Conclusions and Questions

Practice-Based Learning and Improvement

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Abstract

Workplace learning is becoming increasingly important in all fields. While workplace learning in medicine, also called practice-based learning and improvement (PBLI) is not new, understanding how it works and how it fits with an individual physician's continuing professional development is new. In this article, we describe seven issues associated with PBLI and then pose questions for reflection, as continuing medical education (CME) planners consider working with PBLI.

Key Words: Context of care, continuing medical education, continuing professional development, information seeking, leadership, office systems, practice based learning and improvement, practice improvement

Practice-based learning and improvement (PBLI) describes a collection of activities that physicians and other members of the health care team engage in to link opportunities for improvement with resources that can address those opportunities. PBLI can be defined as reflection on and appraisal of one's own delivery of clinical care that results in pursuing an opportunity for improvement. The opportunity for improvement is addressed by a search for information that involves identifying reliable information sources, accessing information, evaluating its applicability and scientific merit, and integrating that knowledge and modifying current behavior. Ultimately, the health status of patients or patient care process, such as the use of guidelines, improves.

Opportunities for improvement can be identified in several ways, including evaluating the health status of patients and assessing the content and delivery of health care services provided in the practice. Resources for improvement can be delivered at the point of care or at another time in a variety of ways, but it is important that the evidence or knowledge provided be clinically relevant and reflect the circumstances of the practice.

Learning is central to the success of this mix of activities in creating and sustaining improvement. Improvement occurs when the health status of patients has moved closer to a treatment goal or the delivery of care has moved closer to the consensus best practice. One of the factors leading to improved health status is change in physician behavior. One of the factors that leads to changed physician behavior is learning.¹

Why PBLI Now?

PBLI is not new,²⁻⁹ but perhaps its time has come. There are increasing external pressures to change physician behavior, including reactions to the Institute of Medicine's report on medical errors,¹⁰,¹¹ concerns about variation in clinical practice,¹²,¹³ and

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a continuing concern about the effectiveness of "traditional" continuing medical education (CME).\textsuperscript{14,15}

PBLI has become a pressing issue because of the recent publication of new competency requirements by the Accreditation Council for Graduate Medical Education (ACGME) for residents and the American Board of Medical Specialties (ABMS) for practicing physicians through their specialty boards. To demonstrate competence in PBLI, residents and practicing physicians must be able to analyze their practice experience; locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems; obtain and use information about their population of patients; and use information technology to manage information.

In addition, we know more than ever before about how (and where) physicians learn and change, and we now have the capability (process improvement and information systems) to support physician learning in the practice setting. The emergence of practice-based information systems will facilitate providing that support. The emergence of information and communications systems, including the Internet, the electronic medical record\textsuperscript{16,17}, computerized physician order entry\textsuperscript{18,19}, and computerized decision-support systems\textsuperscript{20,21} makes PBLI more possible today. Using information systems, PBLI can be data based and can focus on management problems related to specific groups of patients in a practice. Furthermore, members of the practice health care team can use information systems to accurately monitor and measure patient health status and physician performance over time. These data can suggest areas for learning and improvement initiatives. With access to information focused on the characteristics of their patients and their own practice behavior, physicians can quickly access, assimilate, and incorporate what they have learned into their practice.

The medical profession expects that physicians will engage in PBLI. Tools are available to physicians interested in integrating learning and improvement into practice. The greater challenge is the deeper change required for physicians to provide the leadership required to establish a learning and improvement culture in the practice setting. Place matters. This cultural change will not occur by taking an incremental approach to change. It will require leadership by physicians engaged in forging new systems and a systematic approach to patient care that involves new partnerships with numerous people and organizations inside and outside the practice setting.

What follows is a discussion of seven issues that emerged from presentations at an invited conference on PBLI sponsored by the Office of Continuing Medical Education at The University of Florida College of Medicine. The articles in this supplement summarize, and in some instances add to, the issues raised in those presentations. Some issues discussed are directly related to one article appearing in the supplement, whereas others relate to several articles. We describe each issue briefly and then suggest several questions for reflection as you consider working with PBLI in your setting.

**Issue 1: Components of PBLI**

Most behavior is heavily influenced by the environment in which it occurs. What goes on in a medical practice is what the system in the medical practice has been set up to permit. For PBLI to occur, an environment must be designed to expect, allow, encourage, and reward learning in practice. Manning's article suggests five key components of PBLI in the practice setting\textsuperscript{22}:

- Easy access to data about practice performance
- Short, relevant educational experiences that must be convenient and accessible in the practice setting
- A system of patient-specific reminders
- Opportunities to discuss practice performance and what has been learned from that discussion with colleagues
- Seamless integration of PBLI with the work of the practice
**Questions for reflection:** Assume, at a minimum, that these components must be present in an office practice. But are all of the components necessary all of the time for PBLI to occur? How do the components come together? What support do the learners need for the learning to be effective? Can PBLI be accomplished only electronically? Can CME providers be a source of that support?

