Lifelong Learning in Medicine and Nursing

FINAL CONFERENCE REPORT

AAMC
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Josiah Macy Jr. Foundation

American Association of Colleges of Nursing

Hosted by the Association of American Medical Colleges and the American Association of Colleges of Nursing

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A Vision for Continuing Education and Lifelong Learning

We envision a continuum of health professional education from admission into a health professional program to retirement that values, exemplifies, and assesses lifelong learning skills; emphasizes interprofessional and team-based education and practice; employs tested, outcomes-based continuing education methods; and links health professional education and delivery of care within the workplace.

To achieve this vision, we encourage an understanding of and support for the need for change, and collaboration among stakeholders responsible for the interdependent elements of this vision – academic institutions, healthcare systems, continuing education providers, accrediting bodies, licensing and credentialing boards, funders, and others.

Statement endorsed by the American Association of Colleges of Nursing Board of Directors, July 2009 and the Association of American Medical Colleges Council of Deans Advisory Board, 2009.

Executive Summary

The Josiah Macy Foundation's 2007 conference on continuing education (CE) in the health professions identified the need, and set the stage for, improvement in this last and longest phase of health professionals' education. Establishing a platform for change in an era of health care reform, the report stressed incorporating findings from the extensive literature of health professions' CE. These included: decreasing the focus on the didactic lecture as the primary format for CE; increasing awareness of practice-based learning; heightening attentiveness to the importance of CE as a tool to improve competency and performance in the academic health center; developing interprofessional education; and instilling lifelong learning skills.

The 2007 report, however, was silent on the ways by which these findings could be implemented. The need to move to this next step prompted the Macy Foundation to fund a jointly sponsored conference and consensus process hosted by the American Association of Colleges of Nursing (AACN) and the Association of American Medical Colleges (AAMC). This was a three-phase effort, detailed in Section 1; a pre-conference planning phase in which white papers were created in several critical areas and an invitation extended to key thought leaders and organizational representatives in Medicine and Nursing, subsequently known as the Expert Panel; an invitational conference involving these individuals; and a post-conference period devoted to expanding and consolidating the white papers and developing clear recommendations in five key areas. Although the conference focused primarily on nursing and medicine, feedback from a broader interprofessional stakeholder group was sought as the recommendations and report were finalized. Feedback from this interprofessional group was positive and indicated that the content and recommendations presented in this report were relevant to all health professional lifelong learning and continuing education.

The recommendations and dialogue articulated here represent the consensus of the Expert Panel, comprised of content experts and representatives of a wide array of stakeholders, including education, practice, and regulation. The report describes a preferred future for health professionals' continuing education or professional development and lifelong learning, which can best be attained through full implementation of the recommendations distilled here.

A Vision for Continuing Education and Lifelong Learning

While the Expert Panel and writing groups reviewed the literature, discussed the implications of their findings, and developed extensive recommendations, a vision was created for the future. This future for health professional lifelong learning places greater emphasis on interprofessional education and practice, preparation and assessment of graduates with skills that support lifelong learning; increased diversity in continuing education methods and self-learning opportunities; greater use of technologies to deliver evidence-based information and assess changes in practice; and a focus on ways in which this vision could be applied in the workplace setting. The recommendations that arose from this process provide a path for achieving this

vision which we believe is necessary to address many of the issues currently facing the country's healthcare system.

Major Recommendations

Over 30 major recommendations directed at a variety of organizational stakeholders evolved from the Expert Panel's work and subsequently were validated by a review panel. The process identified four key areas for analysis and recommendation.

Continuing Education Methods

Classroom education (meetings, conferences, rounds, courses, and in-service training) is a tradition among health professionals. Most of these programs employ didactic methods, demonstrated to be effective at transmitting new knowledge or delivering updates, but with little evidence that they produce change in the practice of health professionals. Newer and possibly more effective models are explored. Beyond classroom education there is a host of broadly defined but under-utilized educational interventions that exist which employ pro-active methods and strategies to effect learning and change in health professionals. Support from the Expert Panel for these methods was widespread.

Interprofessional Education

A large body of literature regarding interprofessional education and its possible merits – from undergraduate to continuing education - informed the panel and its writing groups. In addition, there exist compelling studies and reviews that suggest the positive impact of the development of interprofessional teams in primary care, geriatrics, and other specialized areas of health care. These two bodies of literature provide evidence for the need to educate new and practicing health professionals simultaneously and collaboratively.

Lifelong Learning

The panel defined lifelong learning by identifying key competencies including: an understanding of evidence-based healthcare and critical appraisal, familiarity with informatics and literature search and retrieval strategies, practice-based learning and improvement methods, self-reflection and assessment, and other skill sets related to knowledge management. While many undergraduate health professional programs have undertaken shifts towards problem-based learning, most entry-level education continues to rely on a primarily didactic, lecture-based approach, followed by rotations through standard clinical settings, with the emphasis still, for the most part, on knowledge acquisition and application.

Workplace Learning

Workplace learning was envisioned by the Expert Panel to encompass intra- and interprofessional continuing education and lifelong learning occurring in the clinical setting. Described as a *disruptive* construct, the model unites education and work as mutually dependent, forming a seamless process of employing clinical performance data to determine gaps in practice, establishing learning and other strategies to address

these needs, and evaluating the outcome. A subset of workplace education was considered to be *point of care* learning, defined by the panel to mean information retrieved at the time and place of the health professional/patient visit or immediately thereafter.

Evolving from the literature and the Panel's discussion, recommendations are directed to stakeholders in three key areas–education, practice and related entities, and regulation.

Education

First, recommendations are made to academic institutions, including those faculty members responsible for basic and undergraduate training, encouraging them to promote interprofessionalism, collaboration, and the development of lifelong learning skills. The recommendations also include the providers of CE— both educational leaders and faculty members—supporting the adoption of innovative and more learner-centered teaching methods. These shifts in the preparation of faculty redesign of curricula and development of relevant resources requires buy-in on the part of medical and nursing schools in addition to the recognition by accrediting bodies of the importance of these skills.

Practice

Second, a cluster of recommendations is made to healthcare institutions and systems, insurers, granting agencies, and others to support developments in the workplace as well as interprofessional and lifelong learning, including CE.

Regulatory

Third, recommendations are made to the accrediting bodies. In health care, these recommendations support workplace and lifelong learning by establishing appropriate and supportive accreditation standards. In CE, the recommendations encourage the inclusion of diverse, evidence-based methods for the delivery of continuing education, including integration into practice, and delivery in the workplace and other more non-traditional settings. Similarly, undergraduate educational accrediting bodies responsible for entry-level or pre-practice learning are encouraged to support the development of lifelong learning skills and to recognize workplace learning in undergraduate and basic health professional education.

