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Introduction*

Effectiveness of Continuing Medical Education: American College of Chest Physicians Evidence-Based Educational Guidelines

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Abbreviations: CME = continuing medical education; EPC = evidence-based practice center; MOC = maintenance of certification

Why is continuing medical education (CME) important? Is the purpose of CME to demonstrate to participating physicians that their clinical practice meets standards of care? Is it to improve the quality of care? Should CME activities translate new knowledge into clinical practice? By definition, CME constitutes educational activities that serve to maintain, develop, or increase the knowledge, skills, performance, and the relationships a physician uses to provide services for patients, the public, or the profession.¹ If CME is to be effective, specific educational resources are necessary to provide the adult learner with the knowledge and skills needed to update clinical practices that most impact patient care. This document provides an extensive systematic review of the literature to determine what evidence exists about the effectiveness of CME in both knowledge translation and patient care outcomes. This represents an important first step in critically analyzing the CME delivery process and CME efficacy, both critically important issues for the

growing global emphasis on CME as a key factor driving maintenance of certification (MOC) and quality improvement.

RELEVANCE OF CME

The importance of CME is reflected in part because it is required by most state licensing boards, which specify an average of 12 to 50 CME hours annually to maintain medical licensure.² The MOC program of the American Board of Internal Medicine, as an example, intends to (1) improve the quality of patient care, (2) set the standards of clinical competency for internal medicine and its subspecialties, (3) foster continuing scholarship and improvement required for professional excellence over a lifetime of practice, and (4) help to lead quality improvement in medicine, while being respectful of physicians' time.³ A large component of the MOC process is accomplished through CME. With these regulatory obligations, an important question emerges. Is CME simply a system to help physicians fulfill a requirement, or does it effectively improve physician practice leading to better health care?

HOW CAN WE BEST LEARN FROM OUR PAST?

The reform of medical education and the study of how these reforms relate to physician instructors are not new. The Abraham Flexner report of 1910 and several subsequent reports^{4–8} called for a curriculum change in medical education, emphasizing the limited use of lectures, and promoting greater emphasis on problem solving and critical thinking. There was also a consistent focus on formative, as opposed to summative, education and evaluation. Summative assessments attempt to summarize performance at

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some point in time, typically at the end of a course or training rotation. They are not designed to provide immediate, contextualized feedback that is useful for helping the student during the learning process. Formative assessment, on the other hand, occurs when the learner is given feedback in a way that enables improved learning or performance. Formative assessment can have a significant impact on physician learning by affording the opportunity to evaluate and self-assess knowledge, skills, judgment, and professional values, helping to identify gaps in knowledge or skills and to encourage life-long learning. This process can also reinforce to physicians that they are providing established standards of care for their patients and are advancing positive changes in standards of care.⁹

Despite the Flexner report, physicians-in-training during the 1990s experienced little to no change in how they were educated or how they were encouraged to continue their education during their career as a physician. What did change dramatically, however, were the demands being placed on them as practicing physicians.^{10,11} In response, the American Medical Association commissioned a task force, called the “Initiative to Transform Medical Education” to address comprehensive reform of medical education, including CME. The Initiative to Transform Medical Education recommended focusing medical education and CME on the following primary goal: “. . . to promote excellence in patient care by implementing reform in the medical education and training system across the continuum, from premedical preparation and medical school admission through continuing physician professional development.”¹² Although substantial effort has addressed best practices in educational curriculum design for premedical and medical school training, very little work has been done to analyze the available knowledge regarding the much longer postgraduate physician learning period during which CME is currently the primary vehicle of organized training.

WHAT PRACTICAL INFORMATION CAN YOU TAKE AWAY FROM THESE EVIDENCE-BASED GUIDELINES?

For learning to be meaningful, knowledge application, not just acquisition, needs to be the primary target for change. Effective individual and organizational learning can be realized through a change process that results in acquired knowledge and its appropriate application. This is commonly referred to as “learning management” or the application of “knowledge management systems.” Learning management requires that medical societies on a global scale, and each physician learner on an individual level, determine which activities are the most effective in improving the acquisition

and application of knowledge, and which psychomotor skills ultimately lead to improved patient outcomes. Also of importance is to define the optimal duration and number of exposures to information in CME to ensure effectiveness. These processes are necessary to determine the most “cost-effective CME,” especially at a time when health care is being scrutinized by the public, government, regulators, and physicians themselves.

To date, there has not been an extensive review of the medical education literature using methodologies as rigorous as those employed by the American College of Chest Physicians to develop evidence-based practice guidelines. Thus, the American College of Chest Physicians proposed and obtained support from the Agency for Healthcare Research and Quality to identify and synthesize the evidence addressing effectiveness of CME. The Agency for Healthcare Research and Quality awarded the Johns Hopkins Evidence-Based Practice Center (EPC) funding to perform a systematic review of the literature to answer several key questions regarding the effectiveness of CME. That review and its associated report¹³ form the basis of this guideline, which is intended to inform medical teachers and learners.

These evidence-based guidelines are divided into several sections. First is a summary of the methods used by the EPC in performing and synthesizing the literature review, including potential limitations, and the process that the guideline panel undertook to translate this evidence into recommendations and suggestions. Bordage et al¹⁴ summarizes the limitations of the current educational research in CME, providing the rationale for a call to action for the entire medical community to design future CME offerings that are tailored to the educational needs and goals of the physician learner, utilizing a diversity of instructional models, strategies, methods, and media. The authors suggest the use of a “continuing health-care education study template” (or *CHEST*). This template addresses how future CME research can be approached, including the essential elements necessary for medical education studies and detailed outcome definitions. Adherence to specified research standards would allow for improved communication among researchers, and for translation of the results across study populations and settings. With reliable and valid results and the use of common terminology, CME will provide greater benefit to both the physician learner and the patient.

The subsequent section^{15–18} is devoted to a systematic review of the literature accompanied by evidence tables and graded recommendations. The first three of these articles^{15–17} summarize how CME affects the knowledge, skills, and attitudes of the learner. Mazmanian et al¹⁷ examine whether CME

events directly lead to changes in patient care. The final chapter in this section evaluates whether characteristics of the learner or the learning environment impact educational outcomes.

The final two chapters are distinct from the evidence review. McGaghie et al¹⁹ summarize important literature (some of which was included in the EPC report) about the role of simulation technology as an educational tool. Much of this work has been done outside the field of medical education. Research about medical training primarily involves learners in an undergraduate or graduate medical education program, which is not necessarily as applicable to posttraining practicing physician learners participating in CME events. The authors use the existing literature to make suggestions about how this technology might be used to increase the effectiveness of CME. The final chapter reviews the changing forces, largely regulatory, that are shaping the way CME might be designed and implemented in the future. Our hope is that this guideline will serve as a reference for medical educators, and a call to action for a more standardized and rigorous evaluation of CME and, wherever possible, its effects on patient outcomes.

CONFLICT OF INTEREST DISCLOSURES

Dr. Moores has no conflicts of interest to disclose.

Mr. Dellert is the Vice President of Educational Resources for the American College of Chest Physicians. He has served as faculty for Accreditation Council for Continuing Medical Education, holds a committee position with Alliance for Continuing Medical Education, and is immediate past president of the Illinois Alliance for Continuing Medical Education (or IACME).

Dr. Baumann has no conflicts of interest to disclose.

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