**Issue 2: Learning in PBLI**

Cervero reminds us that physician practice and learning are fundamentally social acts, and our attention is drawn to the place where learning occurs.23 Physicians make clinical judgments in practice and learn as they do this work. The description of physicians learning as they are working is not included in the traditional paradigm of CME.24 To a large extent, the way physicians learn and change in practice is described in the work of Geertma and colleagues, who suggest that a cascade of learning activities is initiated by “dissatisfaction with some aspect of practice behavior.”25 They suggest that feeling this dissatisfaction, or cognitive dissonance, a physician will commence seeking information to address the source of the dissatisfaction. Other researchers have also suggested that physician information-seeking patterns are driven by discomfort with practice behavior.8,26-28

In the work of Donald Schön,29,30 which was later expanded on by Eraut31 and Moon,32 we see the notion that physicians (and other professionals) learn in practice. Schön suggests that day to day and case by case, physicians operate in “zones of mastery” and are well prepared to manage most of what they see in practice. From time to time, however, they encounter a “surprise,” a condition or a result of treatment that does not fit with their expectations. The surprise stimulates “reflection-in-action,” and physicians immediately reframe and rework the surprise to determine if or how it fits with learned patterns. It is a form of “temporary” learning and experimentation. With time, they move to “reflection on action,” where they seek information and engage in more permanent learning that may lead to a permanent change in practice or at least in their professional knowledge.

**Questions for reflection:** When considering learning in the practice setting, how many physicians actually engage in this kind of learning? What makes a physician respond to a surprise in a “learning mode?” What can be used as evidence that learning has occurred? Is behavior change in the instance enough? How important is place to understanding and effecting meaningful PBLI? What can you do as a CME provider to support physician skill development in this area?

**Issue 3: Practice Alignment**

For effective PBLI to occur, there must be alignment among all components of a practice. Because a medical practice is a highly complex sociotechnical system, alignment is achieved only when there is consensus on clinical issues and procedures (the technical system), as well as agreement on goals, values, and expectations (the social system).

A sociotechnical system is a mixture of people and technology functioning in subsystems.33 The interaction of people subsystems and technology subsystems influences behavior within the larger system. In the people (social) subsystem, individuals interact as individuals or in groups and have roles and norms that govern these interactions. These interactions are also affected by components of the technology subsystem, such as computer hardware (equipment, workstations, and networks), software (operating systems and applications), data and data structures, physical surroundings and their design, procedures (both official and actual), and laws and regulations. A doctor’s office is a mixture of people and technology subsystems. It functions as a sociotechnical system, in which the two subsystems interact to influence behavior, including how a physician learns and implements what he or she learns.
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In their article, Mills and colleagues highlight the importance of the alignment of values, commitments, and expectations for PBLI to occur effectively. In other words, the social and technical behavior of the team in the practice setting must be congruent with the values and goals of the practice. Accomplishing this may require an emphasis on change management; an approach to change management that has been successful in a number of settings is to renegotiate the "physician compact." Essentially, renegotiating the "physician compact" recognizes that physicians’ roles and responsibilities are different than what most doctors expected. These expectations usually have more to do with the social than with the technical side of practice. The compact replaces expectations that cannot be met with agreements that align physicians’ expectations with the expectations of the practice.

CME planners should not expect to be able to accomplish practice alignment on their own. Rather, they should look for stakeholders within the health care system and practice with whom to collaborate.

Questions for reflection: Two simply stated but complex questions to consider related to the issue of practice alignment are “Can PBLI occur without practice alignment?” and “What must be aligned within the practice for effective PBLI to occur?”

Issue 4: Office Systems

Bierema suggests that PBLI will be successful in a medical practice only if and when that medical practice is viewed with a systems perspective. For example, each medical practice is a system comprising a collection of smaller office systems, or microsystems. Office systems are defined as an organized series of interrelated activities carried out by multiple staff to achieve a specific purpose. A rudimentary example of an office system in a physician’s office is billing where several individuals (receptionist, nurse, physician, billing clerk) have roles in a process that results in a patient (and insurance company) receiving a bill for services rendered. If a physician was responsible for all of those roles, billing would be less efficient. Physicians recognize, however, that other individuals in the office could play a role in billing in a way that would make the process more efficient. Health services researchers are coming to the same conclusion about other functions in a physician’s office, including the provision of health care services. Office systems and microsystems are another way to describe the technical subsystem discussed earlier. Some research has shown that the use of office systems contributes to the success of PBLI.

Questions for reflection: How can an office system contribute to successfully designing learning into work? What support can an office system provide to learning? What office system(s) must be in place in the practice setting to facilitate PBLI? How does an office system contribute to improved performance and health status? Can CME providers help individual practices develop, implement, and evaluate office systems as part of their mandate to support physician professional development?

Issue 5: Practice Data in PBLI

Staker shows that it is possible to collect data on almost every process and outcome in a practice. The data that are collected can be visually displayed; histograms and run charts can be used to display the data in easily understandable formats. Comparing practice data to a standard is a useful way to identify opportunities for improvement.