Section 1: Background Achieving Consensus in Continuing Education and Lifelong Learning

INTRODUCTION

The Josiah Macy Foundation's (JMF) November 2007 conference on continuing education in the health professions has raised public and professional awareness regarding the need for change in this last and longest phase of health professionals' education(1). Recommendations from the 2007 report built on previous reports (2-10) in the field and articulated recommendations in two major areas: the need for a complete separation of commercial interest from all accredited continuing education (CE) health professional activities and a reform of the accreditation of continuing education. These recommendations have generated widespread attention. However, less publicized but important recommendations from the 2007 JMF Report emphasized the development, testing, and support of a more effective model of CE and increasing the linkage between CE, competency, and performance. The 2007 Macy Report, *Continuing Education in the Health Professions*, may be found at the following web site: www.josiahmacyfoundation.org.

With its long history of activity in medical education, the Association of American Medical Colleges (AAMC) has issued several reports related to this area. Included in them are items that fall under the rubric of its Medical School Objectives Project (MSOP), of which a number are related to undergraduate education reform (e.g., MSOPs on the quality of care, 2001; rational prescribing, 2008; and informatics and information management, 1998). Similarly, the American Association of Colleges of Nursing (AACN)—through a series of initiatives and reports—has reexamined how nurses, from entry into the profession to advanced specialty practice, are educated for lifelong learning to meet the future needs of the population and healthcare system. Policy statements regarding nursing education (including requirements for professional certification [11], preparation on for entry into the profession [12], and advanced practice preparation at the doctoral level, [13])have been developed and endorsed by the AACN membership. These reports reach consensus about the need to re-examine how health professionals are prepared for lifelong learning and the need for changes in how lifelong learning is implemented.

The Institute of Medicine (IOM) in 2003 released *Health Professions Education: a Bridge to Quality,* which called on the health professions to examine and redesign the way all health professionals are educated for the future to: deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics (10). Despite the promulgation of these and other reports and their recommendations, work remains to be done regarding the methods and formats of

continuing education, interprofessional education, and preparing future practitioners for lifelong learning to address the shifts in the nation's patient population, growing complexity in the healthcare system, and exponential growth of knowledge and advances in technology, biomedical, and related fields.

Despite the promulgation of these and other reports and their recommendations, sizable work remains to be done by the health professions regarding the methods and formats of continuing education, interprofessional education, and preparing future practitioners for meaningful lifelong learning.

This report is the product of a cooperative effort of a large number of individual stakeholders, representing a wide range of perspectives: from basic, undergraduate training to continuing education; from medicine and nursing; and from education, practice, and regulatory arenas. Hosted by the AAMC and AACN, this effort focuses on one set of the 2007 JMF recommendations- those related to the delivery of CE and the development of lifelong learning skills in health professionals. Funded by the JMF, it attempts to address issues of learner preparation and the delivery of continuing education in the cause of improved patient care – hallmarks of health care reform.

THE LIFELONG LEARNING INITIATIVE

The initiative encompassed three distinct phases.

Dates	Task
PHASE I	**PRELIMINARY WORK PHASE**
July 2008 – Sept 2008	Planning Phase
October 2008 – January 2009	Pre-Conference Phase: literature review
PHASE II	**INVITATIONAL CONFERENCE: REACHING CONSENSUS**
February 9-10, 2009	Invitational Conference held Alexandria, VA (Expert Panel)
February 11 – March 5, 2009	Document drafts sent to section editors
March 5– March 27, 2009	Edited drafts sent to working groups
March 30 – April 30, 2009	Draft recommendations and chapters to all conference participants for review
PHASE III	**FINALIZING REPORT & RECOMMENDATIONS**
May 13, 2009	Webinar for Invitational Conference Participants
May 14- 31, 2009	Finalization of report and recommendations
June, 2009	Presentation made to Interprofessional Organizational Leadership
August, 2009	Review by External review panel members
September- October 2009	Report dissemination, preliminary implementation

Phase I: The Preliminary Work Phase consisted of planning activities and researching the four originally identified areas upon which the lifelong learning initiative was built. In this phase, a review of the literature was conducted using various online databases such as EBSCO, Pro Quest, the Research & Development Resources Base in CE of the University of Toronto and CINAHL. For the search, key terms were used, including (but not limited to) Continuing Education, Point of Care, Lifelong Learning, Knowledge Translation, Technology Team-Based Learning, and Education. This research helped to assimilate a variety of peer-reviewed journals, articles and documents that provided a foundation for the development of white papers on the four major thematic areas. The white papers generated by this phase offered a synopsis of the literature, including issues, implications and recommendations surrounding these four major themes, and provided a basis for the work of the Invitational Panel in Phase II.

Phase II: Invitational Conference, "Reaching Consensus"

An invitational conference, co-hosted by AAMC and AACN, provided a central platform for the Lifelong Learning Initiative. Key representatives from nursing and medicine with expertise in the four identified thematic areas were invited to participate in this landmark initiative. In addition to the four areas, participants represented a cross-section of regulation, accreditation, education, and certification from both nursing and medicine. The work of this Expert Panel was inaugurated at a conference held February 9-10, 2009 in Alexandria, Virginia. The conference focused on a distillation of the recommendations in the white papers with a strong action orientation. The conference goal was to facilitate the development of working structures and initiatives to ensure the implementation of the final report and recommendations.

The specific objectives of the conference were to:

1. Develop and refine specific, actionable recommendations arising from the White papers or other expertise;
2. Outline barriers and facilitators and next steps to the execution or implementation of these recommendations; and
3. Outline organizational and logistical frameworks to oversee their evolution, development, and assessment.

Conference Format

The conference agenda aimed to achieve its goals by a mixture of plenary sessions, large group and small group discussions, and an iterative process of developing and sharing recommendations.

The white papers provided a launch pad for discussion. Previous studies, including findings and recommendations, were clustered in four categories (see Figure 1). In each area, a brief description of current research findings was presented, followed by an exploration of their implications. Initially, four working groups were established: Continuing Education (CE),

Point of Care (POC), Lifelong Learning (LLL), and Interprofessional Education (IPE). As the work of the Expert Panel progressed, two of these groups were compressed into one (Continuing Education and Point of Care) re-labeled 'CE methods', and another group was established in Workplace Learning (WPL). Taking the term *point-of-care learning* to mean information retrieval at the time of a patient visit, the Expert Panel empowered a small group to address issues in this area, now considered to be a subset of workplace learning. Further definitions are listed in an appendix at the conclusion of this report.

Participants in each of the working groups were chosen based on their past work and identified expertise in one of the four major areas. However, Expert Panel members were provided an opportunity to self-select their work group if they felt more knowledgeable or interested in another area.

The conference format allowed the participants to dissect the white papers, and to generate a set of recommendations that continued to evolve both during and following the conference as the working groups and entire Expert Panel processed the information. Following the invitational conference, editors and writers from the individual work groups were identified to craft the initial draft of the report.

