advances in order to practice. The number of trials conducted has grown to nearly 10,000 annually and make it impossible for physicians to read the primary literature (Chassin, et al., 1998). For individual physicians to keep up with the rapid pace of medicine, regular study and continual learning is necessary.

Recertification for most boards consisted of maintaining a state license, participating in Continuing Medical Education (CME), and taking a recertification examination every 6-10 years depending on the specialty of the physician. Some physicians were “grandfathered” into the recertification system and were allowed to keep their certification without participating in the recertification process. Like the original certification process, this program focused on assuring the public that physicians had the knowledge necessary for practice.

In 2000, the ABMS system of recertification evolved to a system of MOC. This changed the emphasis from single points of certification and recertification into a system
that emphasizes continuous professional development (ABMS, 2009). This process is based on the six core competencies adopted by ABMS and Accreditation Counsel of Graduate Medical Education in 1999. These competencies consist of the following: medical knowledge, patient care, interpersonal and communication skills, professionalism, systems-based practice and practice-based learning.

With these six core competencies as their guide, the ABMS created a system of MOC with four parts:

- **Part I - Professional Standing**
  Medical specialists must hold a valid, unrestricted medical license in at least one state or jurisdiction in the United States, its territories or Canada. [State Licensure]

- **Part II - Lifelong Learning and Self-Assessment**
  Physicians participate in educational and self-assessment programs that meet specialty-specific standards that are set by their member board. [Continuing Medical Education]

- **Part III - Cognitive Expertise**
  They demonstrate, through formalized examination, that they have the fundamental, practice-related and practice environment-related knowledge to provide quality care in their specialty. [Traditional Board Exam]

- **Part IV - Practice Performance Assessment**
  They are evaluated in their clinical practice according to specialty-specific standards for patient care. They are asked to demonstrate that they can assess the quality of care they provide compared to peers and national benchmarks and then apply the best evidence or consensus recommendations to improve that care using follow-up assessments ("American Board of Medical Specialties Maintenance of Certification,").

This evolution of MOC and the addition of the Part IV requirement, Practice Performance Assessment, is the focus of this study.

**Who Participates in MOC and Why?**

While maintaining licensure, which is handled individually by states, is mandatory for physicians to practice in the US, Board Certification is not required. Yet, "only 23% of general internists and 14% of subspecialists choose not to renew their respective certificates" showing that even though it is not required, Board Certification is still
important to most physicians (Lipner et al., 2006). Lipner, et al. conducted a study in 2006, before the Part IV requirement was added, that investigated possible reasons that physicians maintain their certification even though it is not required by law. This study showed that though some physicians are required by at least one employer to maintain certification, many physicians cited professional reasons as the primary reason that they participate in the MOC program. The most cited reasons were maintain professional image, update knowledge, and/or maintain or improve quality of patient care. This shows that most physicians recognize the MOC process as an opportunity for professional growth or at the very least as a tool to demonstrate professional growth and competency to patients and/or employers.

Yet, while this study shows many physicians participate for reasons other than requirements, there are other physicians who believe the MOC process is a “discriminatory, money-making juggernaut with marketing to hospitals, insurers, and licensing boards, and—without any reasonable proof of efficacy—are slowly being tied to the right to practice medicine” (Benbassat, Zanga, & Dubravec, 2011). Many employers are requiring physicians to maintain their certification and payers are offering higher reimbursement rates or incentives for participating in MOC. For example the Center of Medicare & Medicaid Services has a Maintenance of Certification Program Incentive as a part of Physician Quality Reporting System (PQRS). This program provides a financial incentive if physicians participate in MOC “more frequently than is required to qualify for or maintain board certification and successfully complete a qualified Maintenance of Certification Program practice assessment” (Centers for
Medicare and Medicaid Services, 2013). This shows that even though MOC is regarded as voluntary, to gain employment and to enable maximum reimbursement, physicians must participate in the system, which has continued to charge the conversation around MOC. Physicians feel compelled to participate and the Boards have been accused of spending more time lobbying to organizations to require participation than making the process meaningful for physicians.

**Certification Is About Quality**

The certification process, whether it is initial certification, recertification, or MOC, has always "either explicitly or implicitly addressed the issue of quality by setting standards by which to evaluate the training and cognitive knowledge of those seeking certification in the discipline represented by their board" (Horowitz, *et al.*, 2004). The evolution of the certification process correlates with changes in the perception of quality in health care in general. While the initial concerns about quality were about the specialization of different areas of medicine and the recertification process addressed the concern that physicians were not keeping up with current advances in medicine and therefore could not provide quality care, the latest MOC process is influenced by concerns about the variation in the implementation of evidence-based guidelines for quality care. This shift in requirements is a result of a shift in thinking about what quality care is and how it can be achieved. By looking into this change in thinking about quality, one can understand more fully the implementation of a Practice Performance Assessment for MOC and the movement from which it has grown.
Role of MOC

Since physicians can practice without maintaining their certification, the question then becomes what does board certification mean? Unlike in other countries where certification is required, in the US it is expected that only 85% of physicians will be able to meet all the requirements and pass the exam to become board certified (Brennan, et al., 2004). Board certification represents an elite status and lets the public and employers know that physicians who are board certified meet a certain standard.

Studies have shown that certification has been associated with a decreased likelihood of discipline (Kohatsu, Gould, Ross, & Fox, 2004) and that “physicians scoring in the top quartile [of their maintenance of certification exams] were more likely to perform processes of care” in different areas of medicine (E. S. Holmboe et al., 2008). In addition, a 2008 study linked recertification to positive clinical outcomes. The study “demonstrated that frequency of antihypertensive treatment intensification, a process measure known to be linked to clinical outcomes, decreases as the time since the physician’s last board certification increases. These findings offer quantitative evidence in support of mandatory recertification” (Turchin, Shubina, Chodos, Einbinder, & Pendergrass, 2008). This shows that people are looking into the relationship between certification and quality and think that certification may have a positive effect on the quality of care delivered to patients.

While this shows MOC as a way for physicians to demonstrate to the public that they are proficient, it is also seen as an element of professional development. Participating in continuing medical education, studying for the board exam, and
participating in Practice Performance Assessment are meant to help physicians learn and grow throughout their career. Though the regulatory aspect of MOC that is tied with reimbursement and employment is a major aspect of the process, the educational component to MOC is the main focus of this research.

**MOC Can Reach More Physicians**

As described above, physicians have been accused of being absent from the quality movement. For physicians that are a part of large organizations or hospitals, quality is seen as something that someone else is supposed to handle. There is a quality improvement department or a quality officer whose job it is to improve practice. Physicians feel that quality improvement is handled through these mechanisms and is not their responsibility. Since physicians are responsible for handling their own MOC, this process can encourage physicians to take a more active role in improving quality.

In addition to instigating the involvement of physicians in larger organizations to participate actively in quality improvement movements, MOC can also reach physicians in smaller practices. While large employers can set standards for providers and hold them accountable, many physicians work in solo or small practices where there is little oversight of the quality of care delivered. Physicians are paid by insurance companies that have little to no control over the practice site. Board certification can reach these physicians who are in smaller practices that may not have the resources to focus on quality and through an educational capacity affect change. With current quality improvement initiatives focusing on systems changes, “policies and proposals aimed at fostering the diffusion of [quality improvement have not taken] into consideration the fact
that the majority of U.S. physicians now provide care in the solo or small-group practice setting (2-9 physicians)—where, according to the results of [a] survey, the adoption of [quality improvement] has been lowest” (Audet, et al., 2005). Policies that focus on hospitals and systems are guaranteed to miss small or solo practices, where most physicians work. Board certification may be the answer to reaching these physicians.

In addition, strategies to include physicians in the quality improvement initiatives cite education as essential to foster physician involvement (Audet, et al., 2005). Since MOC is a process that is focused on the individual and has already shown some promise in its relationship with quality, it seems that there is a role for MOC to play in this quality movement.

**MOC More Than Just Knowledge**

The initial certification and the recertification processes, which were the precursors for the MOC process, focused on assessment of physician knowledge through examination to ensure that physicians have the necessary knowledge to provide quality care based on the best available evidence. Though “knowledge is an important foundation for clinical judgment and decision making in complex situations, modern health services research has shown that knowledge is essential but not sufficient” (Cassel & Holmboe, 2006).

Physicians may answer a question about treatment on a test properly, but may not provide that treatment to patients in practice. This is the impetus behind the changes to the MOC process and the inclusion of the Part IV Practice Performance Assessment requirement.

In 2000, the ABMS developed these new requirements for physicians to maintain their certification and mandated each Member Board to implement this system by 2010.
While the ABMS developed the basic requirements for the system of MOC, the specific way these requirements are implemented is determined by each Board.

The requirements for Part IV are left broad to allow for each Board to implement what will work best for their diplomates. The *Standards for ABMS MOC® (Parts 1-4) Program* approved March 16, 2009, says that the “Boards should base their requirements on a complete cycle of initial assessment, improvement activity and re-assessment. Currently, the [American Medical Association Physicians Recognition Award] AMA PRA Category 1 Practice Improvement credits meet this criteria, provided all stages are completed” (American Board of Medical Specialties, 2009). Though the ABMS leaves fulfillment of this Part IV requirement broad, they do point to the CME process of performance improvement, namely the AMA PRA Category 1 credit for performance improvement programs, as a guide for implementing this requirement. Many Boards who create Part IV web-based modules are now following the same format and standards as the AMA system.

**Part IV Requirement for MOC and Performance Improvement of Continuing Medical Education**

In 2004 the AMA, the association that determines how CME credit can be awarded to physicians, designated performance improvement activities for credit. With this system, the AMA moved education out of the classroom and into the practice site of physicians. Many have noticed that:

Practicing physicians generally are not engaged in either the methods of performance improvement for health care or the measurement and reporting of clinical outcomes. The principal reasons are lack of compensation for such work, the perception that the work of performance improvement adds no value and is a waste of time, the lack of knowledge and skill in the use of basic tools for
outcomes measurement and performance improvement, the failure of medical educators to teach these skills, and the inability of mentors to model their use in practice (Staker, 2003).

By including performance improvement as part of CME, the AMA is hoping to use an existing avenue of learning to foster a new kind of education. They recognized value in the learning that takes place when physicians critically assess their performance and create and implement improvements into practice. Performance improvement programs follow the following basic program outline:

**Stage A: Learning from current practice performance assessment**
Through an initial chart review, participants are asked to assess current practice using a chart assessment tool based on identified performance measures.

**Stage B: Learning from the application of PI to patient care**
Based on the chart review data from Stage A, participants are asked to identify areas of their practice that need improvement. Participants create a plan for improvement and implement that plan into practice.

**Stage C: Learning from the evaluation of the PI effort**
3-6 months after completing Stage B, participants are asked to re-evaluate and reflect on the improvements they made in their practices, by completing a follow-up chart review and comparing it with the chart review assessment done in Stage A. (American Medical Association, 2010)

Physicians can receive up to 20 credits for completing a Performance Improvement CME activity. Even though the number of credits required for licensure differs from state to state, the most credits required are 50 credits annually and some states have no requirement. These 20 credits for Performance Improvement CME contribute significantly to that requirement.

Performance Improvement CME is based on “Edward W. Deming’s industrial and statistically driven model for quality improvement (plan, do, study, act or PDSA)” (Aparicio & Willis, 2005). Plan, Do, Study, Act is a quality improvement model created by Edward W. Deming based on Walter Shewhart’s Plan, Do, Check, Act model. Both
models use statistics to assess quality of production, institute a change and then reassess quality to ensure the effectiveness of the change.

The quality movement started with the ability to assess through statistics the quality of care delivered to patients and these measurements are the basis for implementing a quality improvement initiative. Whether the data are needed to determine the exact gap in quality or to convince physicians that improvements are necessary, this basic need for data is essential. Studies have shown that physicians cannot accurately self-assess their performance (D. A. Davis et al., 2006). In fact, physicians who perform at the lowest levels will report that they perform at the highest levels. This shows that not only are physicians bad self-assessors, but those who need to change the most, think they are doing the best, making it impossible for these physicians to believe that they need to improve and then work to make those improvements.

Since "the problems associated with small numbers [have led to] the quality regulators [adopting] approaches that aggregate physicians or providers at the group, health plan, or hospital levels" access to data that reflect individual physician performance is rare (Brennan, et al., 2004). Without these specific data, physicians cannot self-assess and can deflect blame by assuming that it is the performance of other members of the health plan or hospital that are the causes of the gaps in practice. Since MOC is based on the individual, the physicians are forced to create or assess their individual performance data making these deflections impossible.

The Plan, Do, Study, Act model of quality improvement was chosen because the AMA wanted to tap "into a familiar cycle to help Continuing Medical Education
providers and physicians establish a performance baseline, with data discovered and analyzed according to some individual, norm, or reference criterion” (Aparicio & Willis, 2005). The purpose of instituting this new type of CME is to “break artificial barriers between the quality improvement community and the work of Continuing Medical Education” (Aparicio & Willis, 2005) and it allows CME to focus directly on implementing quality improvement in practices. In addition, it allows for individual physicians to learn about quality improvement processes, which may not have been covered in medical education. The same ideas apply to MOC.

**MOC Part IV Practice Based Assessment Programs**

Though ABMS has the power to institute requirements and standardize systems for certification for all of its Member Boards, most of the catalyst for change has come from the Boards themselves. For quality improvement, the American Board of Internal Medicine (ABIM), the largest of all of the Specialty Boards, was on the forefront in recommending and implementing change. In 1995, five years before the ABMS announced their recommendations, the ABIM convened a committee to discuss ways to assess physicians’ practice performance. It was this committee, the Committee on Assessment of Practice Performance, that first recommended that the ABIM assess performance in addition to assessing knowledge in its recertification process (Kassirer, 1996). This recommendation is what eventually led to the policy change at the ABMS. This policy change requires clinicians to participate in programs like Part IV modules.
Measures for Part IV Modules

A part of almost every Part IV module includes the assessment of practice through either a chart audit or a review of electronic data about practice by the physicians. This audit involves the review of patient data to determine if standards of practice are met and documented in the health record.

Measures are calculated by using guidelines for ideal performance to create specifications for a numerator and a denominator to determine a ratio or percentage of compliance with that guideline. Figure 5 illustrates this calculation.

\[ \text{Numerator: } \# \text{ of cases or patients in the denominator who received a specific clinical action required by the measure for performance} \]

\[ \text{Denominator: } \# \text{ of eligible cases for a measure or the eligible patient population} \]

\[ \% \text{ Compliance} \]

Figure 5: General measure calculation

For example, the National Osteoporosis Foundation guidelines clearly state that women 65 or older should have their bone mineral density (BMD) tested (Kanis et al., 2007). A measure based on this guideline would look at women 65 or older and see how many of them received a BMD test. If a physician wants to see what his/her performance rate is, he or she would determine the number for the denominator first. The physician would
look at his or her panel of patients and see how many of those patients are women who are also 65 or older. This number could be determined through a hand audit of patient charts or through a data report from electronic sources like electronic health record systems. Then, to calculate the numerator, the physician would see how many people in the denominator received the indicated care, which in this case is received a BMD test, which would be the numerator of the ratio. Figure 6 illustrates the Osteoporosis screening measure calculation.

\[ \text{Numerator:} \quad \text{\# of patients in the denominator who received a BMD test} \]

\[ \text{Denominator:} \quad \text{\# of patients who are women 65 or older} \]

\[ \% \text{ Compliance} \]

**Figure 6: Osteoporosis Screening Measure Calculation**

For example, a physician might have a panel size of 1,355 patients. Of those patients, 280 might meet the denominator criteria of being a woman who is 65 or older. Of those patients 157 might have received a BMD test. That would lead to a compliance rate of 56%. Figure 7 illustrates this calculation.
Figure 7: Specific osteoporosis screening measure with example numbers

This is a simplification of this process. Generally many measures will have exclusion criteria that will exclude certain patients who meet the denominator criteria but for whom the indicated care would not be appropriate. For example, a patient who is a woman 65 or older may have a terminal illness. In such a case, a BMD test would be inappropriate because the life expectancy of the patient would preclude a need to treat osteoporosis even if the patient had the condition. So in addition to basic denominator criteria, there are also specifications for exclusion criteria to make the compliance rates more aligned with appropriate care for all patients.

Measure calculations like this are used to help determine baseline performance of providers and their patients' health and then follow-up assessment to evaluate improvement. Most modules developed by the Boards and other medical organizations focus on physician performance rather than patient outcomes because of the logistics involved in measuring changes in patient outcomes. It is very easy to determine physicians' performance against the Osteoporosis screening measure described above. A
review of the charts of women 65 or older would enable the measurement of the baseline rate for the physician on ordering such a test. However, determining if an improvement in ordering BMD tests actually improves patient outcomes is more difficult to show.

There is established research that shows that BMD screening does lead to more recognition and treatment of osteoporosis which in turn leads to less fragility fractures, the hallmark of osteoporosis. But establishing this link in a short program meant to improve physician performance is difficult. Data would have to be collected on women 65 or older for physicians’ practice over years to determine if his/her patients were actually experiencing less fragility fractures. The impact on patient outcomes could not be determined in just a few months or a year, which is the normal timeline for Part IV Modules. As a result, modules tend to focus on aspects of physicians’ performance that have been proven to result in better patient outcomes through extensive research.

**What Leads to Successful Performance Improvement**

*To Err Is Human* and the follow-up report *Crossing the Quality Chasm* were instrumental in creating a path for all stakeholders to implement improvements to the health care system.

One measure of the impact of this report, the first in the series of reports by the IOM on the quality of health care in the United States, is that one can still refer to ‘The IOM Report’ and everyone will recognize the reference to *To Err is Human* (despite the fact that, as of this writing, the IOM has released approximately 250 reports since *To Err*). In fact, many argue that the modern field of patient safety began with this report’s publication (Agency of Health care Research and Quality, 2010).

As a result, discussions about policies for improving the quality of health care must stem from these seminal reports.
The IOM’s two reports both call for system changes in health care. The press release for *To Err Is Human* emphasizes that “there are no ‘magic bullets’ . . . and responsibility for taking action should not be borne by any single group of providers, but must be addressed by all parts of the health care enterprise” (Kohn, *et al.*, 1999). This supports a multi-pronged plan for improvement, a plan that affects all areas of the health care system.

As a result, many different organizations are trying to improve the care delivered to patients and are studying what is effective in instigating change. A report by the Agency for Healthcare Research and Quality (AHRQ) and the Stanford-University of California, San Francisco (UCSF) Evidence-Based Practice Center (EPC) called, *Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies* investigated what strategies are effective in improving physician performance. The *Closing the Quality Gap* report worked to “compile a critical analysis of the existing literature on quality improvement (QI) strategies.” According to the report, “the focus of the commissioned investigations is translating research into practice—identifying those activities that increase the rate with which practices known to be effective are applied to patient care in real world settings” (Agency for Health care Quality, 2004). The report identified nine strategies that the literature has shown to be effective to improve physician performance. The strategies are as follows:

1. Physician reminder systems (such as prompts in paper charts or computer-based reminders).
2. Facilitated relay of clinical data to providers (patient data transmitted by telephone call or fax, from outpatient specialty clinics to primary care physicians).
3. Audit and feedback (physician performance tracking and reviews, using quality indicators and reports, comparisons with national/State quality report cards, publicly released performance data, and benchmark outcomes data).
4. Physician education (workshops and professional conferences, educational outreach visits, distribution of educational materials).
5. Patient education (classes, parent and family education, pamphlets and other media, etc.).
6. Promotion of disease self-management (workshops, materials such as blood pressure or glucose monitoring devices).
7. Patient reminder systems (telephone calls or postcards from physicians to their patients).
8. Organizational changes (Total Quality Management or Continuous Quality Improvement programs, multidisciplinary teams, shifting from paper-based to computer-based recordkeeping, long-distance case discussion between professional peers).
9. Financial incentives, regulation, and policy (performance-based bonuses and alternative reimbursement systems for physicians, positive or negative financial incentives for patients, and changes in professional licensure requirements) ("Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies: Volume 1—Series Overview and Methodology," 2004)).