Staker suggests that physicians will value data if they are accurate and meaningful to their practice, provide information about patients over time, offer feedback on all of their patients, not just those covered by a particular health plan, include data on individual patients as well as data aggregated across patients, and are available where and when they are needed to support decision making.

When measurement and presentation of data are embedded in a practice, physicians and others involved in providing care can evaluate their work...
as they are doing it, engage in early problem identification, make real-time adjustments to meet emerging needs, and engage in actions that will prevent errors. This is one approach to practice improvement.

Questions for reflection: Imagine that a physician recognizes an opportunity for improvement in his or her practice data. Is that learning? What is learned at that point? Or does he/she initiate a search for information from an external source? Or does he/she reflect on past experience and then determine what to do? What should CME providers be doing to encourage and support measurement in practice? What should CME providers be doing to help physicians adopt an improvement culture in the practice setting? Should CME operations walk the walk and adopt measurement and other tools of improvement in their operations?

**Issue 6: Information Seeking**

Physicians seek information for questions that emerge during the clinical encounter. Traditionally, physicians used a variety of information-seeking strategies. In their article, Ebell and Shaughnessey suggest that clinical questions are the result of critical reflection by a clinician on his or her practice and are central to physician learning. They suggest that physicians will learn best when learning occurs in the context of patient care. It answers their questions, does not take too much time, and is directly applicable to their work. Articulating questions that arise in the context of care and answering them with the best available evidence, at the time the answer is needed, may well change the physician’s general approach to patient care.

Manning suggests two characteristics required for effective PBLI. The first is a method of supplying short, quick answers to questions arising while seeing a patient. The second is a reminder system to avoid errors of omission. Ebell and Shaughnessey described POEMS (patient-oriented evidence that matters) that are designed to provide physicians with practice-based decision support at the time of the clinical encounter.

Questions for reflection: Imagine a clinical encounter in which a question emerges. The physician uses information from an on-line information source or a source available on a handheld device to answer the question. Has the physician learned? What has the physician learned? When this happens, does single-loop or double-loop learning occur? Is reflection the key in the learning process? What should CME providers do to stimulate double-loop learning in their CME activities? What should CME providers do in current CME activities that model how physicians can ask good clinical questions, access valid information, use that information in solving clinical questions, and then embed that information into their cognitive map?

**Issue 7: Leadership**

Prather suggests that physician leadership is required to reshape medical practice for PBLI to occur and be successful. There are at least six components of physician leadership: integrated information exchange, aligned incentives, clinical process improvement, high-performance teams, partnering with the family, and partnering with the community. These components need to come together to create a PBLI environment that permits identification of errors and provision of solutions in a nonthreatening environment.

Better-informed patients, providers, and the public are demanding a new type of physician leadership. PBLI is one response to those demands. However, its emergence has been inhibited by physicians who are reluctant to embrace proven leadership principles. This reluctance is largely attributable to traditional medical training, which encourages leadership styles that magnify the resistance common to all change efforts.

Physician leadership is an absolute requirement for PBLI. It is needed to foster the change
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Lessons for Practice

- Practice-based learning and improvement recognizes that physicians learn outside formal CME settings and that continuing professional development is probably a better way to describe that learning.
- Physicians learn in their practice settings by reflecting on what they are doing or what they have done. The learning that occurs is the result of a complex social, political, cultural, and technical process.
- CME planners can facilitate and enhance the practice-based learning and improvement of physicians by collaborating with other stakeholders to create an environment for learning and make resources available for physicians to obtain the evidence-based information needed to provide the best possible care.

required to achieve continuous improvements in care. Incremental change in the manner and context in which care is provided is possible, but incremental change is often limited in scope and easily reversed. What is needed to ensure PBLI is change that requires new ways of thinking and acting in the practice setting.

Questions for reflection: What is the evidence that practice-based leadership style is related to better outcomes? How do leadership and PBLI interact for better outcomes? Does an office system model provide the environment for this type of physician leadership? What role does CME have in developing physician leadership skills required to reshape medical practice? Should CME providers find ways to integrate practical applications emanating from theories such as complex adaptive systems, learning organizations, systems theory, adult learning, and leadership? If so, how? If not, who should be tasked to do this?

Practice-Based Learning and Improvement: The Challenge

Cohen suggests that CME should be driven by a “bottom-up” assessment of a physician’s actual performance in practice: “Optimal CME should be highly self-directed, should incorporate individually tailored content, and should both ease the burdens of practice and improve the quality of what physicians do regularly on behalf of their own patients.” Few would argue with this sentiment. We know how to do this. However, from these articles, we learn that it is less the technical capabilities that are barriers to PBLI than the sociopolitical factors that will facilitate this integration.

If CME is to be a viable part of the inevitable emergence of PBLI, CME planners must develop new ways of thinking and behaving. Moving from the focus of being “top-down” providers of faculty or content-driven learning resources to a “bottom-up” approach driven by the specific measured needs for improvement in the practice setting is a major break from the dominant current practice in CME. The challenge facing CME practitioners is developing a strategy for PBLI that combines the technical, social, and political components essential for success.

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