Phase III: Finalizing the Report & Recommendations

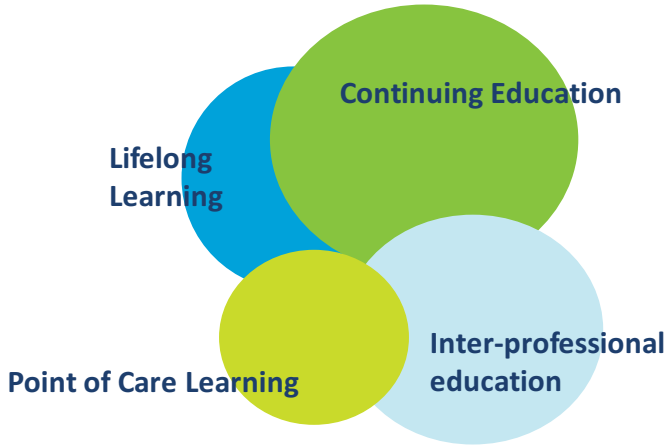
This phase included several individual steps with the ultimate goal of reaching consensus around a set of recommendations that would shape future actions related to Lifelong Learning. The first step brought the five work groups back together through electronic means, facilitated by ad hoc conference calls and online file-sharing. Individual recommendations were presented, discussed, and voted on by Expert Panel members via a final, summary webinar process. Following the teleconference and based on the consensus of the Expert Panel, a final draft report was completed.

In June 2009 a presentation on the initiative and recommendations was made by one of the project leads to the Federation of Associations of Schools of the Health Professions (FASHP). FASHP membership includes the leadership of 14 health-professions organizations.

In early August 2009, the final draft report was sent to members of an External Review Panel. Members of the External Review Panel, not members of the Expert Panel, included individuals and organizational representatives identified as having expertise in the five major areas in the report or having a significant stake hold in the successful implementation of the recommendations contained within the report.

This phase was occupied with answering key questions raised during the conference, and in shaping recommendations to key stakeholders. Both are outlined below.

Figure 1: Initial key constructs



Key questions addressed by Expert Panel

In the process of examining the roles of and potential impact on key stakeholders in the process of producing, accrediting, and supporting continuing education and lifelong learning, several important questions were raised and processed. In many instances, the group acknowledged that stakeholders had already begun to address these and similar questions.

- If there were no accreditation or credit systems, how would the professions monitor quality/accountability for individuals, teams and the system? One approach might be to document and monitor the health professional's progress in achieving learning goals: e.g., by portfolio-based activities, a process that could be consistent across professions
- What is the proper balance between current practices in CE and lifelong learning, captured by the term *evidence-based* vs. innovation?
- What funding would be needed to implement the changes recommended? Who or what entities might support the changes both monetarily and conceptually? What business cases, outlining values and returns on investment, need to be developed, in order to guard against the issue of unfunded mandates? Related to the issue of funding are serious questions about commercial support, conflicts of interest, bias and ethics in continuing education.

- To support changes in continuing education practices, how can creative, innovative, and personalized faculty development best be implemented and supported?
- To what extent do we support the research and development aspects of CE: How can the published results of these studies be more widely disseminated or implemented?

Stakeholders in Continuing Education and Lifelong Learning: Securing External and Logistical Support for Change

To achieve a changed or future vision of Continuing Education and Lifelong Learning, broad support is needed from those stakeholders who play significant roles in shaping the ongoing education and learning of health professionals, both in academia and in practice. These stakeholders and the roles and challenges envisioned include:

- Licensing bodies and credentialing boards; possibly altering requirements for the demonstration of competency in both academic programs and in continuing education;
- Educational accrediting bodies, examining:
  - the role they can play in supporting the creation of effective, critically thinking lifelong learners;
  - their effect on CE access, funding, and accountability; and
  - their influence on fostering or inhibiting innovation.
- The leadership and faculty, including health science librarians, of academic institutions assessing ways in which they foster, support, and reward activities leading to the development of lifelong learners and provide more effective CE;
- CE providers–professional organizations and individuals advancing the professional development of CE and lifelong learning;
- Specialty and professional societies examining their role in moving from reliance primarily on didactic sessions to one of supporting a variety of lifelong learning formats;
- Health care accreditation systems and other stakeholders in the healthcare arena, including hospitals, health systems, payers, state, and federal governments assessing their role in supporting and implementing these recommendations.

Section 2: The Process, Value and Outcomes of Continuing Education and Lifelong Learning

REPORT OVERVIEW

The work of the Expert Panel (see Conference Participants and writing group members) developed two sets of issues and recommendations: 1) broad, overarching recommendations that are included in this section; and 2) more specific recommendations focused on each of the five major themes identified in this report: Lifelong Learning, Interprofessional Education, Continuing Education, Work Place Learning, and Point of Care Learning. Each of these areas is addressed in greater depth in subsequent sections.

The consensus conference permitted a rich discussion of the vision, mission, and value of continuing education and lifelong learning and formed a consensus surrounding these critical principles, thus providing a foundation for the discussion and evolving work of the Lifelong Learning Initiative. The Panel attended to the central construct of the learner, and the skills of the competent and supported lifelong learner. It then shifted its attention from the individual learner to the team in which practice does or should occur and subsequently developed an enriched understanding of the methods, resources, and activities of lifelong learning and continuing education delivery. Lastly, the Panel considered the setting in which practice and learning come together - the broader construct of workplace learning and its narrower but important subset, point-of-care learning.

THE VISION AND VALUE OF CONTINUING EDUCATION & LIFELONG LEARNING

Meaningful health care reform and its implications pose many challenges for health professionals and the healthcare system. These include, among other issues, advancing healthcare quality, delivering safe and cost-effective patient-centered care, increasing access to care through the use of information/communication technology, changes in insurance coverage and effective use of the health professional workforce (10). Geographic variations and workforce shortages pose additional challenges to achieving healthcare reform.

Realizing these expectations cannot occur absent commitment to and reinvestment in individually focused and team- and organizationally based lifelong learning and continuing education. Where learning organizations exist, teams and individuals practicing in those settings are exposed to feedback and improvement practices, which enrich individual knowledge (14). Similarly, teams and organizations appear to function optimally when

individuals come to those settings prepared to offer perspectives and competencies to advance clinical care and able to be engaged in systems that support that care.

Considerable attention is given in this report to the evidence of effect of continuing education on the competence and performance of health professionals and on the health care outcomes of their patients. Lifelong learning and its partner, continuing education, thus offer not only enriching but also essential elements to healthcare reform.