These strategies have been proven to be effective in practice and reinforce the general model of Part IV modules. For example, audit and feedback is implicit to the Part IV process and would happen for almost all modules as an essential aspect of the model. The other strategies, except for the incentive strategy, can be added to the improvement part of the Part IV modules. The extent to which modules are implementing evidence-based strategies and the extent to which participants of these modules are using these strategies are still unknown.

For example, the report recommends provider reminder systems as a way to improve performance. This could include the addition of an electronic reminder in a medical record system that would remind a physician to order a certain test when it is appropriate. The idea is that the reminder system would take the responsibility of remembering to order the test off the shoulders of the physician. A reminder would
standardize and systematize practices so that standards of care are not left to be forgotten by physicians.

An article by Holmboe, et al. Improving Care Via Certification Maintenance and the Web reported that participants of web-based Part IV modules were not using proven quality improvement strategies. The participants' interventions “failed to involve other members of the office health care team” (E. S. Holmboe, Lynn, & Duffy, 2008). And physicians “used the ‘work harder’ approach” to improvement (E. S. Holmboe, Lynn, et al., 2008). This shows that these modules need to find a way to emphasize the importance of using quality improvement techniques to improve performance and research to see which Modules are inspiring such systematic change is necessary.

The Context of Improvement

In addition to the strategies used to improve practice, the context in which physicians’ work plays a role in the effectiveness of any plan to improve performance. In a meta-analysis by Kaplan et al. context is defined as “anything not directly part of the technical...[improvement] process...Therefore, context may include factors relating to the characteristics of the organizational setting, the individual, his or her role in the organization, and the environment” (Kaplan et al., 2010). The study showed that the contextual aspects that were most important to the success of improvement projects were leadership from top management, organizational culture, data infrastructure and information systems, and years involved in improvement (Kaplan, et al., 2010). In addition, involvement of physicians, motivation to change, resources for the improvement project, and team leadership were other potentially important contextual
factors. These are all factors that cannot be controlled in the development of Part IV Modules. The impact of context on the success of Part IV Modules is yet unknown. If participating in such modules is only effective for clinicians who work in certain setting or have certain contextual factors, participation by all physicians maybe an unwise policy. Further investigation is needed to determine if this is the case.

**Investigations into the Impact of Online Part IV Modules**

Little research has been done to determine the effectiveness of online modules in general to improve physician performance or patient outcomes. A review of literature by Curran and Fleet “revealed that the majority of evaluative research on web-based CME is based on participant satisfaction data. There was limited research demonstrating performance change in clinical practices and there were no studies reported in the literature that demonstrated that web-based CME was effective in influencing patient or health outcomes” (Curran & Fleet, 2005). Though with the advent of Performance Improvement CME and the Part IV requirement, more studies have looked at the effectiveness of online programs to improve the quality of care delivered to patients, there is still a need to evaluate web-based activities to determine if they can impact physician behavior and patient outcomes when feasible.

**Effectiveness of Part IV Modules**

There have been some early studies that have evaluated the effectiveness of Part IV Modules to achieve their intended goal of improving physician performance. Though some early studies did document some improvements in practice (Simpkins *et al.*, 2007) (Duffy *et al.*, 2008) (Caverzagie, Bernabeo, Reddy, & Holmboe, 2009), these studies
were quite small or relied on self-report. The study by Simpkins, *et al.*, was a cluster-randomized trial that used electronic health record data and claims data to compare a control group to an intervention group who completed an Asthma Part IV module. Though the study design was appropriate and ambitious, the study enlisted only 19 subjects into the intervention group, and of those only 5 people completed all components of the program (showing a 74% attrition rate). Investigators did compare the data from those 5 participants to the data of the 21 physicians in the control group. Though no improvement was seen in the primary outcome listed, improvement was seen in the discussion of potential asthma triggers, a secondary outcome measure. This early study did not offer a promising picture of the effects of participation in Part IV Modules, but the small sample size and limited assessment techniques pointed to a need for more rigorous study. In addition, the study emphasized the problem with measuring the intended and unintended effects of any Part IV Modules. “In focusing on 1 aspect of asthma-related care, such as discussing asthma triggers, other processes may have been neglected by physicians in the intervention group” (Simpkins, *et al.*, 2007). This is referred to as “trade-off” and the implications of such behaviors need to be investigated according to the study and points to the need for more thorough investigations of the impact of these programs to affect both positive and negative results.

The most robust study to date about Part IV Modules is by Galliher and colleagues. It used electronic health record data to compare compliance with measures for the treatment of patients with type 2 diabetes before and after participation in a Part IV Module. They were able to recruit 76 physicians to the study and found that
“physicians participating in [Part IV Modules] demonstrated greater improvements over time in 11 of 24 measures” (Galliher et al., 2014). The study concluded that though participation was associated with greater improvements in care... the association between activity undertaken and specific improvements was difficult to demonstrate” (Galliher, et al., 2014). Unlike the study by Simpkins et al., this study was initiated after the participation in Part IV became required, so drop-out from the intervention groups was not an issue.

Caverzaghi and colleagues interviewed 21 out of 771 participants of a Part IV module on hospital-based quality improvement. In this study, the investigators determined that the module was in some cases a “catalyst to change” specifically for participants who do not normally participate in quality improvement in the hospitals (Caverzagie, et al., 2009). For physicians who have quality improvement backgrounds, participation in the Module dovetailed with already existing improvement practices.

The investigators determined that “physician’s engagement with the [quality improvement] process...mediated the impact of the [module]” (Caverzagie, et al., 2009). They separated participants into three groups, active engagers, passive engagers and non-engagers. Active engagers were familiar and actively involved in quality improvement processes at their hospital and found the module to be useful and relevant to practice. Passive engagers did not have “the skills or motivation to become involved in the [quality improvement] process” (Caverzagie, et al., 2009). The non-engagers are not involved in clinical practice enough to find the modules useful. One example was a clinician who
has a "small clinical practice and works mostly in the laboratory" (Caverzagie, et al., 2009).

The conclusions of this study focused more on the impact of the module to change the attitudes and broaden the awareness of physicians of improvement cycles. The focus was on the engagement of the physicians in the improvement process and not the fruits of the process itself. The impact of the module on improving practice is a logical next step for research.

**Physicians View of Part IV Modules**

In general, there exists "some degree of physician reluctance to participant in MOC" (Arnold, Hess, & Lipner, 2013). Even though the Boards work hard to promote the MOC process, the ABIM reports that physicians "object to the cost or time necessary to complete it" and some say it is not relevant to medical practice or will not improve clinical outcomes (Arnold, et al., 2013; Lipner, Hess, & Phillips, 2013). These generally negative attitudes may become even more prevalent as the process of maintaining certification becomes more involved and requires more time and money (Ting et al., 2014). As requirements strengthen, particularly with the addition of Part IV, it is important to investigate how physicians view the requirements ensuring meaningful participation.

A perspectives article by Levinson & Holmboe that described the MOC process reported on evaluation data from 9,800 experiences of physicians participating in Part IV Modules. They reported that:

90% of diplomates agreed or strongly agreed that reviewing their patient charts as part of the audit process raised their awareness of the quality of care their
practice provided, while 88% said the audit provided ideas on how to improve their practice. Overall, 73% of diplomates reported that they changed their practice as a direct result of completing a [Part IV Module], and 82% reported they would recommend the [Part IV Module] to a colleague (Levinson & Holmboe, 2011).

Though information on how these data were collected, the instruments used, and other relevant details were missing from the report, the data do suggest that physicians reported that participation was helpful in some way. Also, according to this article, diplomates found participating in Part IV more relevant to their practice than other parts of the MOC process, especially the board examination.

However, a survey conducted by the Board of Anesthesiology reported that diplomates found “the elements of Professional Standing [Part I] and Lifelong Learning and Self-Assessment [Part II] were perceived to be significantly more relevant to the practice of the diplomates than were the Cognitive Examination [Part III] and Practice Performance Assessment and Improvement activities [Part IV]” (Culley, Sun, Officec, & Warner, 2013). These conflicting reports highlight the need for more in-depth investigation into physicians’ perceptions of the requirements.

Another study by Arnold and colleagues investigated “physicians’ perceptions of MOC as a sequence of attitudinal changes” (Arnold, et al., 2013) going from viewing MOC as cumbersome and absent of value to relatively easy to participate and valuable as participants went through each stage of the process. This study starts with the premise that participating in MOC is similar to smoking cessation, blood donation, or healthy eating, in that it takes the position that participating in MOC is a positive activity that physicians may not want to do because either they do not believe in the value of the
process or there are too many barriers to participation. The study hypothesizes that as physicians move through the process, they will move through the stages of change from “Pre-contemplative” to “Contemplative” to “Preparatory” to “Action” and thus move toward valuing the process more and finding it less onerous than they thought. The results showed that while physicians who participated in MOC did find it less burdensome than they anticipated, their perception of the value of the process did not increase as the authors expected.

This study is problematic in its initial assumption of the inherent value of the MOC process. The study concludes that “the structure of MOC may have made it easier for physicians to overcome barriers to MOC participation but may have lacked adequate resources to promote the benefits of participating in the process” (Arnold, et al., 2013). This view fails to question the inherent value of MOC. It is possible that physicians’ perceptions of the value of MOC did not improve as much as expected because it was not valuable to them.

Another study by Holmboe, et al., surveyed 14 physicians who participated in the early launch of a Diabetes Part IV Module. This study reported that physicians found the self-audit of practice through chart review to be a positive step. The participants felt that the chart audit and patient survey were useful in assessing their practice. They felt that the audit gave them insight into their performance that they did not have and revealed gaps in care of which they were not aware (E. S. Holmboe et al., 2006). This study was implemented before participation in Part IV was required for most physicians and therefore, the dropout rate in this study was considerable despite incentives (33% dropout
rate. So the data included only represent participants who completed the project. This indicates bias in the results since it is probable that those who thought the process was useful would be more likely to complete the project in the absence of a requirement.

This study and the study mentioned above by Simpkins et al. both show that without the requirement, retention was a major issue. Though the institution of the requirement will improve retention, the fact that physicians did not complete the activity without the requirement provides evidence that physicians do not value the process.

**Issues with Part IV Modules and the Need for More Research**

Clearly, further research is needed to determine the appropriateness of the ABMS’s policy of requiring participation in Part IV Practice Performance Assessment and specifically the use of these web-based Modules to fulfill this requirement. Without evidence that proves participation in such activities is effective in improving performance and quality of care, how can the medical community truthfully endorse such programs, especially since the purpose of these programs is to increase physicians’ adherence to evidence-based practices? Without this evidence, the Boards will not be practicing what they preach, the essence of which is evidence-based practice. Yet the question still remains how to measure the effectiveness of Part IV activities and particularly the web-based Modules.

**The Impact of Part IV Modules: More than Moore**

Studying the impact of web-based Part IV Modules requires a clear understanding of what the expected outcomes of these programs are and how the programs can affect these outcomes. Clearly improvements in physician performance and possibly patient
outcomes can be assessed through the data collected as part of participating in the modules. In 2003 and again in 2010 continuing medical education researcher Donald Moore, Ph.D. developed and then refined the prevalent theory of evaluation for continuing medical education activities like Part IV Modules. The focus of this model, called the Moore Model, is on outcomes. The Moore Model as revised in 2010 consists of seven levels:

- Level 1: Participation
- Level 2: Satisfaction
- Level 3A: Learning (Declarative Knowledge)
- Level 3B: Learning (Procedural Knowledge)
- Level 4: Competency
- Level 5: Performance
- Level 6: Patient Health
- Level 7: Population Health (Moore, Green, & Gallis, 2009)

Moore developed this model based on the Kirkpatrick Model of evaluating the outcomes of a program (David A. Davis, Barnes, & Fox, 2003). Moore adapted the Kirkpatrick Model to fit the setting of medical education, emphasizing the measure and improvement of patient and population health as the gold standards for high quality continuing medical education. The model starts outcomes assessment with rates of participation to following the impact of education on physician learning, performance, and patient and community health. Table 2 provides descriptions for each level.
<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>The number of physicians and others who participated in the CME activity</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>The degree to which the expectations of the participants about the setting and delivery of the CME activity were met</td>
</tr>
<tr>
<td>Learning: Declarative Knowledge</td>
<td>The degree to which participants state <em>what</em> the CME activity intended them to know</td>
</tr>
<tr>
<td>Learning: Procedural Knowledge</td>
<td>The degree to which participants state <em>how</em> to do what the CME activity intended them to know how to do</td>
</tr>
<tr>
<td>Competence</td>
<td>The degree to which participants <em>show</em> in an educational setting <em>how</em> to do what the CME activity intended them to be able to do</td>
</tr>
<tr>
<td>Performance</td>
<td>The degree to which participants <em>do</em> what the CME activity intended them to be able to do in their practices</td>
</tr>
<tr>
<td>Patient health</td>
<td>The degree to which the health status of patients improves due to changes in the practice behavior of participants</td>
</tr>
<tr>
<td>Community health</td>
<td>The degree to which the health status of a community of patients changes due to changes in the practice behavior of participants</td>
</tr>
</tbody>
</table>

Table 2: Definitions of the Outcomes Levels of the Moore Model (adapted with permission) (Moore, et al., 2009).

The influence of this model on the development and evaluation of continuing medical education cannot be overstated. It is used by many stakeholders to assess the effectiveness of educational activities.

Olson and colleagues discussed the limitations of the Moore Model and the need to expand the model and educators’ thinking of how to measure the outcomes of educational activities (Curtis A. Olson, Shershneva, & Brownstein, 2011). Olson stated that though the Moore Model can establish improvements in practice, it does not account for how the educational activity contributed to those outcomes or what components of the
program contributed to the outcomes measured through the Moore Model. It focused on the difference between outcomes and impact, illustrating that the concept of outcomes, especially as measured through the Moore Model, is a narrow view of the larger concept of the impact of education. Though the model is a good start to discover the impact, it is at best a limited view and at worst an impoverished view of the actual impact of education.

The impact of these modules could have nothing to do with effects on knowledge, competence, performance or patient outcomes. For example, if participating in any form of professional development invigorates otherwise unhappy or unfulfilled physicians to become more engaged in their work, while this may not have the intended effect of improving a specific measure of performance, it is still an important impact. In this study, Olson et al. demonstrates that education was integral to the successful improvement projects studied, which begs the question, why are studies of the outcomes of education not showing this same type of impact. The answer has to do with a full understanding of the context in which education is attempting to make improvements and the short-sighted view of educational outcomes as a single point in time. More thorough investigations that look at impacts, as opposed to outcomes, and investigate the components of successful improvement may be more relevant to answer the question about the effectiveness of education and specifically MOC.

**Ideas for Expanding Evaluation beyond Moore**

One idea of how to expand evaluation from only reporting what happened as the result of an activity to how and why the results occurred is the use of the program theory as a
guide. This technique uses the rationale behind the components and structure of the programs to determine the fidelity to the theory and the effectiveness of the program and as a result, the theory to instigate the desired effect (Bickman, 1987). Evaluators can use program theory as the basis to evaluate programs by compiling richer kinds of data to determine the actual effects of the activity and also how and why the program works. It opens that figurative "black box" of programs to not only look at the outcomes of a program, but also why and how those outcomes were reached. As a result, evaluations based on program theory can be generalizable in a sense, since it could be said that other programs that have the same theoretical basis will work for similar populations.

Another way to expand the evaluation to collect richer data about how the program works is to develop a success model that describes what contributes to the achievement of improved performance (Brinkerhoff, 2003). This approach gives "attention to how and why the intervention contributes to any observed changes in practice" and allows planners of such activities to "understand the context that affect the effectiveness of an intervention and how to design more effective interventions" (C. A. Olson, Tooman, & Alvarado, 2010).

For this reason, this study will use mixed methods to help not only determine if Part IV modules can yield positive improvements in physician performance as measured by the modules, but also to look at how and why any results, whether positive or negative, are achieved. By looking at physicians’ experiences participating in the modules, the "black box" of how these programs work can be opened and more detail about the impact of these modules can be ascertained.
**Significance of the Study**

This study contributes to the examination of the impact of this new policy created by the ABMS and the web-based Part IV Modules created to meet the requirement imposed by the new policy. In addition, contextual factors are explored, which broaden the evaluation of these modules from a narrow view of outcomes based on compliance rates to performance measures to a broader view of the general impact of the modules overall on the physicians who participate. Through this investigation, a preliminary determination of the impact of these modules to improve physicians’ compliance with basic standards of care is ascertained. Furthermore, a deeper understanding of how these programs affect change is explored and can help planners of these programs understand how the context in which these programs are working influence success or failure, as well as what aspects of the program most contribute to improvement and what aspects do not.

**Study Design Overview**

**Research Goal and Questions**

The main goal of this study was to investigate the impact of participating in web-based Part IV Modules created to meet the MOC requirements. Since this is a new policy, there has been little investigation into the impact of the modules on physician performance. This pilot study is meant to establish if data from several modules indicate an improvement in performance as a result of participation. In addition, while these data speak to the outcomes of these modules, interviews of participants provide data about the broader question of the impact of these modules. The research questions were:
1) Do web-based Part IV Modules improve care delivered to patients as seen through the performance data collected by these modules?

2) What are the physicians' views of participating in web-based Part IV Modules? How do the modules impact changes in participant performance?

**Study Design**

There were two parts$^1$ to this study. In the first part, the data from three Part IV Modules were analyzed to see if these modules were able to show improvements in compliance with the clinical measures they hope to affect. In the second part, participants of three modules were interviewed to determine their views of participating in these modules and how their practices were impacted if at all.

The methods and results of Part I, the quantitative portion of the study, will be described in the following section. Then, the methods and results of Part II, the qualitative portion of the study, will be described. Since the two parts are related, the discussion for both the quantitative and qualitative sections will be reported together after the description of Part II. Lastly, the limitations of both parts of the study will be discussed at the end.

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$^1$ Please note: this study originally had a third part that involved interviewing the planners of these Modules to determine how the modules were created and what the planners expected of participating physicians. The first few interviews with planners did not yield the kind of information I was expecting and as a result, it was off topic. I thought the creators of these modules would have an expert understanding of the policies that led to the requirement being implemented and they would have detail about relevant theory that would be the basis of the creation of the modules. However, many of the planners were focused on following the requirements set by the Boards to get the projects approved and were very mindful of basic logistics for creating these modules and did not have extensive comments about theoretical basis for module creation or set models for physician participation. As a result, this part of the dissertation was not completed. In August of 2013 all members of my dissertation committee approved the change.
This study was approved by the Institutional Review Board of Boston University in May 2012. Efforts were made to keep the records of this study confidential by using pseudonyms to describe participants and their organizations in all research findings. All information has been de-identified and is kept on a secure server that is password protected. Identifiable data can only be accessed by the researcher and stored in a password protected secure server kept by Boston University. Identifiable information will be destroyed one year after the research is completed.

Methods and Results for Part I

Methods

Background

As described above, there are only a few studies that look at the expected impact of Part IV Modules. In an article about the evolution of MOC, the author states that “the long-term goal [of MOC] must be to get credit for improved outcomes associated with better patient care” (Miller, 2005). This shows that a main goal of this new requirement is to improve care. Therefore, an investigation of the ability of these modules to improve practice is an important place to start to assess impact. If this basic study of performance data as collected through the modules does not show improved practice, this would indicate a major problem with this new requirement.

Participants of these modules must conduct at least two audits of their charts to determine baseline and follow-up performance on the measures that are the chosen focus of the modules. For example, a module that is designed to help physicians improve their performance on compliance with guidelines for care of patients with diabetes may
include a measure that looks at the percentage of patients who had a foot exam at the last visit. A typical module would have a physician review the charts of the last 20 patients that he has seen who have a diagnosis of diabetes. If the participant completed foot exams for 10 patients, he would have a baseline rate of conducting foot exams 50% of the time. After working through the module and implementing improvements in practice, the participant would complete the same chart audit after seeing another 20 patients (generally not the same patients). Maybe this time, he conducted foot exams for 18 out of the 20 patients, giving him a follow-up rate of 90%. This would show an 80% increase in performance.

This study looked at the rate of compliance for a total of 31 measures collected for three different modules. Though these data were collected by the physicians themselves through a chart audit, the validity of such data has been shown to be high by studies by Holmboe, et al. and Simpkins, et al. (E. S. Holmboe, Lynn, et al., 2008), (Simpkins, et al., 2007). These studies compare data collected through self-audit and data collected through professional chart auditors. They found that the data collected through self-audit was not statistically different from the data collected through the professional auditors.