In this report, considerable attention is given to the effect of continuing education on the competence and performance of health professionals and on the health care outcomes of their patients. The Panel noted that several shifts in thinking had begun to occur over the years leading up to this report. First, the work of Rand and others had illuminated the nature and size of the clinical care gap (15, 16). Second, continuing education providers, in response to systematic reviews of the literature (17-21), had begun to augment didactic teaching methods with interactive and other adult-learning techniques. Third, and perhaps most importantly, two recent systematic literature reviews of the effect of continuing education (at least for physicians) have confirmed that educational activities—when undertaken using interactive, multiple methods and sequencing techniques—can change provider behavior and health care outcomes while maintaining competence, knowledge, and skills (20,21).

Healthcare professionals have important roles in addressing the issues of lifelong learning and continuing education and should be equipped to work and make decisions *in partnership* with patients, caregivers, families, interprofessional care teams, policymakers, and others. Lifelong learning and its partner, continuing education thus offer not just enriching but essential elements to healthcare reform. To assure their effectiveness, the skills of lifelong learning demonstrated by individual health professionals require rigor and support from initial professional education to the point of care for individuals, teams, and across organizations. Further, continuing education methods should embrace clinical systems, and complexity concepts using the best available evidence; and its provision demonstrate a high level of innovation, accessibility, effectiveness, timeliness, and relevance to healthcare practice and to the learner.

Although not the focus of this report, funding models to support and research to advance the science of learning are required to ensure implementation and adoption of the report's recommendations. This report provides recommendations and policy guidance developed by the Expert Panel to move to a preferred vision for continuing education and the education of the skilled lifelong learner – necessary ingredients to achieve recognized and emerging health care improvement and reform priorities.

Value of Lifelong Learning

All health professions value – as both a construct and a reality – the notion of lifelong learning and the need for continuing education. For the most part, health professionals are 'hard-wired' with a desire to perform with competence and confidence – essential to the lives they touch. In this sense, the Panel suggested that no health professional wants to deliver less than state-of-the science care, nor disappoint those entrusted to their care.

Yet, paradoxically, as knowledge expands to better serve the public, so too has the complexity of keeping up to date and the patient, family, and community dynamics that intersect with an increasingly complex healthcare system. Rather than reducing these burdens and enhancing professional identity and preventing burnout, continuing education has frequently been viewed by practitioners as another task to accomplish within an inflexible system. These and other forces compelled the Panel to look closely at the value of continuing education to society, health care delivery, and to the health professions themselves. The lifelong learning and continuing education models presented in this paper are conceptually linked to enhanced professional identity and value, joy in learning, thus aiding the provider and enriching the disciplines.

The Value and Purposes of CE and Continuous Learning

One current view of CE is to judge its effect solely by an individual's practice or performance change. In addition to this view, the Expert Panel explored the value of continuing education activity in a broader context. The Panel argued that health services research findings that suggest continuing education doesn't work provides a limited perspective on the relevance and importance of CE. Further, the Panel argued that participation in CE had value in itself by ensuring that one's practice was current, developing contacts with other health professionals, learning about the health system in which one practices, and enhancing self-efficacy. All have value beyond changes in performance or health care outcomes.

The Expert Panel instead urged an emphasis on the role of CE in:

1. Validating individual practice and competence;
2. Engaging learners in new knowledge and skill acquisition for practice setting application;
3. Reducing or closing practitioner-identified performance gaps;
4. Improving patient care outcomes;
5. Affording the opportunity to integrate knowledge, performance, competence and judgment; and
6. Generating professional satisfaction and identity, potentially preventing or decreasing burnout.

A VISION FOR CONTINUING EDUCATION AND LIFELONG LEARNING

Recognizing that the overlapping, broad concepts of continuing education and lifelong learning deserve a variety of perspectives, Expert Panel consensus developed around five major themes, replacing the four outlined in the initial white papers and 2007 Macy Report (1) (see Figure 2). In addition to these five major areas of focus, several important, cross-thematic considerations were agreed upon in broadening the conceptualization of continuing education and lifelong learning. These considerations are presented here as necessary ingredients in the reconceptualization of CE and lifelong learning:

- A broader definition of continuing education
    - in particular the acronyms CME and CNE used by medicine and nursing respectively appear to lead the reader to a more traditional and less broad understanding of the field
    - including only 'formal' or 'traditional' CE appears to limit the use of the term, leading to confusion relative to credit systems, and impeding innovative thinking related to CE
    - specificity is needed regarding the type of educational/learning method or intervention;
- Incorporation of the principles, recommendations and messages of this report into basic or undergraduate health professional training; and
- Application of information technology to each of the five focus areas.

The need for ongoing learning throughout a health professional's career was widely supported; however, there was consensus among the Expert Panel that a simple readjustment of current polices and thinking regarding CE was insufficient to address healthcare system needs, reforms critical to improving care gaps, and concerns about the state of American healthcare, matching the conclusions of others (16).

Several issues highlight the challenges and limitations to the form and structure of the current CE system:

1. Growing complexity exists in the contemporary work environment. Current, 'traditional' approaches to health professionals' education may not fully develop the skills required to address the contingent nature of the work and the distributed expertise in the work place.

2. The unrelenting increase in biomedical (e.g., genomic and proteomic) information highlights the need for better information retrieval and knowledge-management skills – termed point-of-care learning.

3. Limitations to the current approach to CE and the selection of learning activities with little or no objective feedback to participants contribute to variations in health care. Most health professionals attend CE activities as single or self-contained events based on perceived learning needs that may not reflect real gaps in care or knowledge, or practice performance.

4. CE activities frequently do not provide information in a format that permits easy application to one's practice, offer opportunities to practice using the new information, or receive feedback about one's practice.

5. Despite the evidence and acknowledged potential for improving the processes and outcomes of care, there remains a generalized lack of focus on interprofessional CE learning experiences.