The data analysis looked at the Stage A (baseline) scores on each measure versus the Stage C (follow-up) scores. 25-35 patient charts are the standard number of charts reviewed by physicians for these modules. Though creators of modules do not offer reasons for choosing this number of charts, the feasibility of the audit is a major concern. Studies that look at the validity and reliability of physician-level performance
measurement have seen the need for sample sizes ranging from 44 – 346 patients depending on the measure (Eric S. Holmboe et al., 2010; Sequist, Schneider, Li, Rogers, & Safran, 2011). It would be very time consuming and difficult for physicians to complete chart reviews of this size. However, one must also consider the fact that the issues of sample size to indicate the effectiveness of quality improvement projects are different than for research studies (Perla, Provost, & Murray, 2013). Purposive sampling or judgment samples are more commonly used in quality improvement because they offer data that are more in tune with the context of the provider and the practice in question. These data are not about generalizability, but rather meant to establish baseline and follow-up rates of compliance to determine effectiveness of an intervention at a particular site.

However, when data are viewed from the physician level, the sample size turns to the number of physicians included in the study. For this study, the physician sample size included 100% of physicians who participated in the modules. Though this sample may not be reflective of all participants of all modules, the numbers are large enough to power the analysis. As a pilot study, this initial assessment into the effectiveness of three modules helps to lay the groundwork for further study to look into this question more rigorously.

**Recruitment**

In June of 2012, I emailed seven institutions that had developed web-based Part IV Modules. The seven institutions were part of a convenience sample. The institutions were identified through the websites of the American Board of Internal Medicine, the
American Board of Pediatrics and the American Board of Family Medicine. For institutions where I had personal contacts, I emailed my contacts to ask if their institutions were willing to participate (Attachment A., "Institution Recruitment Email"). One institution agreed to provide participant names and contact information for the study, but would not provide the data collected through the module because they had plans to use those data for their own research. One institution agreed to provide the data from the modules, but would not consent to contacting the participants for interviews because the user agreement for the module stated that the data would not be used by third parties for any purpose. Two institutions did not want to participate. Two institutions agreed to provide all the data needed for the study.

This convenience sampling technique was used for several reasons. First, in 2011, there were few organizations that created web-based modules that were approved to meet the Part IV requirement. Since there were so few organizations, the total population was very small, and without a consensus procedure, using a random sample would not yield more generalizable results. Also there was not enough information on each module and/or each organization to determine differentiating criteria that would allow for a meaningful purposeful sampling. Lastly, since organizations are reluctant to share data, my personal connection with the organizations chosen gave these groups the assurance that the data would be used responsibly and, therefore, made them more likely to agree to participate.
About the Modules

The topics of the three web-based Modules used for the quantitative part of this study were Obesity, Smoking Cessation, and Attention Deficit Hyperactivity Disorder (ADHD). Participation in all of these modules was free at the time of the study and open to all clinicians who had a panel of patients to review. Physicians can register and complete the modules at any time. Both the Obesity and Smoking Cessation Modules are still active as of February 2014. The ADHD Module expired in January 2013. Here is a brief description of each module and its measures:

Obesity Module

The Obesity Module was designed to improve primary care physicians’ practices in compliance with guidelines for the diagnosis and management of patients who are overweight or obese. Participants would register for the module, read instructions and then complete a self-assessment survey that included questions meant to assess knowledge, competency, confidence, attitudes, practice systems, and support. Then participants would complete the audit of 25 patients using a chart audit tool. Participants would then see a report that would show baseline compliance rates on all of the measures of the module. Also included were the compliance rates of other participants in the activity who have the same profession as the participant and national compliance rates with the measure if those were available. Next, participants would complete an evaluation and then move to the intervention section. Participants were required to complete two educational modules that included presentations on the diagnosis and management of patients who are overweight or obese and techniques for counseling
patients about weight management. Participants then were asked to review a list of evidence-based interventions for improving practice in the measures assessed. Participants would choose at least one area to improve and one intervention. Participants would then implement the change in practice and then attest that they implemented it. Participants were required to remain in the intervention stage of the program for at least four weeks. Then participants were allowed to complete the follow-up self-assessment and follow-up chart review that followed the same format as the baseline assessment.

Participants were asked to audit charts of patients who were obese or overweight. The chart review included the following measures:

1. **BMI Documented**: The percentage of patients 18-74 years of age who had an outpatient office visit and had their BMI documented in the last 12 months.
2. **Waist Circumference**: The percentage of patients who had weight circumference measured in the last 12 months.
3. **Weight Measured**: The percentage of patients who had weight measured in the last 12 months.
4. **Weight Management Intervention**: The percentage of patients with documented elevated body mass index (≥25 kg/m²) who received education and counseling for weight loss strategies, which include **nutrition, physical activity, lifestyle changes, medication, and/or surgery**, in the last 12 months. This measure was also broken down to see the percentage of patients who received each of these weight loss strategies individually.
5. **Assessment of Motivation**: The percentage of patients for whom any assessment of the patient's motivation and readiness for weight loss intervention was documented in the last 12 months.

6. **Medication Review**: The percentage of patients whose current medications were reviewed to see if they were contributing to weight gain.

7. **Side Effect**: The percentage of patients for which the side effect of weight gain was considered when changing or selecting medications.

8. **Comorbid Conditions**: The percentage of patients who were screened for the following comorbid conditions and secondary causes of obesity:
   
   a. hypothyroidism
   b. hypertension
   c. hyperlipidemia
   d. obstructive sleep apnea
   e. polycystic ovarian syndrome (for females only)
   f. type 2 diabetes
   g. metabolic syndrome
   h. Cushing's syndrome
   i. osteoarthritis

These measures were also combined to show the percentage of patients who were screened for all comorbid conditions.

The website discloses that the activity was supported by educational grants from GlaxoSmithKline and Allergan.

**Smoking Cessation Module**

The Smoking Cessation Module follows the same basic steps as the Obesity Module, though it does have a few extra steps. In addition to the baseline and follow-up chart reviews, an additional 10 charts were reviewed in the middle of the program so
participants can assess the effectiveness of their improvements. In addition, educational modules and other interventions were suggested to participants based on the areas that showed deficiency in the baseline chart audit and self-assessment survey. Here are the steps as described on the website:

1. Learning [sic] from current practice performance assessment
2. Complete a Practice Self-Assessment (45 min)
3. Review at least 35 charts from patients seen in the last 3-6 months and enter data using the secure online options provided
4. Review Practice Self-Assessment results
5. Review performance measure results (these are calculated for you)
6. Complete an Online Learning Log (to reflect and document your learning)
7. Review and select interventions for your action plan
8. Create your Action Plan and timeline to help you stay on track with your goals
9. Implement your Action Plan
10. Enter 10 charts for Stage B mid-point progress check
11. Review performance measure results
12. Complete mid-point Online Learning Log
13. Continue your Action Plan implementation
14. Complete a follow-up Practice Self-Assessment
15. Review at least 35 new patient charts from the last 3 months and enter data using the secure online options provided
16. Review your Practice Self-Assessment results and compare to your Stage A self-assessment results to identify changes
17. Review your performance measure results and compare to your Stage A results to identify changes
18. Complete the Online Learning Log and activity evaluation

The Smoking Cessation Module included the following measures:

1. **Ask about Tobacco Use**: Ask about tobacco use: Patient visits for patients aged 10 years and older where inquiry about tobacco use was recorded.

2. **Advise to Quit**: Advise tobacco users to quit: Patient visits for tobacco users aged 10 years and older where the act of advising the patient to quit tobacco use was recorded.
3. **Assist with Behavioral Plan:** Assist tobacco users who are willing to quit with a behavioral quit plan: Patients who are tobacco users aged 10 years and older where assistance with developing a behavioral quit plan was provided.

4. **Assist with Medication:** Assist tobacco smokers who are ready to quit by recommending medication use: Patient visits for tobacco smokers aged 18 years and older and where medication use was recommended to aid their quit plan.

5. **Motivate to Quit:** Provide tobacco users who are NOT ready to quit with motivational treatment: Patients who are tobacco users aged 10 years and older who were provided motivational treatment to quit tobacco use.

6. **Follow-up:** Arrange follow up for tobacco users attempting to quit: Patient visits for patients aged 10 years and older who are ready to quit using tobacco where a follow up was scheduled.

7. **Prevent Relapse:** Assist former tobacco users with relapse prevention: Patients who are former tobacco users aged 10 years and older where assistance with relapse prevention was provided.

The website disclosed that the activity was supported by an educational grant from Pfizer.

**ADHD Module**

The ADHD Module followed the same structure as the Obesity Module, but it focused only on follow-up visits for patients after an initial diagnosis of ADHD. The module followed the same initial assessment, implementation of an improvement plan and follow-up assessment. The intervention section included links to guidelines and other websites with information about ADHD, but did not include specific improvement
strategies. The measures included were:

1. **Follow-up Visit**: Percentage of patients who were initially diagnosed with ADHD who had a follow-up visit within 3 months of diagnosis.

2. **Patient Fails to Return**: Percentage of children who fail to return for initial follow-up visit

The website disclosed that the activity was supported by an educational grant from Ortho-McNeil-Janssen Pharmaceuticals, Inc.

**Procedure**

The three organizations that agreed to provide data all used the same technology platform to host their web-based modules. Physicians were responsible for entering data from the audit of their charts into the web-based modules hosted on the technology platform. Each module included chart audit forms where physicians would answer questions about the chart to enter the data into the system. These data are housed on a secure server and are kept as documentation of physicians' participation in the activity. The owners of the platform gave me access to their data reporting center which allowed me to create and run data reports that included the participant ID and the participant score for each measure from the Stage A and Stage C chart reviews. Reports were generated for the Smoking Cessation and ADHD Modules on December 5, 2012. These reports included all participants who completed the modules from their release dates until the date the report was generated. A report for the Obesity Module was generated on February 3, 2014 and includes all participants who completed the module from the release date until the date the report was generated. Only participants who completed both Stage A and
Stage C chart audits were included in the data analysis. Scores from Stage A and Stage C were matched using the unique participant ID number.

Stage A to Stage C differences in physician performance on each measure were assessed using paired t-tests. A significance level of <0.05 was used and all analyses were conducted using SAS version 9.3 (SAS Institute, Inc., Cary, NC).

**Results**

Data from 534 participants of the Smoking Cessation Module, 161 participants of the ADHD Module and 75 participants of the Obesity Module were included in the analysis. This included information on approximately 38,500 patients, 25-35 patients per participant in Stage A and 25-35 patients per provider in Stage C. As discussed in the introduction, participation numbers reported in the literature for Part IV modules has been relatively low ranging (only 6 to 79 participants). (Simpkins, et al., 2007) (Duffy, et al., 2008) (Caverzagie, et al., 2009) (Galliher, et al., 2014). The participants of the modules included in this study are similar to those seen in other Part IV projects. Table 3 shows the participation rates for each module.

<table>
<thead>
<tr>
<th>Module Topic</th>
<th>Number of physicians participating</th>
<th>Number of patient charts audited by physicians participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Cessation</td>
<td>534</td>
<td>~37,000</td>
</tr>
<tr>
<td>Obesity</td>
<td>75</td>
<td>~3,500</td>
</tr>
<tr>
<td>ADHD</td>
<td>161</td>
<td>~6,500</td>
</tr>
</tbody>
</table>

*Table 3: Participants of Modules*
Tables 4 shows Stage A (baseline) and Stage C (follow-up) results for each measure. Physicians demonstrated significant improvements in 27 of 31 measures after participating in one of the three web-based Part IV Modules. All measures showed improvement for the Smoking Cessation Module. Also the standard deviations for these measures were smaller in the Stage C results indicating performance across all participants was more homogenous after participating in the module.

Figures 8, 9, and 10 show bar graphs with Stage A and Stage C results side-by-side for each measure. Statistically significant results are indicated with asterisks. The largest improvements were seen in Relapse Prevention for Smoking Cessation (41.4 mean change (48.5 SD), \( p < .0001^* \)), Follow-up for Smoking Cessation (31.2 mean change (45.2 SD, \( p < .0001^* \)), and Waist Circumference Measurement for Obesity (29.0 mean change (38.9 SD), \( p < .00018^* \)).

Significant differences were not found for the following measures (all measures are part of the Obesity Module):

1. Weight Measured: 97.1% to 98.2%
   
   (1.1 mean change (7.8 SD), \( p = 0.2095 \))

2. Surgical Intervention: 19.1% to 23.7%
   
   (4.7 mean change (26.0 SD), \( p = 0.1657 \))

3. Hyperlipidemia Screening: 85.7% - 89.0%
   
   (3.3 mean change (14.7 SD), \( p = 0.0587 \))

4. Hypertension Screening: 91.8% - 94.5%
   
   (2.7 mean change (12.3 SD), \( p = 0.0654 \))
Though other data were collected by the modules that could have allowed for further analysis of possible confounding variables, the user agreements with participants would not allow for analysis of the data by third parties.
<table>
<thead>
<tr>
<th>PIM Title</th>
<th>Measure Title</th>
<th>N</th>
<th>Cycle 1: Mean (SD)</th>
<th>Cycle 3: Mean (SD)</th>
<th>Change from Cycle 1 to Cycle 3: Mean (SD)</th>
<th>Change from Cycle 1 to Cycle 3: t-test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD Module</td>
<td>Follow-up Visit</td>
<td>161</td>
<td>49.7 (29.3)</td>
<td>68.7 (28.5)</td>
<td>19.0 (29.0)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Patient Fails to Return</td>
<td>161</td>
<td>14.6 (16.0)</td>
<td>20.1 (21.9)</td>
<td>5.5 (24.3)</td>
<td>0.0050*</td>
</tr>
<tr>
<td>Smoking Cessation</td>
<td>Asked about Tobacco Use</td>
<td>534</td>
<td>65.9 (33.5)</td>
<td>94.2 (14.0)</td>
<td>28.3 (31.7)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>Module</td>
<td>Advise to Quit</td>
<td>464</td>
<td>67.0 (35.0)</td>
<td>94.3 (14.0)</td>
<td>27.2 (33.0)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Assist with Behavioral Plan</td>
<td>238</td>
<td>91.1 (24.9)</td>
<td>99.4 (4.8)</td>
<td>8.3 (25.6)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Assist with Medication</td>
<td>218</td>
<td>65.5 (41.0)</td>
<td>86.4 (25.5)</td>
<td>20.9 (44.0)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Motivate to Quit</td>
<td>316</td>
<td>87.1 (27.8)</td>
<td>97.0 (10.5)</td>
<td>9.9 (27.9)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>238</td>
<td>51.7 (44.7)</td>
<td>82.9 (32.2)</td>
<td>31.2 (45.2)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Relapse Prevention</td>
<td>164</td>
<td>50.0 (46.7)</td>
<td>91.5 (25.1)</td>
<td>41.4 (48.5)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>Obesity Module</td>
<td>BMI Documented</td>
<td>75</td>
<td>88.2 (28.9)</td>
<td>97.3 (11.3)</td>
<td>9.1 (26.2)</td>
<td>0.0036*</td>
</tr>
<tr>
<td></td>
<td>Waist Circumference</td>
<td>75</td>
<td>3.8 (17.1)</td>
<td>32.7 (41.3)</td>
<td>29.0 (38.9)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Weight Measured</td>
<td>75</td>
<td>97.1 (11.8)</td>
<td>98.2 (8.1)</td>
<td>1.1 (7.8)</td>
<td>0.2095</td>
</tr>
<tr>
<td></td>
<td>Weight Management Intervention</td>
<td>75</td>
<td>66.3 (32.9)</td>
<td>84.3 (24.7)</td>
<td>18.0 (28.7)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>a. Nutrition</td>
<td>75</td>
<td>53.6 (35.1)</td>
<td>76.4 (27.8)</td>
<td>22.8 (31.6)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>b. Physical Activity</td>
<td>75</td>
<td>58.1 (35.0)</td>
<td>77.7 (28.3)</td>
<td>19.6 (31.3)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>c. Lifestyle Changes</td>
<td>75</td>
<td>54.0 (36.7)</td>
<td>75.7 (29.8)</td>
<td>21.8 (31.2)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>d. Medication</td>
<td>75</td>
<td>12.6 (24.9)</td>
<td>21.0 (32.1)</td>
<td>8.4 (22.0)</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>e. Surgery</td>
<td>61</td>
<td>19.1 (28.3)</td>
<td>23.7 (32.2)</td>
<td>4.7 (26.0)</td>
<td>0.1657</td>
</tr>
<tr>
<td></td>
<td>Assessment of Motivation</td>
<td>75</td>
<td>50.6 (37.1)</td>
<td>78.2 (28.4)</td>
<td>27.7 (34.6)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Medication Review</td>
<td>75</td>
<td>62.6 (41.0)</td>
<td>84.5 (26.7)</td>
<td>21.9 (33.9)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>Side Effect</td>
<td>75</td>
<td>56.9 (42.3)</td>
<td>78.5 (32.0)</td>
<td>21.6 (33.0)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>All Comorbid Conditions considered</td>
<td>75</td>
<td>11.7 (27.9)</td>
<td>21.3 (34.9)</td>
<td>9.7 (27.6)</td>
<td>0.0034*</td>
</tr>
<tr>
<td></td>
<td>a. Diabetes</td>
<td>75</td>
<td>84.0 (24.6)</td>
<td>90.1 (22.8)</td>
<td>6.0 (19.5)</td>
<td>0.0091*</td>
</tr>
<tr>
<td></td>
<td>b. Hyperlipidemia</td>
<td>75</td>
<td>85.7 (23.0)</td>
<td>89.0 (22.1)</td>
<td>3.3 (14.7)</td>
<td>0.0587</td>
</tr>
<tr>
<td></td>
<td>c. Hypertension</td>
<td>75</td>
<td>91.8 (19.0)</td>
<td>94.5 (17.1)</td>
<td>2.7 (12.3)</td>
<td>0.0654</td>
</tr>
<tr>
<td></td>
<td>d. Metabolic Syndrome</td>
<td>75</td>
<td>53.4 (39.2)</td>
<td>68.1 (38.6)</td>
<td>14.8 (34.1)</td>
<td>0.0004*</td>
</tr>
<tr>
<td></td>
<td>e. Obstructive Sleep Apnea</td>
<td>75</td>
<td>38.9 (32.6)</td>
<td>52.1 (35.5)</td>
<td>13.2 (26.9)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>f. Osteoarthritis</td>
<td>75</td>
<td>50.4 (29.6)</td>
<td>65.5 (31.9)</td>
<td>15.1 (24.8)</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td></td>
<td>g. Polycystic ovarian Syndrome</td>
<td>74</td>
<td>26.9 (36.0)</td>
<td>39.5 (39.3)</td>
<td>12.6 (32.1)</td>
<td>0.0012*</td>
</tr>
<tr>
<td></td>
<td>h. Cushing's Disease</td>
<td>75</td>
<td>23.9 (36.3)</td>
<td>37.0 (42.6)</td>
<td>13.2 (34.0)</td>
<td>0.0013*</td>
</tr>
<tr>
<td></td>
<td>i. Hypothyroidism</td>
<td>75</td>
<td>60.3 (33.4)</td>
<td>73.0 (31.9)</td>
<td>12.7 (24.5)</td>
<td>&lt;0.0001*</td>
</tr>
</tbody>
</table>

* indicates statistically significant results
**ADHD Module**

![Bar graph showing compliance rates for ADHD Part IV Module](image)

*Figure 8: Mean Stage A (pre-) and Stage C (post-) compliance rates for ADHD Part IV Module*

**Smoking Cessation Module**

![Bar graph showing compliance rates for Smoking Cessation Part IV Module](image)

*Figure 9: Mean Stage A (pre-) and Stage C (post-) compliance rates for Smoking Cessation Part IV Module*
Figure 10: Mean Stage A (pre-) and Stage C (post-) compliance rates for Obesity Part IV Module
Methods and Results of Part II

Methods

Background

Data on performance analyzed in Part I of this study can tell only part of the story of the impact of these modules. As a practitioner, my goal was to discover participants' view of their experience of the modules. While there are many questions about these modules' ability to improve objective measures of physician performance, participation is still required for those who want or need to maintain their board certification. Though there are some studies that have started to investigate the impact of this new policy, the participants' voice is missing. As a result, this study is working to establish an initial investigation into participants' views of these modules.

I chose qualitative analysis because the purpose of my research is "to learn from the participants in a setting or process the way they experience [a phenomenon]" (Morse, 2002). Though I use thematic analysis to analyze my data, the type of research I performed is most closely related to a focused ethnography in that I am collecting information meant to elicit emic data (i.e., data from the view of the participants). According to Morse and Richards, focused ethnography "is used primarily to evaluate or elicit information on a special topic or shared experience" (Morse, 2002). It differs from traditional ethnography in that "the topic is specific and may be identified before the researcher commences the study" (Morse, 2002). In addition, Morse and Richards say that the "participants may not know each other, but the researcher focuses on their common behavior and experiences resulting from their shared features" (Morse, 2002).
Since my subjects have all participated in Part IV Modules, but in isolation, they have a shared experience, but they do not know each other nor do they have a shared environment. Also, I wanted to focus my studies on their interaction with these modules, which aligned best with focused ethnography.

In Morse and Richards work, they suggest that, for focused ethnography, “data making may include only some of the strategies that define ethnography” and specifically state that “data may consist only of interviews” (Morse, 2002). Because my focus is on the individual participant’s view and because the participant’s interaction with the module is limited and not an easily observable interaction, semi-structured interviews that focus on the particular experience of participating clinicians were used as the data-collection methodology.

Semi-structured interviews were used as opposed to surveys because this is a relative new area of research and I wanted to gather in-depth information in a relatively open way to encourage exploration of the range of possible experiences and to allow the experience of the participant to lead the discussion. I used a question guide to focus the interview on the participant’s experience in using the Part IV Modules and to remind participants of different aspects of the modules. Even though participation in the modules generally lasted over a few months, participants only spent a few hours over that time period participating in the module, therefore a semi-structured interview was warranted to allow for opportunities to prompt participants about their experience and keep them focused.
Recruitment

The convenience sampling procedure described in Part I of the study was used. This included participants of the Obesity and Smoking Cessation Modules who participated in Part I and also participants in a Breastfeeding Module, described below. A convenience sample was used because I was unable to collect data on other variables about participants that would allow for a meaningful purposive sampling. Also, since this is a new area of research, participant selection based on certain variables might exclude other participants who might have important contributions. Also, a random sampling method could not be used because all or even most randomly selected participants would be unlikely to participate in the study. As a result, all participants who completed the modules were invited to participate in the semi-structured interviews in the hope of having a sufficient sample to reach saturation in the data collected. Even though voluntary participation might lead to collection of data that were biased towards those who may have had a good experience and as a result wanted to discuss it, it was the only way to get a robust enough sample.

Email addresses were received from the organizations that created the modules. Emails informing participants of the study were sent to potential subjects. Two emails were sent, first in July and August of 2012 to participants who completed the Breastfeeding Module. Participants were interviewed in July, August and September of 2012. Two emails were sent in first November and then in December of 2012 to participants of the Smoking Cessation Module. Participants were interviewed in December of 2012 and January of 2013. Participants of the Obesity Module were
emailed as they completed the module. The recruitment information for this study was included in the email that notifies physicians that their participation in the module was reported to the American Board of Internal Medicine (Appendix B. “Participant Recruitment Email”). A drawing for a Kindle Fire was used as an incentive for participation.

*About the Modules*

Both the Obesity and Smoking Cessation Modules are described in Part I of this study. As described in Part I, the Breastfeeding Module could not be included in the quantitative portion of the study, but was able to be included in Part II. The Breastfeeding Module followed the same basic set up as the other modules described. Participants were asked to audit charts of 15 patients born in the last month. Measures included:

1. Skin-to-skin contact within 1 hour of delivery
2. Rooming-in for 23 hours or more per day
3. Breastfeeding assessment using objective tool
4. Pacifier use
5. Prenatal education
6. Infant latching to breast
7. Breastfeeding assessment every 8-10 hours

Like the other modules, after assessing practice in the initial chart review, participants were directed to read educational materials, participate in activities, or use recommended tools. They were expected to work on improvements in practice for a minimum of four
weeks. Participants were then asked to complete two follow-up audits of 10 charts each to determine the effectiveness of their interventions.

**Subjects**

For the module on Breastfeeding, I received contact information for 88 participants. A total of 13 participants responded. Three did not wish to participate. Two wanted to participate but because of scheduling conflicts, were not interviewed. Eight participants agreed to participate and were interviewed. For the Smoking Cessation Module, I received information on 369 participants. Twenty-three participants responded. One refused to participate. One wanted to participate but because of scheduling conflicts, was not interviewed. 21 participants agreed to participate and were interviewed. For the Obesity Module, I contacted 14 participants and 3 agreed to participate and were interviewed. A total of 32 participants were interviewed for the qualitative portion of this study.

<table>
<thead>
<tr>
<th>Module</th>
<th>Subjects Contacted</th>
<th>Subjects Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Cessation</td>
<td>369</td>
<td>21</td>
</tr>
<tr>
<td>Obesity</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>88</td>
<td>8</td>
</tr>
</tbody>
</table>

**Table 5: Participant information by module**

Note that the quantitative part of the study has more participants than the qualitative part. This is because the contact lists of participants for the qualitative portion of the study were received in 2012, while the data for the quantitative portion of the study were pulled
from the system in 2014 right before analysis to allow for the most participants to be included in that portion of the study.

**Procedure**

Subjects were called and interviewed about their experience with Part IV Modules. Interviews were 30 – 60 minutes in length. The interviews were semi-structured. I had a list of questions to ask, but also would ask follow-up questions about areas that the participant seemed to have interest in speaking about or in areas where I wanted to know more. The following question guide was used to collect similar data from all participants:

- **General Questions:**
  1. In what activity have you participated?
  2. Why did you choose that program?
  3. Did you know what you were getting into? Did you understand what would be required?
  4. Do you have any suggestions for improving the program?

- **General Questions about Expectations Before Participating:**
  5. What did you think was the goal of the project?
  6. Did you think this goal was important? Why or why not?
  7. Did you think this activity could accomplish that goal?
  8. Did you think if you put a lot of effort into this project that that would affect the accomplishment of the goals? Why or why not?
  9. What did you hope to accomplish through this program?

- **Questions about Stage A: Initial Chart Audit**
  10. What motivated you to complete the Chart Review?
  11. Was the Chart Review form useful/effective?
  12. How did you identify patients whose charts were to be reviewed?
  13. How did you pull the charts used for the chart review? Was pulling charts difficult?
  14. What were the results of the first chart audit?
  15. Did you discover gaps in practices?
  16. What were those gaps?
  17. Where you surprised? Why or why not?
  18. Did you share your data with anyone else? Why or why not?

- **Questions about Stage B: Intervention to Promote Improvement**
  19. Were their suggestions for improvement in the activity?
  20. What were they, were they helpful?
  21. Did you include someone else in the implementation of your interventions? Why or why not?
Questions about Stage C: Follow-up Chart Review:
22. Did you use the same technique to identify patients that you used in Stage A?
23. Did you think Stage C chat review was helpful?
24. Did you see changes in the data from Stage A to Stage C? If yes, what were the changes?
25. Did you achieve your goal for this program? Why or why not?
26. Would you participate in a program like this or use this process even if it was not required for MOC? Why or why not?

General Questions for Views After Completing the Program:
27. Did you enjoy the program? Why or why not?
28. Did you feel that you received any recognition for completing this program? Why or why not?
29. Did you feel any achievement in completing the program? Did it help you meet your personal goals as a physician? Why or why not?
30. Did you feel you had the power to make real change in your practice? Why or why not?
31. Did participating change your view about the value of such programs? Why or why not?
32. Did participating change your view about the ability of these types of programs to change practice? Why or why not?
33. Do you think the amount of effort you put into the program would influence the outcomes? Why or why not?

Each interview was recorded. After each interview I would type a brief outline of the interview and my initial thoughts about the interview. I would not take notes during the interview so that my full attention was on the conversation with the participant. Interviews were transcribed.

Because this is a new area of research and there is a need for a rich description of the data set, I chose to approach analyzing the data through thematic analysis (Braun, 2006) (Boyatzis, 1998). In this analysis, I chose to do an inductive analysis that codes the data “without trying to fit it into a pre-existing coding frame, or…analytic preconceptions” (Braun, 2006). Initially, I analyzed the data at a semantic level, where I progress from description to some interpretation in relation to previous literature.
To start, I selected a sample of 6 interviews to begin the reduction process. I decided to select two from each module because I wanted to ensure that I was initially looking at the experience of participants across the different modules. I thought by selecting interviews from the different modules, the common themes I would see would be more representative of the participation in web-based modules in general and not show the quirks of a particular web-based module.

I thought about trying to select participants based on other criteria. For example, I thought about looking for participants who were successful in implementing change versus those who were not successful. But, I thought it would be too difficult to define success. Since this area has not been studied much, a clear definition of success has not been created. While an article by Holmboe, et al., on a Part IV Module on Diabetes and another article by Olson, et al., on successful cases of a smoking cessation module both make attempts to define what success would mean (E. S. Holmboe, et al., 2006), (Curtis A. Olson, et al., 2011; C. A. Olson, et al., 2010). I wanted to leave this idea open so as not to prematurely classify a case as a success or failure based on what could ultimately be determined as an arbitrary definition.

I also thought I might separate participants based on their experience, possibly grouping those who had more positive versus those who had more negative things to say about the experience. However, most participants reported mixed feelings about participating and it was difficult to split the interviews in this way since there were both positive and negative experiences described by participants in most interviews. Also, I was concerned that since participants were volunteering for the study, a majority would
have more positive than negative opinions. I thought it was possible that participants who thought the modules were a complete waste of time would be less likely to participate in an interview.

To start the data reduction process, I chose six sample interviews and created an outline for each of the six interviews. For each module, I chose an interview from the beginning and end of the interviewing process so that the sample interviews would not be too influenced by where I was in my interviewing process. I wrote memos of ideas that occurred to me as I wrote each outline and wrote a summary after each session of outlining. For the outlines, I created headers based on what topics were discussed, for example, chart audit, or feelings about the requirement, or experience with QI. These topics sometimes closely reflected my interview questions and sometimes were very different depending on the interview.

After creating the outlines for the six sample interviews, I created lists of possible themes. I, then, uploaded the original interview transcripts in QSR International NVivo Version 10.0.268.0 SP3 (64-bit) to start the coding process. I used my initial codes from the outlining process to start the coding process. I also added codes as new themes emerged. After coding all of the interviews once, I created a new set of codes that specifically focused on the participants’ views of the impact that the modules had on them and their practice. I looked for any instance where the participant referred to how the module moved them into action (or not) and coded which part or what aspect of the module caused the impact and what was impacted.
The impact codes looked for themes of what was impacted by the modules. Table 6 shows each code and a description of that code.

<table>
<thead>
<tr>
<th>IMPACT CODES</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to improve</td>
<td>Module impacted participants’ views on how to improve practice</td>
</tr>
<tr>
<td>Revealed Gap</td>
<td>Module impacted participants’ views of their practice and revealed an area in need of improvement</td>
</tr>
<tr>
<td>View of requirement</td>
<td>Module impacted participants’ views about the MOC Part IV requirement in general</td>
</tr>
<tr>
<td>View of disease state</td>
<td>Module impacted participants’ views of the disease state and their role in managing patients with the disease or medical issue</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Module impacted participants’ knowledge and taught them some information they did not know before participating</td>
</tr>
<tr>
<td>View of QI</td>
<td>Module impacted participants view of quality improvement in general</td>
</tr>
<tr>
<td>Attitude</td>
<td>Module impacted participants attitude about the disease state or improvement process</td>
</tr>
<tr>
<td>Patient outcomes</td>
<td>Participants reported that changes made as a result of participating in the module had an impact on patients</td>
</tr>
<tr>
<td>Motivation</td>
<td>Module impacted participants’ motivation to do something whether that was to complete the module or improve performance</td>
</tr>
<tr>
<td>Practice</td>
<td>Module impacted participants’ practice</td>
</tr>
</tbody>
</table>

Table 6: Descriptions of codes used to identify what was impacted by the modules

Though there were some differences, each module followed the same basic steps that participants needed to complete. Another set of codes about these steps was created to reflect how the participants perceived these steps and not how the modules were actually set up. Table 7 includes each step and a description based on the information participants provided.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting</td>
<td>During the MOC process, participants learned about the Part IV requirement.</td>
</tr>
<tr>
<td>Selecting a Module</td>
<td>Participants had to see what options for meeting the Part IV requirement were available and then choose a module to meet the requirement.</td>
</tr>
<tr>
<td>Chart Audit (Initial)</td>
<td>Participants audited charts to determine their baseline performance rates on specific measures.</td>
</tr>
<tr>
<td>Education</td>
<td>Participants participated in educational activities as a part of all three modules.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Participants made improvements in practice based on their participation in the modules.</td>
</tr>
<tr>
<td>Chart Audit (Follow-up)</td>
<td>Participants audited charts to determine their follow-up performance rates on specific measures.</td>
</tr>
</tbody>
</table>

Table 7: Description of codes about each step in the modules

Results

*Basic Outcomes of Modules*

As described in the Introduction of this paper, the conceptual model developed by Moore, *et al.*, is widely used for assessing the outcomes of CME activities (Moore, *et al.*, 2009). The model describes 7 outcome levels as follows:

- **Level 1** Participation
- **Level 2** Satisfaction
- **Level 3A** Learning: Declarative Knowledge (Knows)
- **Level 3B** Learning: Procedural Knowledge (Knows How)
- **Level 4** Learning: Competence (Shows How)
- **Level 5** Performance (Does)
- **Level 6** Patient Health
- **Level 7** Community Health

As the prevailing model for assessing the outcomes of educational activities for physicians, this model can be used to assess the effectiveness of web-based Part IV Modules. In an article about the evolution of MOC, “the long-term goal [of MOC] must
be to get credit for improved outcomes associated with better patient care” (Miller, 2005).

On the ABMS website, it states that the Part IV requirement for MOC is meant to evaluate physicians:

...in their clinical practice according to specialty-specific standards for patient care. They are asked to demonstrate that they can assess the quality of care they provide compared to peers and national benchmarks and then apply the best evidence or consensus recommendations to improve that care using follow-up assessments ("American Board of Medical Specialties. The Specialty Board Movement,").

From these descriptions, ABMS is focusing on Level 5 outcomes, namely improvement of performance and looking towards the ultimate goal of improving patient health. Since Moore’s model is meant to demonstrate a sequential process toward higher levels of impact, it is helpful to evaluate an activity at all levels with the expectation that higher levels of impact can be reached when all earlier levels are satisfied.

Though this model is widely used, there are some limitations to just looking at the impact of these modules through this lens. As a result, discussion about the level will include other contributing factors.

**Level 1: Participation**

Level 1 measures participation. This refers to the number of physicians who participate in the activity. The model presents the idea that participation is an essential first step in impacting physician behavior and patient health through education. Since only completers were contacted, the data collected for this study cannot reasonably speak to the main questions about participation. However, one participant did discuss starting other modules and stopping them. “I had tried several but I thought it doesn’t fit [my practice]” (1137 L181). This shows that just because participation in Part IV is required, it
does not mean that physicians will automatically complete the first program they start. They may shop around and stop programs if there are too many barriers to completion or if, as in the case of this participant, the module does not fit their practice.

Also, even though some providers were very negative about the requirement and the process, no participant suggested they would not participate in the MOC process in the future because of this new requirement.

**Level 2: Satisfaction**

Level 2 measures satisfaction. While participants do not necessarily have to enjoy all aspects of a learning activity, the degree with which they are satisfied with the experience can impact their willingness to engage with what they learn and implement it into practice. The majority of participants did not like or agree with the new requirements when first starting the process. Participating in the module did help change some of the participants' views of the requirement, but others continued to find no value in the process.

Many participants had very negative attitudes about the requirement entering into the process. "I was skeptical to begin with so I can say I didn’t necessarily have the greatest attitude going into it" (I122, L473). Many talked about having to work to make the process meaningful, implying that the value would not come from simple participation. "So I evaluated the ones that were available on the American Board of Psychiatry and Neurology MOC Website, determined that this one appeared to be the best in terms of this is a giant waste of time; however, this particular one may actually be somewhat helpful" (I123, L120).
The modules were able to change some participants’ attitudes about the process. “I was definitely not for it. I just thought it was just a lot of time, energy wasted, but it actually did add value so, my thought after certainly different than before” (I137, L564). Another participant even went as far as saying it was “the most relevant aspect of my board recertification to what I actually do with my practice” (I114, L394). He thought that it was “more valuable [than the exam] because it directly impacted my practice” (I114, L404). Others said they learned something or that they were surprised to find value in the process. “I think I enjoyed it more than I thought I was going to” (I111, L428). “I think [the modules are a] good start for people to understand quality improvement” (I121, L868). “I felt like I learned something. As told you, I felt like ‘Okay, good, this wasn’t a complete waste of time’” (I137, L564).

There seem to be some factors that contributed to participants finding the process helpful. One participant who was very experienced in quality improvement was able to use participation in the module as an opportunity to improve the quality of care in an area in which he knew there were deficiencies and where there was alignment with other outside requirements. “It helps to satisfy a huge data point per collection for PQRS\(^2\) and so that really added relevance to why we are doing it. Other people bought into it because they understood it as well. So, the more relevance that people can put into designing practice and improvement modules, today, I think the better they’ll be received” (I114, L399). This participant was able to make changes that affected over 150

\(^2\) PQRS refers to the Physician Quality Reporting System. PQRS is a reporting program that uses a combination of incentive payments and payment adjustments to promote reporting of quality information by eligible professionals (EPs). (CMS, 2014) [http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/Index.html](http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/Index.html)
providers who work in the healthcare system in which he worked. He liked the module because it gave him the opportunity to focus on this area of his practice where he knew there was a gap. His experience with quality improvement and his position as a director allowed him to make system-wide changes that he felt were important.

Those who felt they were able to make changes in practice seemed to find the process valuable. “I’ve actually felt like it made an improvement in my ability to practice. I probably would go through it again. Yeah, I definitely think it was a benefit. And I’m glad I went through it” (I118, L365).

Others definitely did not find the experience helpful or valuable. One participant did not think that the module was specific enough to help her with her practice.

Overall, my feeling is that, if I was a pediatrician working at the hospital, so I’m like, “Okay, we really need a work on breastfeeding, and here’s what, there’s nothing going on. Here are some basic steps we need to take.” I think it would’ve been helpful, but I found it was a total waste of time because I feel like, okay, we’re already baby-friendly. (I122, L182)

She chose the Breastfeeding Module because she was in charge of improving breastfeeding in her hospital and it was an area they had been working toward improving for years. Even though they had made many improvements, there were still areas that needed improvement. So she thought participating in this module would allow her to continue the improvement process. Part of the problem was that her group had already made so many improvements that the module was not sophisticated enough to help her take her improvements to the next level. Since she had been working on improvements in her hospital for many years, she was experienced with quality improvement and with breastfeeding guidelines. She said the module was too basic for her. So even though she
had experience with quality improvement like the other participant who was able to use a module to make system-wide improvements, her experience with the topic area and her extensive improvement work that preceded her participation in the module made it difficult for the module to help her continue her improvement efforts. Therefore she was very unsatisfied with the process. The topic was very relevant, but the stage in her improvement process did not fit with the scope of the module.

Relevance was a major factor that influenced satisfaction with the modules. One participant said that he could not find a module that really fit his practice and felt that the requirement was good and quality improvement was important, but the development of Part IV Modules is in its infancy.

They don’t have in place, I think, an adequate number of meaningful experiences across all the subspecialties. I’m not -- I really don’t like the fact that they’ve created busy work for some of us. For somebody to end up doing some hand-washing thing, that’s busy work. That is meaningless busy work. I think that if you want something to be relevant -- if you want something to be good, it’s got to be relevant. It’s got to be authentic. It has to reflect the person’s clinical needs. I really think that they just are not there yet. (1130, L659)

This participant was hopeful that this process would be meaningful, but in the end, he could not find a module that fit his practice and therefore found the process to be a meaningless waste of time.