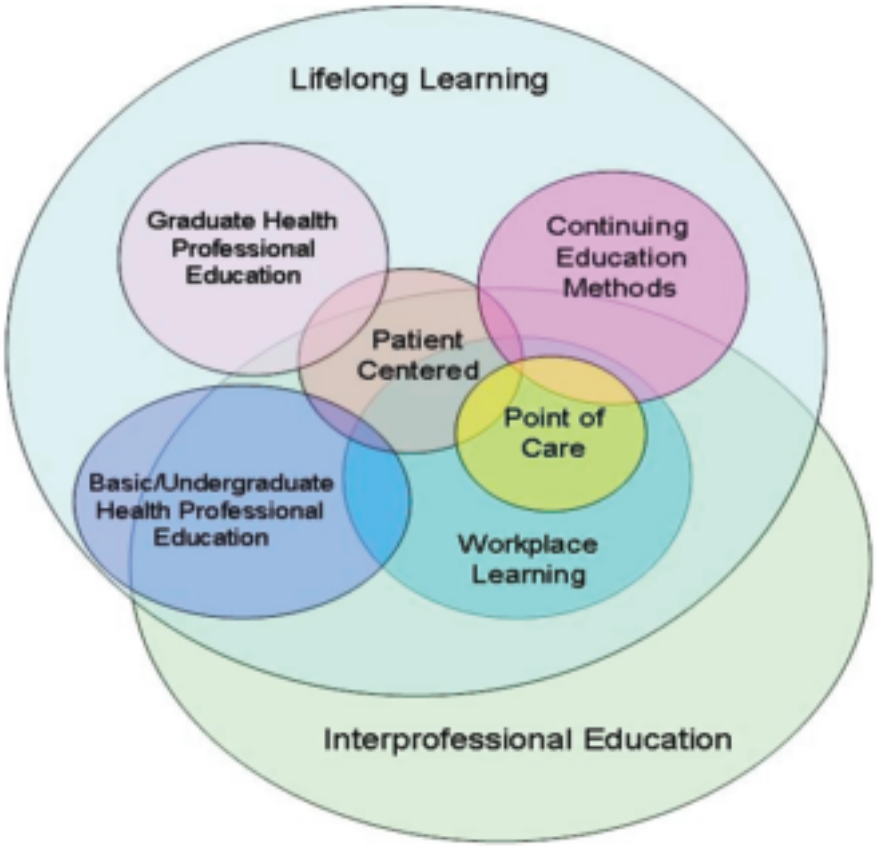


Figure 2: Finalized Key Constructs of the LLLi

THE PROCESS OF LIFELONG LEARNING: PREPARING AND SUPPORTING THE LEARNER

The process of lifelong learning represents both a value of the health professions and a complex, critical competency.

The process of lifelong learning presents multiple facets. On the one hand, it may be viewed as a value embraced by the broad health professional community. On the other, it may be seen as a behavior advocated by health professional organizations and adopted by individual health professionals. Pre-professional education and life experiences may lead to an individual's adoption of lifelong learning as a value and the development of skills needed to translate the value into behaviors. Despite whatever level of valuing or skill in lifelong learning a student brings to his/her educational experience, it is expected that basic health professional education produces an accountable professional with learning skills

internalized as a core value leading to optimal knowledge management, self-appraisal, information retrieval, and critical appraisal. Further, it is expected that each professional program will provide students with multiple opportunities to develop the essential skills to identify, prioritize and embrace learning, and translate learning into professional behavior throughout their careers.

THE PROCESS of WORKING AND LEARNING TOGETHER: INTERPROFESSIONAL EDUCATION (IPE)

Interprofessional education refers to the teaching and learning of individuals from different professions together during all or part of their professional training— and in practice—in order to promote collaborative working in their professional practice (22).

The last three decades have witnessed a growing emphasis on creating an integrated healthcare delivery system requiring health professionals to collaborate in an effort to improve patient care. Despite this emphasis, much of health professionals' education and practice remains in silos, hindering integrated collaborative care and shared knowledge and experience (23-25). Although interprofessional practice and education have become priorities in national and global health policies (26, 27), the development of interprofessional education (IPE) and practice models has been slower in the U.S. than in many developed countries (27).

In these decades, IPE has been recognized internationally by many health- and social-care disciplines as a tool to improve health professional collaboration and healthcare delivery in many areas (24, 25). IPE programs have been endorsed by academic institutions, policymakers, and governmental agencies based on the tenet that learning together creates a better partnership (28). Further, research has shown that IPE and interprofessional (or interdisciplinary) collaborative care improves efficiency and efficacy of patient-centered care (29).

In these studies, IPE appears to maximize the strengths of individual disciplines within the integrated delivery of relevant and optimum care. While the benefits of implementing IPE programs may be well recognized, its implementation is not without challenges. For successful IPE, all stakeholders (including health professional organizations, policymakers, insurers, academic institutions, CE providers, the public, and licensing and accrediting bodies) need to embrace a multi-professional framework of and a shared value for IPE. Any effective IPE model should be patient-centered and nimble, and provide a required and measurable component across the health professional educational continuum, from entry and throughout one's practice career. In addition, innovative methods for engaging in interprofessional education need to be designed and tested in order to provide opportunities for health professional students in diverse institutions and settings to participate in interprofessional education in a meaningful way.

CONTINUING EDUCATION METHODS AND ACTIVITIES

Complementing and supporting the construct of lifelong learning, and for many decades the mainstay of CE in nursing and medicine, are the traditional, formal 'products' of continuing education: conferences, rounds, courses, lectures, and in-service training. When most people think about education and learning, they conceive of such formal offerings (e.g., a teacher who instructs a group of learner-clinicians as part of an institutionally pre-determined curriculum). While other educational venues may come to mind, the default picture of continuing education is a formal transmission of a pre-determined body of knowledge. These activities are frequently provided with designated accreditation and generate 'credits' for practitioners, necessary for most state licensure and other credentialing processes. The literature highlights the generally positive role of CE in acquiring knowledge, skills and attitudes, and, to a lesser extent, in affecting behavior and patient health outcomes (20, 21, 30).

For years, concern has been raised about the impact of formal, classroom-style continuing education on practice performance or healthcare outcomes, (17,19) when delivered in didactic, non-interactive modes. While confirming this finding, the Panel suggested that such methods are not without merit, however, and may communicate new or reaffirm previous knowledge. More recent systematic reviews (20, 21) confirm much of this evidence but suggested that well-designed educational activities employing a variety of educational methods, better needs assessments and design can alter clinician behavior and even health care outcomes. These activities of workplace learning build on well-developed constructs of organizational learning, learning communities and communities of practice.

Given earlier evidence about more 'formal' didactic education, it is not surprising that authors have generated a list of broadly defined educational interventions beyond the course or conference model. Generally considered to be more effective than didactic methods, (31-34) these interventions employ pro-active techniques and strategies to effect learning and change in health professionals. Among other methods, they include: community- or practice-based efforts, e.g., academic detailing, opinion leaders; computer-generated reminders, protocols and decision-support systems; clinical database-driven audit and feedback methods; and multi-faceted educational programs/activities (see Table 5.1 in Section 5). Both accredited CME and CNE providers have begun to adopt some of these measures.

Despite evidence for their possible effect, the use of more interactive and learner-centered activities in planned conferences and other more interventionist approaches pose several challenges. Frequently developed and tested in research settings, such innovations may be infrequently used on a widespread basis, due to cost and other factors (35). Exceptions may be found in programs funded by insurers or government agencies interested in academic detailing, train-the trainer and other programs. To expand the integration of and obtain funding for more interactive, learner-centered interventions, CE providers should broaden their competence in educational design, evaluation, and execution and be able to articulate the benefits of these interventions in improving healthcare outcomes. Faculty members responsible for the delivery of CE need to develop new skills and strategies for using these learning methodologies. Finally, potential funders of such programs, such as insurers and state and other government agencies, should be made aware of the potential of such

interventions to decrease costs and increase quality, safety, and the delivery of evidence-based practice.