The relevancy of the module and the success to which the module was able to help the participant improve practice influenced the satisfaction of the participant. Also the ability to teach participants something new also influenced satisfaction. The next section will review learning elements of the modules and participants’ reactions.

*Learning 3A, 3B, and 4: Declarative and Procedural Knowledge and Competency*
Levels 3 and 4 pertain to learning. Gaps in knowledge is a major reason for gaps in practice (Cabana, et al., 1999). If participants learn what to do differently and how to do it, they are more likely to make a change in practice. Many participants stated that they did learn through the process of participating in the modules. Participants described learning specific facts they did not know before. "The drug interactions with smoking, I hadn't realized that there was such a large number of medications that interact with cigarettes and a lot of them are antiarrhythmic drugs, which are drugs that I use" (I124, 225).

A few reported learning about the quality improvement process.

But I have experienced the module. I've experienced the quality improvement project and so now I understand some of the processes because I've done it this way; this is another way to do it, like quality improvement projects. So it will impact the way I comment on things, the way I share ideas with my colleagues, the way we go about it in other things (I131, L586).

This participant learned about the quality improvement through participating in a module and talked about the fact that it might influence how she implemented other improvement projects. While many participants talked about what they learned, most of those discussions were directly related to change made in practice. When they would learn something new, they would discuss how that impacted their practice. The Level 5: Performance section gives examples of this, but when they were not able to apply what they learned, they would mention barriers.

I work in the emergency room and people who think they are having an emergency, who have one thing in mind that they want to get solved, what about fever, what about the fracture, what about the laceration, and what about the head injury and so between that and the pace in the emergency room, I think that my
ability to effectively employ smoking cessation cannot be as I have learned them. (1116, L607)

Despite learning something new and agreeing that it is important, the nature of his practice made it difficult for him to consistently implement what he had learned. Even with the barriers however, this participant appreciated learning something new and wanted to continue to work at improvement.

The module’s ability to teach participants something new not only influenced participants’ satisfaction with the module, but also moved them closer to the next step of changing their performance.

**Level 5: Performance**

Level 5 includes evaluation of changes in performance. While activities might look to change knowledge or competency, the true hope is that those changes will result in participants actually doing something different in practice. The type of changes in practice made by the participants varied. They ranged from physicians working to individually change their practice habits to changing electronic health records, infrastructure, or patient support for large-scale practice systems.

Those who attested to learning something new about elements of practice that were completely in their control were sometimes able to implement that into practice. This was particularly true for those who learned how to do something differently (competency).

I would pose it [to my patients] in a different way like I wouldn’t sit down with them and sort of set a goal or say like -- I would basically say, ‘Don’t wait and don’t delay it but start right away’ and now I learned that it makes sense to like really set a goal with them and have a certain date where that is meaningful to them and let them decide and let them sort of be in charge of it. (1126, L120)
This participant simply changed the way that she talked to her patients about quitting smoking. While before she used to tell them not to wait and start right away, she learned from the education that the evidence suggests having patients select a quit date that is meaningful to them is more effective. Since this change only involved her changing the way in which she spoke to patients about quitting smoking, she was able to improve her practice without involving others or elements of her system of practice. There were no systematic or supporting quality improvement techniques necessary for this type of change.

Another example comes from a participant of the Breastfeeding Module. Her main improvement was to change the way in which she presented information to patients, and did not necessitate a system- or practice-based change.

What I did most of the time, my patient would ask “What do you think about pacifiers?” I used to tell them it was not medically an issue but I started changing that statement. I would say, “You know, they said they could interfere with breastfeeding so if you don’t need to do it, don’t do it.” . . . The other thing’s supplementation. Lots of times, I had a mom that said, “I need to sleep, my baby -- I’m concerned about my baby not taking naps, what do I do? Should I supplement?” and you know, I make it the last resort now...[I used to say] “Of course you can. It’s not an issue” but I felt when I said that, it made them feel “oh, you could do it all the time and it would not interfere with breastfeeding” but I changed the way I said it. (L112, L358)

For these types of changes that focus on a knowledge gap, participants were able to make changes without including others or changing the system in which they worked. These participants recognized the importance of changing the way in which they communicated with their patients and since there were no significant external barriers to prevent them from changing their practice, they were able to make the improvement without using other quality improvement techniques. It was inside their control to change the way they
talked about these issues with patients.

Some of those who talked about changes in their own individual practice often discussed practice habits. Sometimes they just alluded to trying to create a new habit. “I made sure I asked them about smoking” (I130, L306). Others more explicitly referred to habits. “I just felt like I needed to discipline myself more to make sure I made it a priority” (I115, L116). These participants seem to learn about a gap in practice and try to remember to do something differently. They were either trying to break an old habit or trying to create a new habit or both. Either way, they did not include supporting quality improvement techniques in the implementation of this change in practice.

While some just tried to remember, others thought it would be hard for them to remember to continue the change in practice so they set up reminder system for themselves. “Well, instead of trying to remember to do this, I’ll just change the form” (I123, L497). Since this was a form he was already used to using, he trusted that this change would prompt him to remember. Another participant set up a low-tech reminder system. “The sticky on my computer says, ‘Don’t forget to ask about stop dates’” (I127, L303). While the former example was relatively permanent, the physicians in the latter example talked about not needing the reminder after a while. When asked if she was still using the sticky note she said, “Nope. I don’t. I’ve been doing pretty good at sustaining it...it was like I was doing pretty good. [I took it down] after I completed the second round of the chart audits and looked at the numbers and I felt like good!” (I127, L324).

In these two examples, the individual participants both used reminder systems, but one only used it while participating in the program, while the other made a change
that would last as long as the participant continued to use the same form.

Some participants felt it was important to make a process change. “I also knew that if we didn't make a process change, then the wheels are going to come off the wagon very soon. I knew that this was going to last a little while, but unless we made a process change, this wasn't going to stick” (1134 L461). This participant noted that a change in process would support an individual improvement that he wanted to make.

Some participants changed the patient education available or created plans that included the encouragement of self-management or patient reminder systems.

What I ended up doing was I created a folder of smoking cessation materials and I provided the materials to patients who are interested in smoking cessation and it had their readiness assessment...I even had and I'm not sure if this was part of the module or if I got it from somewhere else, but the four Ds and it was available on a very, very small—almost wallet-size—card that I ended up getting some laminating sheets and laminating copies of it with the four Ds. So, I said “Put this in your wallet just to remind yourself that when you want a cigarette, these four Ds are things that you can do.” (1129, L380)

This participant created a system for herself with the patient information folders to help systematize her changes in practice. For example, since readiness assessments are included in the folders, as well as patient education and a patient tool, she will not have to remember or to habituate the practice of assessing readiness, or remember which specific educational points to cover. The folders can act as a reminder to help her standardize her care. Also, the information was able to provide education to the patients and the laminated card was a tool to help remind patients of the skills they could use as they attempted quitting.

There was also discussion about changing documentation.
You learn things that you missed here and there and you tweak things and you – it helped me with my documentation. I had been discussing smoking cessation with patients before the start of the module. But the module gave me some ideas on how to address it more effectively and how to document more effectively. (I124, L194)

Though this participant alludes to real gaps in practice and the need to improve, she also talks about how documentation was an issue before the module and how the module helped her improve her documentation.

Some were able to make changes that were able to affect not only their own patients, but also the patients of other clinicians in their practices. “One thing that I was able to initiate is, start a group. For example, there are six mothers who are going to be discharged today, have a group lesson for every one of them explaining the benefits [of breastfeeding]...rather than simply go home” (I128, L154). The mothers being discharged are not all his patients, but he is still able to improve the care of all new mothers in his and his colleagues’ practices through the new group lesson.

Some participants included others in their action plans. This ranged from asking a nurse to help distribute new forms to making major system changes. “Well, we finally appointed a nurse educator...So basically the key thing was to identify one nurse who was going to act as a liaison between the others and also take up the role of educating everybody else” (128, L272). This participant said that a nurse educator was so important because many of nurses on staff did not know the latest evidence on breastfeeding and needed this basic education to enable the changes in practice to be implemented.

Other changes affected whole departments and even entire health care system.
Once I have made discoveries about what we should be doing differently at the treatment center, I implemented them across the board... For example, I changed the assessment forms and intake forms and the follow-up forms to ask questions that were the... to ask questions and to insert assessments that were the questions and assessments that were determined to be evidence-based. (1123, L184)

Another participant was the director of her department and was able to make substantial changes across her department.

The education part was like an eye-opener for everybody just showing how poorly we did. The first time I presented our data to the program, the program director was like, ‘I don’t see why we cannot do this.’ So, people were open to it. So, we started in each part and we had like three parts in the office. We had a champion, somebody who is for smoking cessation in that group in that part. So, every communication comes to that person in that part. The nurses need to ask every patient and document on the EMR and then, we develop with the IT people how to just include that on our EMR and have a place to check for smoking and so, it was documented. The nurses asked the questions on patients who are willing to quit or whatever. Even if they are not willing to quit, we still collect their names. The champion for each part takes spreadsheets of the patients and that’s truly before I left residency, we also from the smoke cessations group where we have patients coming. We started at every other month. So, every two months, patients were interested in the group. We call them or we send out letters three weeks before the time and we’ll meet with them and talk to them. So, it was more of patient -- staff education, patient education, implementing the smoke cessations checkbox on EMR so that they have a place to document it, having a champion in each part who follows up, and then forming a group session. (1125, L126)

Another participant oversees a large multi-site healthcare system with over 150 physicians over a few dozen sites. He was able to make changes that would affect the whole system.

So, [the Obesity Module] reflects to me like an opportunity to standardize what we do, sort of consider what the templates and specifically it matched up with our needs to use that as part of the PQRS system that we’re engaging in the second level for our maintenance program there. So, the administrator staff and IT staff are more than willing to help out to do this project. So, it made it an easy one to work out for everyone. (1114, L152)

His participation in the Obesity Module led to practice changes involving diagnosis of obesity and interventions and resources available across all sites.
Another participant changed positions in the middle of participating in the module and this affected her intervention.

Actually I had to sort of change my goals because near the end, I was in the position where I could then make more institutional changes versus more the personal changes where I now have the authority and the power in the position to make these other changes needed. The entire process was very much eye-opening, enlightening not only for me personally but also just opened my eyes to what my patients were going through. I started recognizing things such as some really obese patients would come in and stand. They wouldn’t sit and they wouldn’t sit because we didn’t have the chairs in any of our facility that would accommodate them. (1137, L303)

This participants’ position in her practice directly influenced the type of change she was able to make in practice. While before she was a practicing clinician with less than 10% administrative time, now she was an administrator who oversees 42 centers. Her changes before the promotion focused on her individual effort to speak to her patients about their weight more often. After the promotion, she was able to order new equipment, like scales with higher weight capacities, larger robes, and chairs without armrests for the waiting room. Because of her promotion, she was able to focus on the system in which she practiced as opposed to just her individual practice.

This issue of the system changes versus the individual change was apparent in a few interviews. The examples above showcase how some physicians saw this as an opportunity to improve practice system-wide and wanted to engage others in the process, while others focused on their own practice or their own practice habits.

One participant said that MOC was a “private matter” (1127, L298) and she did not want to include others in the process. When asked if she thought about having her employer involved in using an internal quality improvement project to meet the requirements for MOC, she was against that idea.
I think that's crossing boundaries and I don't think [my employer] needs to be in that business...I really think that your survival in this world as a physician is your ability to keep your licensure and to be able to practice to provide food, clothing, and shelter for yourself and your family...I really don’t think getting your employer involved in your survival mechanisms is necessarily a good thing. (1127, L408)

This participant's comments underscore a need for these web-based modules so that physicians can participate in MOC on their own. Others did not have the opportunity to make changes beyond their own practice. For one participant, when asked if she thought her changes could be sustained, she said she was not sure because she did not have support in the changes she was making.

I felt like I could do it for a while but I wasn’t sure if it would stick and I still see the problem that it may not...you know, because most of the work I’m still doing. It’s not like 'Yeah there’s, in the practice, they’re [all] participating’ except for one person...If I was a partner in the office that would probably change things...I’m employed, you know. Yeah. So there’s a little bit of limitation to what you can do. (126, L564)

She would have welcomed the opportunity to have others be involved, but since this was an individual process and she was not in a leadership position in her practice, she could not include others.

**Level 6 and 7: Patient and Population Health**

Since participating in the modules is an MOC requirement, the focus is understandably on performance of the physician rather than patient outcomes. The hope is that by improving physicians’ performance in their compliance with evidence-based practices, the result will be improved patient health. However, the type of data that are collected for the modules makes it difficult for participants to objectively know if the program resulted in improved health. There are a few problems with trying to collect patient health data for these programs. First, the modules in this study do not use patient health
measures. Even the measures that focus on the patient look at patient behaviors, i.e. whether or not they are smokers, whether or not the patient is breastfed, whether or not the patient is losing weight, and do not reflect actual patient health outcomes. Though these are proven behaviors for better health, these measures do not look at a decrease in lung cancer (which would be the hope if people quit smoking), or healthier kids after breastfeeding (which would be the hope if more children were breastfed). Second, even if these data were collected, the time it takes to see these types of health outcomes is beyond the scope of the modules. Even if physicians develop their own systems to follow performance on measures, these results would not be seen for years. Also, data collected at the beginning and at the end of the program are not on the same patients. Even though the 25 charts required for most MOC Part IV modules are supposed to be a representative sample of the physicians’ performance, they are not necessarily representative of the patient population.

Despite these issues about determining impact on patient health, a few providers offered some anecdotal evidence of improvements in patient behaviors.

Well, I think my quit rates are higher. I mean, my quit rates are higher. I think it's really working. I think I have a much better understanding of what's really going on...I did have anecdotal great successes with smoking cessation lately which I didn't have before...I had a husband and wife who came to see me, and I just heard from their daughter...that I was like the tenth doctor they saw and because after the visit they both quit...They said, "No other doctors managed to convince them to quit smoking." (1134, L403).

This participant seems confident that he has seen improvements in patients’ behavior. When asked how he knows, this participant could only offer other anecdotal examples and did not have data to back up his confidence. Though there are no objective data to back up these examples, these initial anecdotes help reinforce his new behaviors and may
help him continue this new practice. Many participants had similar answers, and named particular examples of patients that quit smoking, lost weight, or breastfed babies. But none offered data to support these stories of improvement.

Even though, the data currently collected for these modules would not show an impact on patient health, some participants did feel that there was some impact on their patients’ health and thus this impacted physicians’ confidence in the changes they made.

**Modules Impact on Motivation**

Participants’ interaction with this new requirement was mixed. Though the modules are designed to guide clinicians through a process meant to improve their practice, participants described factors about the modules that influenced their motivation as they completed the process. The overarching theme of their source of motivation to go through each step of the module was to meet the requirement for MOC, yet completion was not the only goal. Though some aspects of the process narrowed their motivation to focus on just meeting the requirement regardless of the impact on their performance or patient health, other aspects broadened their reason for participation to include these goals.

Participants’ motivation changed as they went through each step of the process from initially learning about the requirement, to selecting a module, and then completing each step of the module itself. Each step had factors that helped participants internalize the goals of Part IV Modules, namely participating in quality improvement and improving performance and patient care. While the need to meet the requirement motivated most participants to complete the modules, there are certain aspects of the
modules, like the education and the intervention steps, that enhanced their motivation to include goals other than just completion and helped them to focus more broadly on the overall goals of improving their performance and patient care. Other aspects of the program caused participants' goals to narrow to focus only on completion.

Figure 11 depicts the changing nature of participants' motivation as they go through each step of the programs. It shows how participants' goals narrow to focus more on completion at some points of the modules and broaden to include other factors at other points. Elements of the modules contribute to this narrowing and broadening of goals. The following section describes each step of the program and the effect on motivation.
Figure 11: Force Field Analysis of Motivating and Demotivating Factors of web-based Part IV Modules

Starting (Initial Interaction with Requirement)

29 out of the 32 subjects interviewed said they participated in the module because they needed to meet the requirement for MOC for their Specialty Board. These participants generally used their certifying boards’ website to read about all the requirements of the MOC process and first learned about the Part IV requirement from these websites. Others heard some explanation from colleagues about the process, but learned more from the websites.

When asked why they participated, some just answered with a simple statement about the fact that the module satisfied the MOC requirement, like, “I just want to satisfy..."
the requirement” (I121, L132). Many of these participants' sources of motivation were
the external regulation of the requirements of board certification and did not think that the
process of going through the module would be valuable. Five participants mentioned that
the requirement was just another way for the Boards to make money. “It is viewed by
most physicians, myself included, as a mechanism essentially for earning money for the
board” (I123, L104). Two mentioned the specific salaries that the heads of the boards
make. One said, “The president of the American Board of Psychiatry tied to Neurology
earns $450,000 a year. That salary is made by our participation” (I123, L227). There
was a sense of anger and resentment. “I mean like every time you turn around, there's
another fee involved with keeping your credentials current” (I124, L497). Since these
participants’ perceptions about the reason for the requirement were simply to make
money, they were not motivated to do more than pay the fee and get the module done.
These perceptions narrowed participants’ goals to focus only on completion and not the
larger purpose to improve performance and patient care.

While some participants’ focus on the requirement ebbed and flowed as they
discussed the module, one participant repeatedly used language about requirements
whenever asked how she interacted with the modules. When asked if she shared the data
with anyone else she asked, “Was I supposed to?” (I117, L270). When asked why she did
not, she said, “I was doing it because I had to” and saw it as a “check box that needs to be
done” (I117, L497). When asked what would make the process better she said:

I'd have to be brave enough to choose something that I'm not comfortable with,
okay. So tobacco is something I'm comfortable with. And so I should, for me, it
would probably be... Let's see what can I do? It would be one on developmental
screening, something that is not one of my fortes (I117, L571).
Because her focus was purely on meeting the requirement, she chose a module with a topic area with which she was comfortable so she could just get the module done. Initially she could not see beyond the requirement to find any meaning in the process and her choice of modules then set her up to continue to focus on her main goal of completing the module to satisfy the requirement.

Others could not see how the modules could achieve their goals of improving performance or patient outcomes. “What I would say is that a couple page survey as a part of an MOC requirement will never achieve the goal of measuring physician performance” (1123, L402). This participant understood that the goal of the modules are to improve performance and he also thought that was an important goal, but he did not think that the modules were even capable of assessing practice, never mind the larger goal of improving it. As a result, his motivation going into the process was just to do what was necessary to meet the requirement.

Of the three who did not initially participate in the program for MOC, one discovered after starting the module that it would count toward MOC. He stated that he thought he would have completed the module regardless but that this was a nice bonus. All participants who did not participate because of MOC recognized a need for improvement in the care of the patients in the topic area of the modules. They felt a strong need to do something to make an improvement and cited that as the reason for participating. “I’ve got three kids and they’ve all smoked at some point. So, I know how difficult it is to stop just from hearing them and trying to help them quit smoking and I know how hard it is to stop smoking from what I’ve seen and from hearing from patients”
For these participants, completion was not a goal; improving patient care was the goal. So, their goal to improve aligned with the goals of the module and they were hopeful that participating would achieve that goal.

**Selecting Module**

Through the selection of the module many participants were looking for something meaningful. Some talked about the requirement as the impetus for starting the process, but then mentioned other factors that influenced the type of motivation they were experiencing when selecting a module. There was a broadening of goals that went beyond just completion. One participant was determined to make the process meaningful. When referring to the fact that a colleague suggested doing a Part IV module on hand washing because it was the easiest, she said, “So I wanted something that was -- if I was going to take the time to do it, I wanted it to be meaningful. I mean I didn’t want to -- I really didn’t want to do this hand washing thing just to get it out of the way” (I130, L152). She saw the module selection process as her first opportunity to make the process meaningful for her. The autonomy that she felt in the selection process contributed to her ability to broaden her goals beyond completion.