EXPANDING SETTINGS FOR LIFELONG LEARNING & CONTINUING EDUCATION: LEARNING IN THE WORKPLACE AND AT THE POINT OF CARE

Learning in the Workplace

While formal education with a pre-determined curriculum may have prepared students to enter the world of work in the 20th century, concerns have been expressed in non-health professional vocational and professional education literature that this type of education may not prepare people for work in contemporary society, increasingly characterized as a collection of complex adaptive systems. The Expert Panel defined workplace learning as "the way in which individuals or groups acquire, interpret, reorganize, change or assimilate a related cluster of information, skills and feelings, and a means by which health professionals construct meaning in their personal and organizational lives" (36).

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Such systems comprise collections of individual agents with freedom to act in frequently unpredictable ways, and whose actions are interconnected so that one agent's actions change the context for other agents. Such systems transform the nature of today's work environment from relatively routine tasks to problems and challenges that are characterized as contingent (37). This contingent nature requires workers to go beyond previously learned "scripted" approaches to resolve novel and poorly defined work challenges. In this environment, skilled performance in the work environment reflects the expertise that is distributed among the members of a group or team. Because successful performance appears to be dependent on factors not yet known or predictable, workers are confronted on a regular basis with problems and challenges not adequately addressed in their formal education program. They continuously add, replace, enhance, and retro-fit their expertise, as changes in technology and work processes gradually eliminate the need for skills they learned previously and necessitate the development of new ones.

To address the learning needs of health professionals working in today's complex health care environment, the Panel proposed the concept of a *disruptive* learning system. Coined by Christensen, disruptive innovation describes simple innovations or changes that unexpectedly provide alternatives to the traditional and displace an established practice (38). Use of the term disruptive indicates that the learning needs of health professionals working in today's complex health care environment cannot be met by merely fixing pieces or small components of the current approach to health professionals' CE. Reflecting this disruptive approach, the Panel suggested that sizable efforts be undertaken by health care organizations, health care systems, CE providers, and other stakeholders to ensure the adequate incorporation and testing of workplace learning strategies in health care settings.

Point-of-Care Learning

Point-of-Care Learning, a subset of workplace learning, was defined by the Panel as learning that occurs at the time and place (whether virtual or actual) of a health professional/patient encounter.

Point-of-Care Learning—seen by the Panel as a subset of workplace learning—comprises activities occurring at the time and place of a clinician-patient visit, and therefore is most often distinguished by its context; the active encounter between the clinician and the patient in the healthcare site, home, or elsewhere. It is during this process that information needs are identified and the opportunity for clinician and patient education, clinical decisions, and patient management intersect. The clinician-patient encounter traditionally has occurred face-to-face in a clinical setting; however, in this age of growing information and communication technologies and new approaches to healthcare delivery, point-of-care encounters may also include clinician-patient interactions such as telephone calls, email communications, and video conferencing.

Point-of-care learning involves the recognition of an information need generated by a clinical encounter. It also includes the use of biomedical literature or other information resources, ultimately providing an answer either at the time of the patient encounter or soon after.

ACHIEVING A VISION FOR LIFELONG LEARNING: GENERAL RECOMMENDATIONS

Vision for Health Professionals' Lifelong Learning

A vision for health professionals' lifelong learning evolved from the literature and more specifically from the Expert Panel and small group dialogue and work. The broad recommendations presented here grew out of this vision, and implementation is seen as requisite for the full realization of this preferred future.

In an era of mushrooming scientific knowledge, advances in technology, and health care reform placing a greater emphasis on interprofessional education while broadening the conceptualization of continuing education becomes paramount. The vision for health professionals' lifelong learning encompasses:

- Health professionals' education that includes significant interprofessional learning experiences in both the didactic and clinical components of the curriculum. Curricular experiences are designed and presented collaboratively, role-modeling interprofessional practice. Interprofessional learning and practice experiences continue throughout advanced training and clinical components.

- Graduates of health professional education programs have documented knowledge and skills that prepare them to engage in meaningful lifelong learning experiences throughout their careers.

- Interprofessional practice teams are implemented across the healthcare system and comprise the most common practice model.

- Health professionals have opportunities to engage in a variety of self-selected learning or continuing education opportunities to supplement knowledge and skills across areas of science and practice.

- Newly developed and tested technologies are used to deliver up-to-date, evidence-based information directly to health professionals in all practice settings and to document changes in practice and patient care outcomes.

This vision for a preferred future of lifelong learning and continuing education lays out a vision, collaboratively developed by experts and stakeholders in education, practice, and regulation from across the health professions' community, and a path for achieving this vision with new focus on critical components and actions identified as necessary to address many of the issues currently facing the healthcare system.

The broad recommendations advanced by the Expert Panel address identified barriers or issues that may impede the development of a new model for lifelong learning in the health professions. Many of these impediments mirror a response to any change, but others are specific to health professions' education, practice, and regulation. Issues addressed by the Panel included insufficient financial and logistical support for lifelong learning and continuing education; lack of uniformity in health information technology; emphasis on hours of credit and other requirements imposed by regulators, including licensing, accrediting, and certifying bodies; the enormous size of the current CE enterprise; CE payment systems; individual practitioner inexperience with self assessment; and the lack of effective qualitative and quantitative tools to measure the impact of CE on practice.

More specific recommendations related to each of the five focus-areas are addressed at the end of each subsequent section. In these five sections, recommendations are also addressed to the specific entity or organization impacted by the recommendation.

2.1 Health professions' organizations, CE providers, faculty, and others should assimilate and disseminate evidence to the public, policy makers, and regulatory agencies that CE and lifelong learning contribute to improved health care quality and safety, cost-effectiveness of care, and improved access.

Policymakers at all levels, including healthcare systems, payers, legislatures, and government, need to consider the importance of lifelong learning relative to its contribution to improved quality, patient safety, provider retention, cost-effectiveness, and overall impact on the health care system. Support by these bodies for the development and implementation of lifelong learning skills and CE activities consistent with these principles is critical.

To achieve this goal, the health professions should advance efforts to advocate for research and disseminate evidence—where it exists— about the closing of clinical care gaps by educational means. Narrowing the gap between best evidence and current practice, or between desired and actual performance, shown to improve patient outcomes, requires

individual clinicians, practice groups, and the professions to identify and generate meaningful, evidence-based CE content that addresses the needs of the public, patients, health professionals, and an integrated healthcare system.

This process would highlight and advocate for the value and cost-benefits of CE and lifelong learning; and would serve to identify the roles of CE in professional self-regulation, protection of the public, and improving systems of care. The Panel indicated that the identification of gaps in care and effective strategies for promoting change in practice would support the core principles of effective CE and lifelong learning: connecting CE to practice realities, patient needs, providers and health systems. In addition, the process would address individual, team, and system-based learning across all health professions.