Others discussed personal connections to the topic that they choose; “I just feel pain seeing patients who continue to smoke, which does a lot of harm to their body and I know that if they can stop smoking, it would help them a lot” (I124, L164). Or the program fills a perceived need for improvement; “As a matter of fact, when I went through the modules, the opportunity to look through I kind of scanned down and I got about half way through and I saw the obesity one and I knew that that was the right one
to do because I was frustrated about all the time I spent working with people and not being able to document my time and effort” (I114, L227). Or the module aligned with another project; “I knew I would have to do something [for MOC]. And then the Meaningful Use issue came along, and [the MOC module] solved the problem” (I134, L297). Or the topic was relevant to their practice; “I mean, it is something obviously germane to what I do all day every day” (I121, L113).

Whatever the topic of the module, identification with that topic helped participants internalize the goals of the modules and helped them work towards improvement in those areas. Interestingly, no participant mentioned identification with the quality improvement process in general even though a few had extensive experience in quality improvement. The focus was on the topics specifically.

One participant did mention a connection to the institution that created the module and as a result he felt that the organization would produce a “high quality” module (I136 L.74). Others mentioned the description of the modules requirements. One participant looked for a module that did not have a patient or colleague survey component because he felt that patients and referring doctors who use him like him and the comments would not be useful (I134, L124). He looked at what was required and avoided modules that had requirements he did not think were useful.

While choosing a module, some participants were able to internalize the process and became more engaged. Others, however, could not find modules that were relevant to their practice and therefore had to settle on an experience that was less meaningful. Additionally, program components, reputation of the creator of the module, and
perceived gap in practice all played a role in participants’ select process. Though it was not true for everyone, the autonomy gained through the selection process did motivate some participants to broaden their goals in participation from simply meeting the MOC requirement to improving performance and patient health.

**Chart Audit (Initial)**

The majority of participants responded negatively to the chart review process. They had trouble with the logistics of completing the chart review, considered it busy work, and/or had issues with the relevancy and importance of the data in which they were collecting.

Participants described logistical issues, like trouble finding patients who met the denominator criteria because of “antiquated medical record system” or frustration with the module interface. Four participants said chart review process was “tedious” (I119, 134, 130, 137). Four participants described it as “busy work” (I111, 123, 130, 134).

Seven participants talked about issues of documentation. One said documentation was “stingy” (I128, L163), claiming that the details included in the chart were sparse and, therefore, he found it difficult to find the information he needed to do the review. Others said they did not need to audit the number of charts required to notice obvious gaps in practice. “It was not helpful in the sense that I knew I never talked to anybody about smoking. [laughter] I did not need to do a chart audit to say ‘gosh, I wonder if I do as well as I think I do’” (I128, L410). Or they saw patterns with fewer charts. “I thought after a while it became a little bit redundant and it didn’t take that long to figure out that there was a pattern here about things I did and didn’t do” (I114, L370). Or when a chart
audit question focused on a system issue, they did not need to audit specific patients to
find out whether or not something was being done. “You could even make it less patient-
oriented, but this is a system issue and it could have been a system question” (I122, L364).

Others complained about the relevancy of certain questions, particularly questions
that asked about issues outside their scope of practice. For example, in the breastfeeding
module, there were questions about practices in the hospital and follow-up that happens
after the patient leaves the hospital. A participant who worked at the hospital said there
was no way for her to know what happens after the patient was discharged. While a
primary care provider had limited knowledge and influence over policies at the hospitals.
“They asked me questions about when the mother is first born [sic] and we had nothing to
do with what happens in the hospital until actually we see the patient” (I119, L51). “I
don’t know what their policies are. And I go to eight different hospitals to see newborns”
(I121, L290).

Others didn’t agree with some of the questions or the measures. One physician
who works with a rural, underserved population said that the measures “are important but
the standards are quite high, not practical in every setting” (I128, L114). This indicates
that different settings might have different standards. The presence of certain barriers
may mean that a higher standard of care may not be possible. Another physician just
disagreed with a measure saying, “I didn’t also agree with everything they asked, so for
example I don’t think in fact giving a pacifier early on is such a... is a bad thing” (I119,
L83). While the latter example may indicate the need for further education about why the
standards were used and the evidence behind the standards, the former example may be an indication of a need for further specification in these modules to take into account the specific barriers that a provider faces and tailor the measures to meet the participants’ exact needs.

While in general participants had many negative things to say about the chart audit process, some participants did note some positive outcomes of the chart audit process. Conducting the chart audit allowed some participants to become emotionally engaged with the modules. Whether they realized they were not providing standard of care to a patient they knew well, or they were embarrassed by not scoring as well as their colleagues, the chart review process and/or the resulting data feedback motivated physicians to improve practice.

The chart audit process, more than just looking at the data, had a unique ability of tapping into the physician-patient relationship. “When I miss something on a patient, that’s my biggest quality improvement, for me, because it is so tangible and it’s not evidence-based and it’s very anecdotal but it does change my behavior” (I117, L523). Even though this one participant did say that the chart review was not helpful because she was doing well in the topic area, she said that if she were not doing well, it would have been powerful.

I think the doctor-patient relationship is so powerful and that kind of loyalty to your patient that you want to do the best thing and so when either you see that you’re not doing the best either because compared to your peers or something else happened because you didn’t do something, that’s incredibly powerful. (I117, L546)
Another participant talked about the general emotion he felt when looking at patients’ records. “I just remember the emotional feeling of being like, ‘Wow, hmm.’ I don’t talk to them enough or I don’t, you know, offer them the nicotine patches as much as I should, as much as I think I am” (1131, L252). The chart audit process gave a face and a name to the gaps in practice the data revealed. Another participant talked about how the chart audit made the data more personal.

I think maybe for this particular study actually having the individual patient in mind and then thinking about what I did or didn’t do...is probably a little bit more, for me personally, just had more of an impact...I think putting the actual individual patients with those questions maybe kind of makes it more personal. These are my actual patients that I’m seeing, someone [sic] that I’ve been seeing for several years. I’ve known them pretty well. And so in that way I think they’re more emotionally compelling. (1136, L356)

This emotional engagement provided a motivator for some to move beyond the requirement and focus on improvement.

Another way the modules engaged the emotions of participants was through data comparison with other providers. Although participants can participate in some Part IV modules as a group, this is not a requirement. The board certification process has been focused on the individual physician even before it evolved into MOC. One of the purposes of the web-based modules is to enable participants to complete the requirement on their own and within their own MOC cycle.

Even though most physicians interviewed participated alone, one participant did participate in the module with a colleague. They decided to participate together to support each other as they went through the MOC process. Even though they did not practice together, they still were able to figure out the requirements for MOC and work
through each one together. As a result of participating with her colleague, this participant said she was embarrassed when her data showed significantly more gaps than her colleague’s data. “It was embarrassing. Like I said, I knew I wasn't doing a good job at it and I was comparing notes with my friend who -- that's what she did for a living. I had to kind of show her what I wasn't doing” (I134, L128). She described that feeling as a motivating factor. It was not that they shared a practice and could improve systems together, but rather the mere comparison of her data with her friend’s caused the feelings of embarrassment and then motivated her to change.

Another participant thought that the feedback that the modules provided that compared his compliance rates with those of other participants was powerful. “I think it makes you change because you’re keying in to the person’s pride in the sense of wanting to look good at being scored” (I127, L373). By tapping into this emotional response, the module was able to motivate this participant to make changes in practice.

Also, even though most participants complained about the redundancy of the chart audit process, one participant found that to be impactful. “I knew I didn’t do it well and this just proved it. Does it take thirty charts to do that? Not really, but it’s still -- I think seeing it happen over and over and over and over where here’s one that -- you could have impacted it” (I129, L344). While the repetition of the process was not seen as helpful from the standpoint of assessing performance, the emotional impact did help drive home a need for change and improvement.

While the emotional aspect of the chart audit was important to some, so were the actual data. For these participants, they either did not have an accurate perception of
their practice, or the data validated what they thought might be happening.

I mean, compared to what the goals were, the national averages to where we were, there was a big difference. Until we started looking into what our numbers are, we thought we were doing okay. Yeah, x number are doing basically yes. But once we actually looked into the hard data, the numbers were really crappy. (I128, L189)

The chart audit process was able to impact some participants’ view of their performance. One participant said, “It was very helpful. It's not something I usually do so, I think, it is very telling, right, you know, my perception of what I do versus what am I really doing” (I131, L242). Others talked about suspecting a gap in practice and how the data validated those feelings. “I think it validated my sort of gut feeling about the fact that I really wasn’t doing much” (I129, L330).

While those that discussed the value of the chart audit in terms of understanding gaps in practice, there was an element in the auditing process that seemed to elicit an emotional response. When asked if a report from electronic health records or another database system would have led to the same results, one participant said, “I would have thought the upload missed it. So looking at myself was of value” (L1134, L226).

Another participant saw it as a way to look at their patients more closely.

I enjoyed it because it did get me sort of to look at patient charts a little more closely and look at their habits, sort of the social history or something that we do on a routine basis, but then, it becomes very routine. So, really looking at patients identifying yes or no, they smoke or they don’t smoke and then, going into the how much and for how long and getting a little bit more depth to that. I found that really interesting. (I129, L134)

Another participant, who claimed to know he never talked about smoking with his patient (he is an emergency physician and did not see it as his place to handle smoking cessation), stated that the chart review was helpful because he began to see what the other
providers around him were doing with these patients. “I started to realize that -- that some of them were doing smoking cessation education with -- with patients that I have seen and -- but we have not talked about it together, particularly the family practice residents” (I116, L419). From the chart review he was able to see how the system in which he worked contributed to the treatment of his patients. This was something he was not aware was happening and reinforced for him the idea that he should try to address smoking cessation even in his setting. Without seeing that, he might have continued to believe that the barriers in his setting would make it impossible and even inappropriate for him to improve practice in this area.

**Education**

The opportunity for education was a motivator for participants. Many participants sited learning more about a topic as a primary reason of choosing a module. “I could gain some knowledge” (I21, L137); “I needed to fresh up my knowledge” (I28, L87); “so I looked to find one that would teach me something more than I already knew” (I30, L157).

Participants liked the education that was offered with the modules, particularly the Smoking Cessation Module. “The educational videos were very good. The educational tips of how to deal with smoking cessation, I thought were very, very good” (I34, L183). “I personally learned probably the most from was the videos they made me go through” (I26, L227).

Some thought that the education was the only good part of the process.

I don’t think that that activity that sort of iterative process [meaning auditing the charts, implementing an improvement and auditing the
charts again), I don’t think it’s what fundamentally drove my improvement in practice. I think what drove my improvement in practice was I learned stuff that was taught to me through the readings and the videos of how to make people quit smoking eventually. (I123, L263)

This participant said that he felt the modules themselves would not motivate people to improve practice. It was the education that motivated him to change his practice. A similar idea was discussed by another participant who felt that process of looking at data was not necessary.

So, I guess, without having this structure of the [Smoking Cessation Module] where you looked at the charts, did some of the intervention and then looked to see how the intervention, you know, affected my practice, without that whole piece, thing called quality, I feel like we’re striving for better improved quality constantly without just having this science behind it. (I131 L568)

This participant does not see the quality improvement strategies as important. She said that through education she was able to improve and the data were just proving it to the boards and not motivating to improve practice.

It helped changed participants attitudes about the topic area. One participant said that he never talked about smoking with his patients because he himself had loved to smoke and he felt as an emergency medicine physician, he could not make an impact in such a short interaction with patients. He reported that the education “really started to convince” (I116, L397) him that it was appropriate for him to intervene for patients who smoke. Also, he talked about how the interview as a part of this study was, for him, another intervention in his process of improvement. This shows how change is a journey and the possible impact of these programs should not be viewed in isolation, but as a part of a larger improvement process.

Though the education was helpful for most, others said the education was either
not specific enough to motivate them to improve their practice or that it did not include any new information that they did not already know. One participant, who had extensive experience in working toward improving the quality of breastfeeding procedures and policies at her hospital, said that the resources available were not helpful. “If you read the WHO report on breastfeeding, it’s useful information, but it really doesn’t give me the tools to improve breastfeeding in my hospital” (I122, L300). She said the tools were not specific enough. She said it would have been useful to see “specific tools that I can talk about with my nursing team to try to get that to happen. So it just wasn’t specific enough. In this age, who doesn’t know breastfeeding is great and what hospitals aren’t trying to encourage breastfeeding?” (I122, L335).

Another participant talked about how the education built upon the practice audit and helped him to recognize gaps in practice and then motivated him to do something about it.

So, that was easy enough I mean just have an idea in my head what specifically to do and then the educational materials kind of facilitated that and gave me a better idea how I go about it. How I could approach it. What kind of thing that I can offer. If a patient shows interest in quitting smoking we had to capitalize on that you know what do I immediately offer and how do I encourage them to set it with a date and actually act on it and do the right things. That all came from the educational materials but just knowing that there is some kind of a deficit in the self survey. (I136, L473)

For this participant it was both the education, which showed him what to do, and the chart audit, which showed him his gap in practice, that motivated him to improve. It was not enough to know there was a gap, but also he needed to know what to do about that gap in order to be moved to improve. This shows how education motivates participants to change.
**Intervention**

Though some participants did talk about using handouts or education tools, no participant mentioned learning a particular intervention technique and using that to change practice. There was no mention of learning about a technique to improve practice, like process mapping, or reminder systems, and implementing their change in practice through these quality improvement mechanisms. While the modules seemed to be pushing providers to make changes in practice, the participants did not discuss receiving any ideas for improving practice systems through the modules. This might indicate a gap in the curriculum of these modules. So besides the program elements that led up to the intervention section, there seemed to be no particular factor in the intervention sections of these modules that motivated change.

However, the expectation that they would have to make a change in practice was motivating. When one participant was asked if she made a change in practice, she said, “Yes, because it was part of the module” (1111, L227). The fact that it was part of the requirement meant that she was going to at least attempt a change. Though a majority of participants did not use quality improvement strategies to support their changes in practice, they did recognize that they needed to change the way they practice simply because this section of the module existed. The expectation of improvement, not necessarily a requirement, was motivation enough.

In addition, many participants thought the fact that they were required to participate also meant they were required to show improvement. Even though this was
not the case, participants did talk about having the improvement effort on the forefront of their minds.

I thought it went well because I had it ever present in my mind the whole time that throughout the months that I was going through that as "Okay, you need this to look good." (I127 L363)

The fact that participation was required for some meant improvement was required and that motivated them to change practice.

*Chart Audit (Follow-up)*

Many thought the follow-up chart audit was not helpful. "I got the impression that I knew that I was doing that without having to go back and look" (I123, L626). Like many others, this participant did not see the value in looking at another set of charts. He thought he knew what the data would tell him and therefore was not motivated to finish the improvement cycle.

He did not take the chart audit process that seriously.

It was important to be honest but I viewed this essentially as grunt work or busy work such as meeting this requirement...so it's possible that I may have been somewhat dismissive, if you will, of the questions. I don't know quite how to phrase that except to say that you've probably taken surveys were you have fatigue and then answers D for all of the answers...I don't know that I necessarily did that but I would guess that there might be some drift in that direction possibly. (I123, L632)

This quote shows that because he did not see value in the follow-up chart audit process, the data gathered might not be representative of his practice. He was not motivated to complete the quality improvement process with the same level of rigor as his initial chart audit.
Another saw it not as a learning opportunity, but something that had to be done to prove to the boards that she was making improvement.

Well okay so this was basically making me prove it and I am doing a lot of quality improvement at my hospital but it’s... I am not like keeping diligent numbers on it. But I continually... I am looking for ways that we need to improve in changing our practice so that it is improved quality. But I have not done much in a way of documenting, you know, we were this percent before, now we’re this percent. I have been more just focused on making sure that what we’re actually doing for the patient what is the highest level of care. (I111, L142)

This participant sees herself as improving her practice all the time without data. Later in her interview she reluctantly admitted that you need data to know if you are actually making an improvement. However, the time it takes to collect and analyze the data is a barrier for her to regularly look at data to “prove” the improvement.

I think that unless you double check your data you can’t be sure that you are doing it...I do plan to continue to work on quality improvement whether or not it’s demanded of me because it’s the right thing to do. But how much time I will put into getting very specific about my statistics I don’t know unless it is required of me because I don’t feel like that adds that much directly except that, you know, I have recognized a little bit more that I do have to at least make sure that it doesn’t just feel like it’s working that there is actually some evidence that it’s working. (I111, L417)

This participant did not see the follow-up data as important to her process of improving practice. It was not a motivating factor. She did eventually reluctantly admit that she needs the follow-up data to know if her improvements are working. However, since she does not have the time to collect and analyze data, she says she does not feel that it is valuable. There is this tension for her between the need for data to show the results of changes in practice and the time and effort needed to collect these data that makes her question the value of the process.
One participant thought the follow-up helped show that his improvement was not working as well as he thought.

I can remember looking back and saying alright well I did something but you know how everybody -- everybody thinks they are more generous than they are and then sit down with someone with their check book and they say, see you are not as generous as you think and well yeah, the same thing; I thought I was doing better than I was...I looked at the chart review, it is like alright so I am aware and I have made some changes but this is really not the kind of improvement that I would hope for. So that was disappointing. (1116, L539)

He is still working on improving and his follow-up chart review further motivated these changes in practice.

Others saw the follow-up audit as an opportunity for further improvement. “It was nice to go back and see where we’ve improved and where we still need to do more work” (1125, L266); “It just helped me to refocus, rethink about my practice again” (1137, L551).

Another talked about how the fact that she knew the follow-up chart review was going to happen made her focus on making changes in practice. “Well, I thought to myself I already know that I’m going to be surveyed later on...so, I definitely want to try to work on these things so that my follow up surveys look a lot better than my first survey. I mean why do quality improvement if you don’t really improve anything?” (1136, L486).

The follow-up chart review motivated some to make sure their changes in practice would lead to improvement and gave others the opportunity to assess the effectiveness of their changes and identify other areas for improvement. Others, however, did not find
any value in the follow-up chart audit process and this may even affect the accuracy of
the data collected in this part of the module.

Discussion

Outcomes

The implementation of the Part IV requirement for MOC has happened even though there
is little evidence of these programs' effectiveness in meeting their goals to have
physicians participate in quality improvement to help them improve performance or
patient care. The results of the data analysis presented in the quantitative portion of this
study are limited, but promising. Data from chart audits suggest that there are
improvements in practice as a result of participation. Though there are many
shortcomings in these data that will be described more in the “Limitations” section, if the
data did not show any improvement, this would highlight an immediate need to question
the policy and/or how it is being implemented.

Four measures did not show improvement. Three of these measures: measuring
weight, screening patients for hyperlipidemia and screening for hypertension, had high
baseline compliance rates of over 85%, which indicate the possibility of a ceiling effect
where there was not much room for improvement. The fourth measure, which looked at
the percentage of patients who received counseling about surgery for weight loss, only
included patients who are severely obese. Since participants each only had 1 or 2 patients
that fit into this category, the number of patients included in the denominator of this
measure was so few that the low compliance rates may mean only one missed
opportunity. Therefore the sample size for each participant might not be large enough to offer meaningful data.

In addition, one measure for the ADHD module that showed significant change, even though the change was in a positive direction, ideal practice for that measure was 0% while all other measures ideal practice was 100% compliance. Specifically, the measure looks at the percentage of patients who did not show up for their follow-up appointment. Ideally, all patients would show up for their follow-up visits, so a score of 0% would be ideal practice. This measure focuses more on patient behavior than physician performance. Though providers can influence “no show” rates (Dugdale, Epstein, & Pantilat, 1999), there are many aspects out of the providers’ control that could influence whether or not a patient will show up for a scheduled visit.

Therefore, while this is a good indication of quality care, the patient needs to show up for a visit to receive appropriate care, it may not be a fair indication of the performance of the provider or the effectiveness of the module. Also, the purpose of the ADHD module was to increase the number of follow-up visits for patients who were initiating treatment for ADHD. The first step would be to ensure that providers were scheduling these visits. It stands to reason that an increase in the number of visits scheduled may lead to an increase in the number of visits missed by patients. Not only is the pool of potential visits larger, but also more aggressive scheduling may lead to scheduling visits for patients who may have just declined to even schedule the visit previously.
All other measures showed improved performance. The most promising results came from the Smoking Cessation Module, which also had the largest sample size. There was an increase in scores for all measures and the standard deviation for each measure decreased. This shows that not only did participants' performance improve, but that the variance among the providers also decreased. As participants moved closer to ideal performance (100%), variance would naturally decrease as physicians get closer to 100%.