2.2 Health professions, the academic institutions that prepare clinicians, the regulatory bodies responsible for overseeing the basic, continuing education and licensing of clinicians, and the care facilities that employ them, should embrace a new construct of lifelong learning that includes the development, fostering, and testing of knowledge management and related skills.

Such skills are essential elements to effective clinical practice, necessary from entry to health professional education through one's practice career.

This new construct would reinforce or require collaboration among health professional organizations, higher education institutions, healthcare organizations, and regulatory bodies that support lifelong learning of health professionals within today's changing healthcare system.

2.3 Health professions organizations, academic institutions, policy makers, insurers, CE providers, and regulatory bodies should embrace an interprofessional education (IPE) model or construct. This model would be patient-centered and flexible and encompass a significant and measurable component across the educational continuum from entry into health professional education throughout one's career.

Achievement of this recommendation would require the development of a national vehicle for fostering IPE that builds on and consolidates the work of current interprofessional education-focused groups. The process of developing a national framework would create a shared vision and value for IPE and provide an interprofessional dimension in health professions' research, education, and practice. To accomplish this goal, the Panel recommends:

- An examination of existing and the development of new models that define the roles and responsibilities of healthcare team members and serve as a foundation for health professions' educational reform, research, and collaborative decision-making, professional development, clinical recognition of contributions to care, and advancement of the science and application of collaborative, interprofessional patient care;

- The formation of organizational infrastructures to foster the development of IPE initiatives that address the IOM teamwork core competency;

- The creation of a national standard for IPE as a core competency for all health professionals' education; and,

- Enhanced support for evidence-based IPE education and research that can be translated into practice and the workplace (23).

This recommendation includes the establishment of national leadership, a process and structure that would unite disparate and disconnected interprofessional education, research, and practice efforts at the individual, institutional, and national levels to promote dialogue and shared learning. This process could include:

- A national summit for identified stakeholders engaged in efforts to foster IPE across the educational continuum. The purpose of the summit would be to develop a shared agenda, identify individual contributions to IPE and best practices, and craft a plan for furthering IPE.

- Synthesis of national, consensus-based IPE models, incorporating clarification of roles and responsibilities of each health profession, and dissemination of these models that integrate and communicate approaches to education and care delivery among the health professions;

- Building a discursive mechanism within academic institutions and practice settings to create awareness about the issue of power in education and practice settings (39).

- A networking tool to disseminate standards of IPE metrics and outcomes at the clinician, micro-, and macro-system levels;

- A health professions' education research institute that incorporates examination of IPE approaches and their impact on health professions' education and healthcare outcomes across the continuum of care; and,

- A platform for addressing legal, sociopolitical, and other impediments to effective IPE and team-based care.

2.4 Health professions organizations, policymakers, the public, regulatory bodies, higher education institutions, and CE providers should continue to investigate and implement the most effective CE methods to support providers, practices, and health systems in order to integrate and improve healthcare quality and safety.

The Panel iterated that such a process would support the development and use of more effective CE methods by building on adult learning theory and testing new and creative methods and strategies, most likely within the framework of an institute or similar body for CE in the health professions. The information gleaned would provide evidence to refine the use of provider feedback mechanisms, electronic health records, and other point-of-care tools to improve performance and healthcare outcomes.

It is equally important that accrediting bodies recognize the relative value of CE methods in achieving differing goals or outcomes. To do this, these bodies should consider the emphasis placed on lifelong learning in the academic or practice organization and examine the extent to which these institutions or organizations provide resources to support educational activities leading to measurable lifelong learning skills.

2.5 Higher education and healthcare institutions, professional organizations, and others should fund and in other ways support the development and re-education of CE providers to achieve the goals of a newly envisioned, cost-effective CE system and to support effective lifelong learning across the health professions.

The Panel believed that the professional development of CE providers and faculty members would ensure a broad understanding of the healthcare system the importance and effectiveness of CE methods, as well as the need for interprofessional education and workplace or point of care learning. Further, professional development activities would enhance skills in data use to foster performance improvement, critical skills to influence system administrators and organizational culture, and methods to improve collaboration between clinicians and administrators.

2.6 Health system leaders, payers, regulatory agencies, and CE providers should recognize the potential contributions to quality and delivery of care based on best evidence, and support the increased development and use of work-place learning strategies, including point-of-care learning.

To accomplish this goal, the Panel suggested that an extensive dissemination and public relations effort should be undertaken to help policy makers (at the institutional, state, and federal levels), private and public insurers and other funders, and individual health professionals understand the value of ongoing, evidence-based workplace learning. While classroom-based CE and work-based learning are complementary to this process, redistribution of resources to ensure the viability and impact of work-based learning is vital.

2.7 Health professions organizations, healthcare delivery systems ,and regulatory bodies should embrace point-of-care learning strategies. This includes the facilitation of research on such learning strategies, including self-assessment mechanisms and the use of required technological approaches to improve practice and the streamlining of credit systems for point-of-care activities.

Section 3: The Competency of Lifelong Learning

BACKGROUND

Lifelong Learning as a Construct

Lifelong learning was defined by the Expert Panel as the "voluntary and self-motivated" pursuit of knowledge for either personal or professional reasons (40). In the Panel's view, it comprises an ability to: reflect on one's practice and thereby determine learning needs; efficiently and accurately search for learning resources and critically appraise them; apply these resources to clinical and other questions; manage large and changing bodies of evidence; and evaluate one's competencies and practice based on internal and external feedback. The Panel expressed the belief that this construct was somewhat distinct from current models of basic education, which stress knowledge acquisition and retention.

Lifelong learning was viewed by the Panel as the "lifelong, life wide, voluntary, and self-motivated" pursuit of knowledge for either personal or professional reasons. As such, lifelong learning enhances social inclusion, active citizenship and personal development. The construct has gained increased attention in the health professions, a product of the accelerated pace of developments in the science and technology of health care and growing concerns about maintaining and enhancing quality of care in an increasingly complex practice environment. The Panel suggested that the process of lifelong learning can bring personal satisfaction and even joy to learning and practice, can enhance professional identity and value, and may prevent burnout.

The Value of Lifelong Learning

Lifelong learning can be viewed in two ways: first, as a value embraced by the broad community of health professionals and, second, as a behavior advocated by health professional organizations and adopted by many individual health professionals. Its value and acceptance is modified by pre-professional experiences, which may lead to an individual's adoption of knowledge management, information retrieval, and related skills. Valuing these skills is a necessary precursor to the translation of evidence into practice.

The Competencies of Lifelong Learning

In an ideal world, the process of completing a professional program would ensure that lifelong learning competencies were a key component of what it means to be an accountable, self-directed professional. The competencies of lifelong learning include several components: the ability to reflect on one's practice and thereby determine learning

needs; the ability to efficiently and accurately search for learning resources and critically appraise them (41, 42); skills in applying these resources to clinical and other questions; the management of large and changing bodies of evidence; and the ability to evaluate one's competencies and practice based on external feedback. Professional education programs hold a key role in providing students with multiple opportunities to develop these and other skills in order to continuously acquire evidence and translate it into professional behaviors.