Without additional data, no conclusions can be made as to why high levels of performance change were seen in certain measures. The measures that saw the most improvement had Stage A compliance rates ranging from 4% to 67% and Stage C rates ranging from 33% to 94%. This shows that these were not measures that had typically low baseline rates of compliance, which might have indicated strong need or opportunity for improvement. The Stage C rates also did not show across the board high compliance rates, which might have indicated the ease with which these measures could be improved. All that these improvements in rates of compliance indicate is the possibility that these modules can influence performance. More studies are needed that would look at further verification of the reliability and validity of these data, the reasons for improvements when they are seen, and the maintenance of these improvements.

Performance data collected through the Part IV Modules only tell part of the story of the impact of the programs. Figure 12 shows how data from chart reviews cannot assess all of the impact of these modules. The red square represents the data collected as part of the modules. The grey represents an example of improvements in practice. The figure shows that the data from the module only show a small set of possible outcomes.
The grey shows that the improvements would overlap the areas measured, but really represent something greater. The qualitative portion of this study means to illuminate the grey portion of the figure to see the true impact of these modules.

Figure 12: Impact of Modules versus the data collected through chart audit

As described above, participation in the qualitative portion of the study was on a volunteer basis and therefore, it is unknown if the volunteers interviewed are representative of all participants that completed the modules. Though it would have been useful to compare a number of variables, like practice size, number of years in practice, etc., to determine if the subjects interviewed of the qualitative portion of the study were significantly different from all other participants of the module, only performance scores were available. As a result, these data were used to determine if there was a significant different between the interview subjects and other participants. Data from interview participants were separated. A paired t-test was used to compare Stage A scores and Stage C scores of the interview participants only. Unfortunately, due to small numbers,
the data were too unstable to garner meaning from the analysis. The standard deviations were quite high indicating that there is a fair amount of diversity in performance rates on each measure. Because of this variability, a larger sample size is needed for any meaningful analysis. So even though there were no measures that showed significant differences in performance rates when comparing Stage A and Stage C, unlike the significant differences seen in the larger data set of all participants, this may not indicate that there was no improvement in the intervention group. Though it would have been helpful to have data that could verify whether or not the interview group was somewhat representative of the participants of these modules, there were not enough participants or other forms of data available to make this assessment. Despite this limitation, which will be explained more in the “Limitations” section, the data from the interviews still provide foundational information about participants’ views of meeting the Part IV requirement through web-based modules.

Relevance

The most important concept that was related to whether or not a participant was satisfied with his/her experience of going through the module was relevance. Those who had low expectations when starting the MOC Part IV process were able to find value in the process when the module was relevant to their practice. For some, the chart audit revealed genuine gaps in areas that were germane to their practice. Others were able to tie their participation into other requirements, like Meaningful Use or PQRS.

Sometimes respondents were unsatisfied because they could not find a module specifically related to their practice. Adult learning theory, particularly the work of
Malcolm Knowles, supports this idea. For example, one of his adult learning principles states that adult learners are relevancy-oriented (Knowles, 1984). Through this study we can start to see what could constitute relevance for Part IV Modules.

For some participants, the issue of relevance was obvious, like the physician, who is Board-certified in family medicine, but mainly works in urgent care, would have to take a module that would have a focus on a primary care setting. This participant was not able to find a module that met his exact needs.

There were also less obvious issues with relevance. A physician could be a pediatrician who works every day with parents to promote breastfeeding, but a breastfeeding module still might not be relevant. For one participant, who had already been working on improving breastfeeding rates in her hospital, the module was not specific enough and therefore was not relevant. She had too much experience in this area and she did not have the same kind of basic gaps in practice that the module was aiming to fill. Another participant had major external barriers. Specifically, infant formula was available for free in his community and the mothers he saw had to go back to work relatively early. He said that without removing the financial incentive of not having to pay for formula, the parents with whom he works would not put in the hard work it takes to breastfeed and pump at work.

These were just a few example of how relevance is an issue for participants, beyond just topic relevance. As indicated, first participant did not have the gaps in practice necessary to make participating in the module relevant for her while the second participant’s practice setting was a major contributor to how relevant he found the
module. He had a need for improvement, but the module did not discuss the particular issues he was facing in his practice setting. Also, the standard of practice advocated in the module was too high for him to achieve considering his external barriers. So relevance moves beyond just topic area. It reflects the exact gaps in practice, the setting in which participants work, the type of work they are doing, external barriers, and other factors that might need differentiation in a module to make it relevant to participants’ practices.

Makers of these modules need to consider all of these variables to create experiences that would be relevant to all different situations, practices, and practitioners. This may even mean creating a different standard depending on external barriers or previous improvement work in the area. This type of tailoring may be necessary to provide truly relevant experiences for participants through these web-based modules.

**Learning**

Some participants did discuss the learning that happened as a result of going through each step of the program, but mainly the learning happened during the standard educational sections. This shows that formal education can be an important part of modules. While modules are not required to have educational components, participants who had gaps in knowledge that contributed to gaps in practice valued the education and were able to make that education contribute to changes in practice. Also, the examples in the results section show how learning had an energizing effect and motivated participants to work toward improvement. The learning approach was familiar for participants, the way traditional professional development had worked for them in the past.
While some participants did say they also learned about quality improvement by going through the process, most participants did not discuss learning about this process. Also, the number of participants who talked about improving practice through simply remembering to do something differently shows a need for basic education about quality improvement processes. While habits can be a strong force to explain behavior, changing habits is not an easy task. “A growing body of research shows that individuals who have developed habitual behaviours become less likely to act on new information and may even avoid information that challenges the present behavior” (Nilsen, Roback, Brostrom, & Ellstrom, 2012). Simply avowing to change behavior is not enough. “Successful habit change interventions involve disrupting the environmental factors that automatically cue habit performance” (Verplanken & Wood, 2006). This points to the need for some kind of intervention that goes beyond a physician’s intention to change.

Much clinical practice occurs in stable healthcare contexts and can be assumed to be habitual, thus making many clinical behaviours unlikely to be spontaneously reconsidered. For any intervention aimed at clinical behaviour change, we can only expect results if healthcare professionals have positive attitudes and a strong intention to modify the target behaviour. Positive attitudes and good intentions are not sufficient. Interventions may be successful in changing attitudes and intentions, but these changes are unlikely to be converted into the desired clinical behaviour if the specific behaviour that needs to be modified or removed is strongly habitual. (Nilsen, et al., 2012)

Simply remembering everything that should be done in a visit is difficult enough and then to have to habituate all of these aspects of care without systemized support to disrupt the environment is not realistic. A study by Yarnall and colleagues shows that it would take physicians 7.4 hours per day to complete all the preventative services recommended by the US Preventive Services Task Force (USPSTF) (Yarnall, Pollak,
Ostbye, Krause, & Michener, 2003). Since this does not include time for treating sick patients, there is obviously a tremendous need for more system-based approaches to practicing medicine that would disrupt practice patterns to support change. As demonstrated in the background above, while a commitment by a physician to provide a service is essential to quality improvement, good quality improvement techniques, like creating reminders or clinical decision support systems, need to be the cornerstone for lasting change. The participants that opted to try to create new habits rather than work to implement a support system for best practices will have difficulty sustaining improvement. The fact that participants in the modules did not discuss learning such techniques shows an opportunity for modules to include more education about improvement techniques to help dissuade participants from simply trying to remember to do better. An early study by Duffy and colleagues showed that practice improvement was novel for most participants. The module investigated did not suggest specific interventions to be implemented for improvement and this study concluded that this should be added since many physicians did not know what to do to improve practice (Duffy, et al., 2008).

**Performance**

There were many different types of changes that were described by participants. Some seemed to comply with high-quality improvement practices, while others, like the “new habits” model described above, were less likely to lead to lasting changes.

A few participants did discuss the difference between what was really happening in their practice and documentation that was available. This shows a limitation to these
modules in their ability to assess practice change. Some of the changes seen through the data review could be simply a change in documentation and not a real change in the care of patients. Also, since these are self-audits, there is nothing to prevent participants from inputting data into the system differently than what is documented. Whether they remember covering an issue with a patient in a different way than what was documented, or they just do not take the data entry seriously, the data can only represent actual patient care and must be viewed that way. In the interviews, some participants did allude to survey fatigue or having to settle on selecting an option that they felt did not fully represent the patient care that was delivered. These examples further show the limitations of the data collected through the modules and the possible need for triangulation to verify the impact of the modules, and more importantly, make the modules more useful to participants through more accurate performance assessment. An early study by Gerbert and Hargreaves that investigated the reliability and validity of four different kinds of physician performance assessment: physician interview, patient interview, chart audit, and videotaped observation, further supports this. Their “findings suggest that no one method provides an accurate picture of physician behavior and, therefore, that a combination of methods should be used” (Gerbert & Hargreaves, 1986).

The quality of the improvement projects implemented as a result of participating in the modules could have an influence on the ability of these changes to lead to lasting improvements in care. As explained above, those who just planned to remember to do something differently would be less likely to lead to lasting change, while those who made more systematized changes, like changes to electronic health records, checklists,
practice systems, would be more likely to lead to sustained changes. Again, the variety of performance changes shows a need for education about quality improvement techniques to help clinicians implement more evidence-based changes. A study by Zisblatt, et al., showed that when quality improvement techniques were combined with standard performance improvement continuing medical education, participants were able to sustain improvements for 5 years after the original educational intervention (Zisblatt, Kues, Davis, & Willis, 2013). This shows a need for including quality improvement education as part of these modules.

Another important point about the possible impact of these modules on performance has to do with the fact that these modules only collect a limited amount of data on performance measures for a relatively short period of time and do not collect data on patient health. Though collecting data on patient health would be extremely difficult and outside the scope of these modules, which exist as a way to demonstrate the physicians’ participation in improvement projects, the true purpose of this new requirement is to have impact on patient health. Though the measures are chosen because evidence exists that connect these practices with better patient health, practicing all of these measures do not guarantee improved patient health and the measures do not encompass all that can be done to improve patient health. The interviews uncovered other practices, like starting a breastfeeding class, or purchasing new scales to accommodate patients of size, that were not measured through the modules, but could contribute to better patient care even more than improvement in the measures could. This is another reason that more robust methods of performance assessment may be necessary.
This will not only help to show the true impact of these modules, but will also give participants more options for improvement that might make modules more relevant to different types of practices. Though this must be balanced with the amount of time and effort required by participants, it would be possible to audit fewer charts and add other methods of assessment instead.

Another issue to be considered about Part IV Modules is the focus on the individual to influence changes in practice. Some participants did speak of their participation in these modules as a private or personal matter because it is tied to their board certification. This is a good reason for participants to focus only on improving their own practice in some way, which might contribute to a focus on changing habits or remembering to do something different and not on interventions to support quality improvement efforts. This personal connection that physicians have with their Board certification, something that is done outside of their jobs, something that is done for their own credentials, might be a barrier to implementing more system-based changes, but definitely shows a need for web-based modules like these so participants do not have to be dependent on employers to help them maintain their certification. A demonstration project by the American Board of Family Medicine tried to combat this exact issue of the system vs. the individual in Part IV experiences.

The American Board of Medical Specialties' Performance in Practice ("Part IV") portion of Maintenance of Certification (MOC) requirement provides an opportunity for practicing physicians to demonstrate quality improvement (QI) competence. However, specialty boards' certification of one physician at a time does not tap into the potential of collective effort. (Fisher, Brenner, Cheren, & Stange, 2013)
This demonstration project included support to clinicians as they participated in Part IV Modules and determined that the support was effective in facilitating group participation.

To make participation meaningful, physicians and program developers may have to think differently about board certification and focus on the opportunity to improve practice in groups to truly leverage the benefits of the quality improvement process.

**How Do Part IV Modules Impact Performance?**

The most important finding of this study is the information about how participating in web-based Part IV Modules can impact physician performance. Figure 13 shows a model of how and when these modules can impact practice.
Figure 13: The areas in which Web-based Part IV Modules can impact physician performance

The modules seem to be most effective when the participants have control over all aspects that influence the improvement. This could be when only internal barriers exist, like when there is a gap in knowledge, or when the barriers to change can be overcome through an organizational change that the participant has the power to affect. However, if the barrier is external to the participant’s practice, either an organizational improvement that the physician does not have the power to change or something totally outside his/her control, like patient factors or reimbursement, the modules will not be effective in helping participants improve their practice.
If the source of a gap in practice is internal, for example, a participant just does not know something or does not agree with a guideline then these modules can have a major impact on practice if they have educational components that are successful in increasing participants' knowledge or changing attitudes. This is a very achievable goal for these modules. If there are no other barriers, like a barrier in the office systems or a patient factor that would get in the way of the improvement, the participant can implement a change rather easily and with little use of system-based quality improvement techniques. An example from the interviews can be seen in the participant that did not know about the importance of having patients set their own quit dates for smoking cessation. Assuming that the physician learned the theory behind this new practice, agreed with it, learned how to speak to patients about setting a quit date, he could easily implement this change on his own. If he sees a lot of patients who smoke and has the opportunity to practice this new technique, the likelihood that he would revert back to urging patients to quit smoking right away without setting a quit date is unlikely. The need for a system to support this change is minimal, but the change in this physicians approach could be powerful.

Other types of barriers to improvement may be internal, but may require more support to implement. While such a participant above might now understand the importance of setting a quit date, he or she may have a hard time remembering to do so when the opportunity arises. This would be an opportunity to use some sort of reminder system or clinical decision support system to help remember. This would require some understanding of quality improvement strategies, but not particularly advanced strategies.
A low-tech option, like a sticky note or checklist, might be the perfect system for some providers to help them remember. More advanced techniques, like a change to the electronic record system, might also be effective. While this might help to make the change more permanent or could help extend the change beyond the one individual participant, it is not necessary to make a change like this.

If external barriers exist or if they need support, participants might need more access to quality improvement strategies and the power to implement such strategies in their practice systems to make changes. For example, the participant who does not have the time to assess the smoking status of every patient could set up a system where support staff is responsible for the assessment. Some quality improvement techniques, like reminder systems for the support staff or regular audit and feedback, would help the implementation and maintenance of such a system. Participants who do not have the power to make such a change or who do not know appropriate quality improvement techniques would not be able to change practice effectively. In cases like these, web-based modules might be less effective in helping participants make changes in practice. This is why contributing factors, like power to make changes or experience with quality improvement, may need to be assessed to know what kind of changes should be expected.

Lastly, some participants might face external barriers that are completely out of their control and where quality improvement techniques no matter how advanced will not help. One example is the participant who described the financial incentives for using infant formula and its connection with dissuading mothers from breastfeeding. Though he tried to improve his performance by counseling patients more and creating a support
group for parents, he felt it was clear that as long as formula was available for free, it was
going to be a major barrier to breastfeeding in his community. Even a web-based module
and a participant who was very knowledgeable about quality improvement techniques
and has power to make major system-based changes in his practice would not, alone, be
able to change such a barrier.

These examples show situations when these modules are able to encourage
change and when they are not. Module creators may want to consider questionnaires that
would help assess barriers before participants start a module to help them determine the
potential usefulness of participating.

Motivation
Ryan and Deci, founders of Self-Determination Theory, in their seminal paper about
motivation, state that “to be motivated means to be moved to do something” (Ryan &
Deci, 2000). In the results section, different aspects of the modules are described that
affect participants’ level of motivation (how much motivation). Figure 11 shows how
each step of the process can contribute to participants’ motivation and influence how
much they are moved to do something. But when one considers the participants’
motivation through the view of Self-Determination Theory, the idea of level of
motivation is not enough. A look at the orientation of the motivation (i.e. what kind of
motivation) must also be considered. Table 8 shows what is meant by the kind of
motivations described in Self-Determination Theory.
### Self Determination Theory in Relation to Participation in Part IV Web-based Modules

<table>
<thead>
<tr>
<th>Amotivation</th>
<th>External Regulation</th>
<th>Intrinsic Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td><strong>Reasons for participating</strong></td>
<td></td>
</tr>
<tr>
<td>Perceived non-contingency</td>
<td>None. Potential participant is not required to participate and feels no need to participate.</td>
<td></td>
</tr>
<tr>
<td>Low perceived confidence</td>
<td>Only participating because of requirement. Does not see any other value.</td>
<td></td>
</tr>
<tr>
<td>Non relevance</td>
<td>Participating because wants others to think he is a good doctor. Pride involved because of how others perceive his performance.</td>
<td></td>
</tr>
<tr>
<td>Non intentionality</td>
<td>Participating because thinks quality improvement is important and thinks the goals of the program are important. Thinks the activity can help.</td>
<td></td>
</tr>
<tr>
<td>Salience of extrinsic reward or punishment</td>
<td>Participating because thinks QI and goals are important and feel that participation should be a part of their regular practice because it aligns with their internal goals perfectly and the module is an integral tool to improving practice.</td>
<td></td>
</tr>
<tr>
<td>Compliance/ Reactance</td>
<td>Participates because likes QI modules. Enjoys the process regardless of any external results.</td>
<td></td>
</tr>
<tr>
<td>Ego involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on approval from self or others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conscious valuing of the activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-endorsement of goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hierarchical synthesis of goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congruence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest / Enjoyment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inherent satisfaction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Self Determination Theory in Relation to Participation in Part IV Modules
Amotivation

Amotivation is described as not being motivated to do anything. This means there is no reason to participate. Clearly, by simply completing the modules, these participants were all moved to do something. They all completed each step, which means none of them experienced amotivation as described in the table. Though some participants did describe some demotivating factors (lack of relevancy of the modules etc.), the overarching reason for participating, which was to meet the MOC requirement, prevailed and continued to motivate the participants to complete the project regardless of the demotivating factors. However, before the requirement was in place, the lack of participation in these types of programs and the steep dropout rates as described in the Introduction, do show the importance of the requirement and that there exists a general problem with motivating physicians to complete such activities without such a requirement

Intrinsic Motivation

Intrinsic motivation is clearly defined as “doing something because it is inherently interesting or enjoyable” (Ryan & Deci, 2000). Ryan and Deci clearly separate any motivation for doing something that includes an outside benefit as extrinsic motivation narrowing the definition for intrinsic motivation to purely describing interest and enjoyment. Similar to Amotivation, no participant could be described as being intrinsically motivated to complete the modules. That is because the work required to complete the modules would not be described as enjoyable and the reason for participating in the module would not be for the pleasure of doing the module in and of itself. Though some participants described aspects of the process as enjoyable (interest in
looking at background of patients or in the education provided), the reason for moving through the process was influenced by outside forces as well, like meeting the requirement or improving performance and patient health. Since these other goals are part of the motivation, intrinsic motivation does not fit. While participants' perceptions of the alignment of the tasks of the module and the achievement of the goals to improve performance and patient outcomes can influence the kind of motivation the participants were experiencing, these would still not create a completely intrinsic kind of motivation.

**Extrinsic Motivation**

The kinds of Extrinsic Motivations described in Table 7 are helpful in interpreting the types of motivation participants were experiencing. As described by Ryan & Deci, traditionally extrinsic motivation was viewed as an impoverished kind of motivation, but Self-Determination Theory shows that extrinsic motivation cannot only be powerful, but also valuable and engaging. “Students can perform extrinsically motivated actions with resentment, resistance, and disinterest or, alternatively, with an attitude of willingness that reflects an inner acceptance of the value or utility of a task” (Ryan & Deci, 2000). This range in the kinds of extrinsic motivations available can help creators to evaluate how to bring meaning to the MOC requirement by promoting more Identification and Integration (which would indicate acceptance and agreement) with the requirement, as opposed to simply requiring participation. While External Regulation, i.e. the act of requiring participation to maintain board certification, is powerful, the best outcomes may not come from a reliance of this type of motivation. Promoting more “active and
volitional (versus passive and controlling), forms of extrinsic motivation” is essential to provide meaning and value to any educational activity (Ryan & Deci, 2000).

**Extrinsic Motivation: External Regulation**

External Regulation is described as the least autonomous of the types of extrinsic motivations. External Regulation refers to performing an action to “satisfy an external demand or obtain an externally imposed reward contingency” (Ryan & Deci, 2000). Those who sited meeting the MOC requirement as the main and only reason for participating in a module were acting out of an externally regulated source of motivation. Particularly, the participants who saw no value in the process and who only moved through each step to ensure that they could receive the rewards of maintaining their certification (and avoid the punishments of not maintaining it, i.e. lose their job or receive a demotion), were only motivated through External Regulation. This type of motivation was seen more often at the start of the process. Since they knew very little about the process, but knew that it was required, the only source of motivation was from this external regulation.

This type of motivation can be very powerful. “I had to do it because I needed some points. So I was going to do it come hell or high water” (1125, L155). But it can cause participants to only complete each task required with no or little thought to the potential impact the module can have on their performance or patient health. It can force physicians to complete the modules, but it cannot dictate the spirit with which they participate. As described in the Standards for the American Board of Medical Specialties Program for MOC, Part IV is meant to “contribute to improved patient care through
ongoing assessment and improvement in the quality of care provided” (American Board of Medical Specialties, 2009). Though improvement in practice is cited as the intention of the requirement, there is no guarantee that participants who go through the process will achieve this goal. There is no requirement to show actual improvement in practice to gain credit. And even for those who do show improvement through the data collected in the modules, there is no guarantee that these data reflect real improvement that will last beyond the improvement cycle imposed by the module. The spirit with which physicians participate can influence these outcomes.

Though a requirement to complete the module will result in participants completing the modules, the quality of participation and the achievement of greater goals of teaching about quality improvement and improving patient care cannot be realized if participants’ goals are simply focused on completion.

**Extrinsic Motivation: Introjection**

Introjection moves closer to a more autonomous source of motivation, but it is still controlling because the action is performed “with the feeling of pressure in order to avoid guilt or anxiety or to attain ego-enhancements or pride” (Ryan & Deci, 2000). Some participants described how the modules spurred them to make improvements in practice through data comparison with other participants or with colleagues. These participants were describing Introjection as their type of motivation. The egos of the participants were involved. One said she was embarrassed while another described his pride. This type of motivation can be very powerful to move participants toward changing their practice. While with External Regulation, participants only goal was completion, with
Introjection, a secondary goal of improving how the participant is viewed in comparison to others is also a factor. Even though improvement in practice is not necessary to meet the requirement for MOC, this does not matter to those who find motivation from introjection. By participating with colleagues and sharing data with one another or through the data feedback reports after the first chart review that showed participants’ data in comparison to peers and national benchmarks, these modules were able to tap into this type of motivation.

As long as measures are aligned with best practices and participants’ egos are involved in doing better in complying with these measures when compared with others, Introjection can help achieve the higher goal of improving practice rather than just completing the steps. However, if a participant’s goal is only to show others that they are doing better in this program, the limitations of what is measured can reduce the power of this type of motivation in its ability to improve care. For example, one measure for the smoking cessation program is to ask patients about their use of tobacco. As one participant described, it is possible to ask patients about tobacco use in a very perfunctory and superficial way. This could be documented and when data are reviewed, a participant’s compliance with the measure could improve to 100%. While a cursory question can improve the compliance with a measure and achieve the desired outcome of a participant who is only motivated through Introjection, it may not actually lead to better patient care. The goal of the motivation may be to improve how the participant looks to others without regard to the patient or the quality of care that patients receive.
Extrinsic Motivation: Identification and Integration

Identification and Integration both refer to very autonomous types of motivation. With Identification, the participant identifies with the “personal importance of a behavior and has thus accepted its regulation as his or her own” (Ryan & Deci, 2000). “Integration occurs when identified regulations have been fully assimilated to the self. This occurs through self-examination and bringing new regulations into congruence with one’s other values and needs” (Ryan & Deci, 2000). Participants did describe some conscious valuing of the activity. Since all participants reported that this was either the first time participating in this type of web-based activity or one of the first times, they could not assess the value of the activity before participating. After going through it however, some participants did describe the activity as valuable and even said they would participate in similar web-based modules. These participants saw the activity as helpful in some way. Some recognized the value of assessing their practice and finding gaps that they did not realize existed. Others found the education and resources helpful and were able to implement changes in practice to incorporate what they learned or the tools that were available.

In those examples, the participants were talking about something more than what they needed to do to meet the requirement or what others were expecting of them. The motivation becomes more internalized and the locus of causality is seen as more internal, thus moving it closer to intrinsic motivation. Examples included participants talking about helping their patients, or improving their practice. Participants discussed feelings of letting patients down if they did not provide evidence-based care or a desire to help
patients through their intervention based on the module. As the participants' feelings and emotions about their patients and the care they received were engaged, the more they internalized the goals of the module. They went beyond completion by maybe engaging other members of their practice or implementing an improvement with the goal of improving the care delivered to patients.

While evidence of some Identification was apparent, there was very little evidence of Integration. Since the modules are so new, participants did not have any experience with these web-based modules to have total alignment with the steps and goals of the modules and their own values. Some participants did not have any experience with quality improvement or did not value quality improvement, which would make it hard for those participants to even identify with the process of improving quality, never mind the use of these particular modules to help make these improvements. And even those who believe in quality improvement and have positive experiences with quality improvement cycles would not have the specific experience of participating in these modules to know if they would truly help them improve the quality of the care they deliver. This would make it impossible for participants to even know enough about the process to fully identify with it and internalize it enough to lead to Identification.

By recognizing not only participants' level of motivation, but also the kind of motivation participants are experiencing, creators of these programs can work to enhance participants' acceptance and belief in the goals of these modules and the ability of the modules to achieve these goals. Policy makers and module creators need to be mindful of these kinds of motivations and help to facilitate more internal feelings of alignment.
and self-endorsement with the goals of these modules and not rely on external regulation as the only motivation.

There is a tension between what is required of physicians to demonstrate participation and meaningful participation in quality improvement. For example, the tension between the difficulty and tedium of the chart audit process versus the benefits from the results of that process indicate that creators should consider ways to decrease the burden yet still maintain the benefits. This could indicate less of a focus on statistical significance or other concerns about data strength or outcomes assessment and more focus on the educational value of the data review experience. This may not mean completely removing less motivating parts, like the chart audit, since there were elements of the chart audit that encourage emotional engagement, but is an indication that more thought should be given to balancing burden and benefit with a true focus on the participant and the goal of improvement rather than the significance of the data. Though these modules seem to be motivating some to make improvements in practice, decreasing the less motivating factors may lead to a better experience for participants.

**Implications for Creators of Part IV Modules**

As long as physicians continue to participate in MOC and Part IV is a requirement of MOC, there will be a need for modules like these so physicians can participate as individuals, regardless of their practice setting or other resources available. Creators of these modules could do more to make participation valuable. This list highlights some changes that could be made to modules to make the experiences more meaningful for participants:
1. **Assure Relevance**: Part IV options must be relevant to physicians' practice and relevance does not just mean that the topic of the module is germane to their practice. It also includes consideration of elements like practice setting, baseline performance, experience with quality improvement, and ability to implement changes in systems to support improvement. Assurance of relevance can be achieved in a few ways:

   a. Short assessments before registration can help participants decide if the program is relevant for their practice. Questions like the number of patients they see with the disease state, how recent improvement efforts were made in this area, the participants' perceived need for improvement, or the ability of participants to make system or practice-wide changes, can help physicians determine the appropriateness of participating in certain modules.

   b. System-based assessment that would influence the chart review process. If a participant knows that a certain practice is not happening, the participant could be allowed to indicate that this is a system issue and bypass this question in the chart audit. This would prevent participants from having to continually enter the same data over and over again. This would reduce the burden of the chart audit process and allow for more meaning in the audit process.

   c. Need for more diversified experiences: While the irrelevance of certain topics was definitely an issue that highlights the need for more variety in
modules to include topics that are relevant to all types of practices, topic
was not the only element that determined relevance. Practice setting,
baseline compliance rates, experience with quality improvement, and
volunteered power to make improvements in practice, were other elements
that determined relevance. If creators could offer multiple modules in a
single topic area that could provide a diversity of experiences, maybe one
for someone who works in a rural setting, another for someone who is
experienced in quality improvement, and another for someone who has a
low perceived rate of compliance, these diversified experiences could help
make participation more valuable.

2. **Teaching QI strategies:** One of the goals of the Part IV requirement is to teach QI
strategies and while going through Part IV Modules does teach the general
process of improvement, which can be very valuable for beginners, there were
still many participants who talked about trying to remember or creating knew
habits without the aid of strategies that have been proven to improve practice.
These modules can be improved by including education and specific guidance on
these strategies to help encourage more lasting improvement.

3. **Other data to show gaps in practice and improvement:** While the data collected
on the measures are meant to represent actual practice, they are not actual
practice. There is little triangulation to demonstrate other dimensions of
deficiencies or improvement. There is a possibility that other pieces of data could
be collected to allow for a richer and less impoverished view of the quality of care
delivered. Though this needs to be balanced with the time and effort to participate, there is an opportunity to focus more on the educational experience of identify gaps and improvements rather than the rigor of that process.

4. **System vs. Individual:** While MOC is an individual effort that is meant to evaluate a single clinician’s skills to determine his/her proficiency to practice in a particular specialty of medicine, quality improvement is more about the system of practice. Efforts to encourage participants to include other members of the healthcare team and their colleagues in improvements can strengthen improvements and may lead to more lasting change.

5. **Benefit vs. Burden:** The real goal of Part IV is to help physicians improve their practice. This goal should be the main focus of creators of these modules. While data are important for any quality improvement project, there must be a balance between how much data are needed to “prove” improvement versus what is needed to inspire improvement. While the studies described above discuss the issue of sample size to accurately assess physician practice, should those same studies be used to set standards for educational activities meant to inspire physicians to improve? Further study is needed to help determine what is necessary to motivate a physician to improve practice and that might not be the same as what data are needed to truly represent practice.
Limitations

Quantitative

There are many limitations to the quantitative portion of this study. A list of limitations includes:

1. The study only includes three modules. These modules were not chosen because they represent a variety of experience available. There is no way to know if these modules represent all modules available.

2. Though studies have shown that self-audit can be as valid as data collected by professional chart abstractors (E. S. Holmboe, et al., 2006), (Simpkins, et al., 2007), this does not mean that these data will always be valid. Physicians who participated in these activities to meet Part IV requirements may have felt the need to show improvement even though this is not part of the requirement. This could have resulted in participants feeling pressure to “cherry pick” patients, or record follow-up data that might not be reflective of their practice. Also, in the interviews, participants admitted to survey fatigue, which may lead to participants entering data without truly looking through the documentation. Without any triangulation, there is no way to know if these data represent anything other than data physicians entered into the system. It is unknown if these data are a reflection of actual practice.

3. Reliability is an issue. Since these are self-audits, participants are going to be more attuned to the data collection process during the follow-up chart audit. For the first few charts, particularly for the baseline review, participants may not
know where to find certain documentation in their own charts, and might find a repository for data that was previously unknown to them. Participants are asked to complete the chart audits as a part of the educational and improvement process, though the hope would be participants would try to be thorough and consistent in their chart reviews, without utilizing the methods one would use in a research study (triangulation, validity and reliability testing), the data need to be treated with caution. The purpose of collecting these data is to allow participants to self-assess and aid the improvement process. The purpose is not to measure the effectiveness of these activities to improve practice. Though the data can be used in this way, the lack of purposeful design for outcomes measurement is an issue.

4. There is a lack of analysis of confounding variables that could indicate if there is more or less improvement based on these variables. Since only performance data was available, there was no way to conduct a more extensive analysis.

**Qualitative**

The purpose of this study was to evaluate what participants thought of the web-based modules used to meet the Part IV requirement of MOC. There are significant limitations with this study in fully investigating this issue.

1. Participants volunteered to participate and were not randomly selected. Without a randomized recruitment process, it is not known whether the subjects interviewed are truly representative of all physicians who participate in these modules.

2. The three modules selected were all created by CME providers. As a result, there might be a bias in the type of module created by these organizations. Participants
did remark on the usefulness of the education provided. It is possible that if a module was created by an organization that specializes in quality improvement or data management as opposed to education, there might not have been the same kind of education available.

3. The interviews were conducted, coded and analyzed by one person. The study could have been improved by having more than one person code the data to ensure consistency in the codes used and how the data was coded.

4. There was no triangulation. Other data could have been collected from other sources that could confirm or refute the perspective of the participant. Since this was a study about their perspective, the validity of their perspective is not essential, but further information would allow for a clearer understanding of how they actual feel and contributing factors. These areas all point to the need for more research in this area.

**Future Research**

More research is needed to evaluate the effectiveness of Part IV Modules to improve the performance of physicians. Studies that use objective measures of performance and that are able to tie participation more closely to improvements are needed. In addition, further research to determine if the physician views about Part IV Modules seen in this study are the same for other participants of other modules. A survey based on these findings to a wider audience might be an appropriate next step. With this policy still in its infancy, constant evaluation of these modules is necessary to ensure improvement to work toward meaningful participation.
Conclusions

The main purpose of this study was to determine how web-based Part IV modules impact participants' practices. The data from the quantitative part of the study and the impacts reported by the participants in the qualitative part of this study indicate a mixed, but generally positive impact on physicians. While participants did discuss issues with the requirement and their experiences with the modules, this study highlights areas where the creators of these modules can make the experience better for participants. Clearly there is need for more study, but as the entire country works to improve the state of health care in the US, MOC can play a role in introducing quality improvement to some and ensuring participation in quality improvement by all.

The findings of this study suggest that while MOC Part IV is not fully matured, some physicians are gaining the benefits anticipated by the creators of the policy and the modules themselves. The evidence suggests some participants are learning about quality improvement, uncovering gaps in practice and improving their performance. These are important competencies for physicians and therefore demonstrate some value in participating in these modules. There is a move toward employers leading the way for physicians to participate in these modules in a way that would be more relevant to physicians practice setting and individual performance gaps. However, the issues raised by participants who were leery of relying on their employers to create appropriate systems that will allow them to maintain their board certification seemed to be crossing some barriers. Physicians need a mechanism of meeting the Part IV requirement in isolation, since MOC is an individual activity. Even though currently there is not enough
variety of modules available to allow for meaningful experiences for all physicians, the
continued creation and innovation of new types of modules is necessary to ensure that
physicians can participate regardless of their employment situation.

While the system is not perfect, the dramatic gaps in practice and the documented
absence of many physicians in quality improvement efforts, point to the need to engage
physicians in this process. Physicians should understand basic concepts of quality
improvement and should be using these techniques to continuously improve practice.
The Part IV requirement of MOC highlights the importance of quality improvement as an
integral part of physicians' basic competencies. While there are issues with the current
modules available, the evidence included in this study indicate the possibility that Part IV
can at the very least engage physicians in the quality improvement process and also help
improve practice and as a result patient care.
Appendices

Appendix A

RECRUITMENT EMAIL TO PLANNERS

Dear XX,

I hope you are doing well. I am emailing you because I am starting work on my dissertation. For my dissertation, I am studying web-based modules that have been approved by one of the primary care boards as alternative modules to meet the Part IV requirements. I want to interview planners to better understand how these modules are created and the physician experience in participating in these modules. Please let me know who would be the best people to interview to get a clear understanding of how your module was created and how physicians have responded to participating. I would hope to conduct up to three interviews with each planner, each interview lasting about an hour to get a full understanding of the process you underwent to create the module.

Also, please let me know if I should contact someone in your organization to gain approval to conduct these interviews or if the planners can participate at their own discretion.

In addition, I would like to use data collected through your web-based modules to study the effectiveness of modules to improve physician performance and to contact participants to recruit them into the study. I would like to conduct one hour-long interview with participants of the web-based module to explore their experience in
participating in the module. Attached is the recruitment email and consent form that I would like to send to participants to recruit them into the study. Please let me know if you would be willing to send this email to participants on my behalf. Or if you are unable to do that, please let me know if I can have emails of participants to contact them directly.

Please feel free to contact me if you have any questions about participating. Attached is the consent form that outlines the scope of participation.

Please let me know if you are interested in participating.

Sincerely,

Lara Zisblatt, MA, PMME
Assistant Director
Boston University School of Medicine
Continuing Medical Education
72 East Concord Street, A402
Boston, MA 02118
(T) 617.638.4608
(F) 617.638.4905
laraz@bu.edu
www.bu.edu/cme
Appendix B

Recruitment Email with incentive

Dear Participant,

I am a doctoral student at Boston University and I am also the Assistant Director of Continuing Medical Education at Boston University School of Medicine. I am working on my dissertation, which is about the experiences of clinicians, like yourself, who have participated in Web-based Modules that meet the requirements for Part IV of the Maintenance of Certification process. The <<Organization>> has indicated that you have participated in the <<Module>>. I am writing to you because I would like to interview you for this study. Those who participate in the study will be entered into a drawing to win a free Kindle Fire!

The interview would take 30-60 minutes. Through these interviews we hope to discover your motivation for participating and completing the activity, any unintended effects of the Modules, and your experience of participating in the Module. We are also hoping to share these data with other developers of these web-based modules to help them improve their activities as well. Your anonymity would be preserved.

If you are willing to be interviewed, please provide your name, email address, and phone number and let me know what day and time you are available. (If you would prefer to call me, that would be fine.) Also, please click here to read the consent form. If you are willing to participate, I will review the consent form with you at the start of our call, answer any questions and you will be able to consent to participate over the phone. If you
would like to discuss the project before you agree to participate, please feel free to call me at 617.638.4608.

I would appreciate your participation. I know how busy you must be and know what a sacrifice it is to take the time to talk to me. Hopefully the results of this study will help us and other providers develop better activities that are more meaningful and useful for you in the future.

Sincerely,

Lara Zisblatt, MA, PMME
Assistant Director
Boston University School of Medicine
Continuing Medical Education
72 East Concord Street, A305
Boston, MA 02118
T 617.638.4608
F 617.638.905
laraz@bu.edu
Bibliography


Vita

Lara Jo Zisblatt (born 1978) received a Bachelor’s Degree from Boston University in Communication in 2000 and a Master’s in English in 2007. In 2010 she was awarded a certificate in Program Planning, Management, Monitoring & Evaluation from Boston University. She was admitted to the doctoral program at Boston University School of Education in 2009 and has focused her education on improving performance of clinicians.

She is Assistant Director of Continuing Medical Education (CME) at Boston University School of Medicine (BUSM). She started working at BUSM CME in 2003. She heads BUSM CME’s performance improvement and quality initiatives, and also works on program development for other more traditional educational activities meant to improve the performance of clinicians and as a result, patient outcomes. She has developed and managed performance improvement educational activities that reach national audiences and has also worked with local institutions to help them improve performance of their clinicians in a specific clinical area.

PRESENTATIONS:


• PI-CME: Implementing Performance Improvement CME in Medical Schools. The Association of American Medical Colleges and American Medical Association Webinar, National, February 27, 2009.


• Maximizing Physician Change in Obesity Diagnosis and Management: Lessons Learned from a PI-CME Activity. Alliance of Continuing Medical Education 2011 Annual Meeting, Orlando, FL. January 2012.


• The Impact on Motivation of Web-Based Modules to Fulfill Part IV of Maintenance of Certification: An Effort to Improve the Performance of Individual Physicians. Society of Academic for Continuing Medical Education 2014 Spring Meeting, Cincinnati, OH. May 2014.

• The Changing Landscape of Funding in CME. Society of Academic for Continuing Medical Education 2014 Spring Meeting, Cincinnati, OH. May 2014

POSTERS:

• EFFECT OF A PERFORMANCE IMPROVEMENT CONTINUING MEDICAL EDUCATION PROGRAM ON OSTEOPOROSIS SCREENING AT A COMMUNITY HEALTHCARE CENTER. Research In Medical Education, Boston, MA, October 2009.

• SLEEP/WAKE DISORDERS PRACTICE CIRCLES INITIATIVE. Alliance for Continuing Medical Education, San Francisco, CA, January 2011.
ARTICLES:


AWARDS:


- 2013 RISING STAR AWARD. Alliance for Continuing Education in the Health Professions, San Francisco, CA, January 2013.

Correspondence:

Lara Zisblatt
1205 Hutchins Ave
Ann Arbor, MI 48103
Lara.zisblatt@gmail.com