The importance of developing and maintaining these skills throughout health professionals' working lives has been stressed in both the nursing and medical literature (43-46). The Panel discussed two aspects to achieving this aim: 1) creating a sustainable educational infrastructure with strategies to assess, support, and facilitate lifelong learning needs throughout health professionals' working lives; and 2) adapting current academic curricula and experiences to generate and assess self-directed learners with skills in knowledge acquisition, appraisal, and application. The Panel believed that the latter issue was distinct from current models of basic education, which stress knowledge acquisition and retention.

While studies provide evidence of a strong interest in continuing education among nurses and other health professionals at the individual level (47), they also suggest that lifelong learning should extend beyond individual desires and be supported by health professions' schools, healthcare organizations, and regulatory bodies. Some progress is being made in this area: for example, librarians work with educators to teach and assess competencies in information management and retrieval, but even more collaborative activity is required to develop common approaches across institutions and organizations (115). Additionally, lifelong learning requires alignment in health systems with safe practices and patient outcomes (10, 48, 49). Finally, at an early stage, lifelong learning skills need to be integrated into professional schools' curricula to ensure that health professionals are better equipped in knowledge acquisition, appraisal, and application (50).

Barriers to the full implementation of Lifelong Learning

Despite the strong evidence regarding the need for and role of continuing education and self-directed lifelong learning, sizable barriers to their full implementation exist. These barriers inhibit the full evolution of a system supportive of health professionals' lifelong learning. First, healthcare worker shortages and under-funding of CE programs within healthcare systems are widespread. Inadequate funding for CE development and programs is frequently reflected in the competing priorities of corporate educational systems, affected by regulatory bodies, higher education institutions, and healthcare organizations. Second, there exist differing mandates and priorities of healthcare authorities and professional bodies for lifelong learning, influenced by political, public, and organizational perspectives on the CE needs of healthcare professionals. Third, current knowledge about appropriate and effective curricula and traditional educational methodologies may limit the creation of learning situations conducive to the lifelong learning needs of health professionals. The rapid changes in professional knowledge and technology generate tremendous challenges for both the learner and the systems in which he/she works, including the educational, accreditation, certification, and care-delivery facets of these systems. A further challenge resides in the development of an integrated lifelong learning

system that is closely tied to patients' health outcomes, health system needs, and health professionals' competencies.

Continuing education should be considered from the perspective of how it could encourage the adoption of lifelong learning as an operating value, support the development of lifelong learning skills, and increase the possibility that relevant learning will be incorporated into appropriate professional decisions and behaviors. Encouraging academic and healthcare institutions and health professions organizations to develop sustainable, accessible, collaborative, health outcomes-focused lifelong learning programs is the focus of the following recommendations.

RECOMMENDATIONS

3.1 Academic institutions, curriculum designers and planners, faculty members, and others should develop, test, and refine curricula that emphasize and reflect the value of lifelong learning and incorporate lifelong learning skills. Their accrediting bodies should explicitly incorporate into standards and program expectations considerations of the extent to which programs foster and evaluate lifelong learning skills.

Along with institutional and professional accrediting bodies assessing the extent to which entry-level health professional education programs provide learners with and test lifelong learning skills, undergraduate and entry-level educational programs should also undergo reform. This latter process would include promoting educational curricula that focus on individual and group responsibility for self-directed learning while building a foundational culture of responsibility for externally guided continuous learning throughout the professional's working life. Such a process might include:

- Rebalancing health professional curricula towards an emphasis on knowledge management, self-assessment, and related skills;
- Developing and testing tools to assess lifelong learning skills, self-assessment abilities, and knowledge management competencies;
- Targeting lifelong learning to changing healthcare needs and practices; for example, addressing an aging and diverse U.S. population through interprofessional team collaboration; and
- Emphasizing information and communication technology usage to better prepare learners for learning throughout their careers. These technologies include those related to informatics, telehealth, computer-based instruction, virtual simulation, and others.(51)

3.2 Continuing education planners, faculty and teachers, and regulatory bodies (including accrediting, certifying, and licensing bodies) should value, comprehend, and support the principles of lifelong learning in education activities and their regulatory processes, including credit systems, standards, and assessment processes.

Achievement of this recommendation would require the incorporation of the following elements:

- Developing new business models that support learning, aligned with new CE opportunities, approaches, and methodologies;
- Designing CE activities to incorporate a broad organizing framework that addresses learning needs related to not just clinical but cognitive, interpersonal, moral/ethical, and skill development needs at the individual and system level;
- Targeting learning using social networking principles and balancing the use of simulation and technology with human interaction and mentorship;
- Incorporating real-time technology, using emerging approaches that have the capacity to increase accessibility for users and can provide for evaluation;
- Improving self-assessment through the use of metrics related to health professional knowledge, skills, behaviors, and healthcare outcomes across the educational continuum;
- Developing mechanisms for external validation and feedback from colleagues in similar clinical practices
- Evaluating and documenting changes in care processes and patient outcomes attributable to lifelong learning activities. Such strategies require attention to analysis of different systems' levels (micro, macro, and meso) with appropriately aligned metrics and efforts to avoid over and under-measuring
- Providing credit for these individual LLL, evidence-based CE activities.

3.3 Healthcare settings and systems, employers and their accreditation systems should support and incorporate the value of lifelong learning and the skills necessary to make its adoption a reality for the professionals associated with their organizations.

This process would safeguard opportunities in healthcare organizations for health professionals' lifelong learning (52). Health care organizations would be encouraged to determine and support the continuing education needs of the health professional staff and other employees. In addition, such a process would support the development of strategies that address a variety of factors that determine success in this area, including organizational, sociopolitical, and individual factors. Finally, achievement of this recommendation would establish an infrastructure for the lifelong learning of all healthcare professionals within organizations that:

- Meets the various needs of health professionals;
- Integrates the logistics of continuing education participation (time, financing and other factors) into the workplace;
- Supports the implementation of technology use and other strategies that foster partnerships and learning among health professionals;
- Measures the impact of CE programs on learning, practice changes, and patient outcomes; and
- Promotes workforce development, including attention to knowledge transfer, which captures the wisdom of experts at the micro- and macro-system levels to avoid the clinical and organizational consequences of lost knowledge.

Section 4: Interprofessional and Team-Based Continuing Education

BACKGROUND

Interprofessional approaches to care are not new. In the U.S., three decades ago, Halstead published the first review of the outcomes of interprofessional team approaches in the area of chronic illness and rehabilitation (53). Outcome studies of interprofessional care delivery in many other areas of care (e.g., primary care, mental health, geriatrics, critical care, chronic illness, and hospice care) have appeared in the literature subsequently. Implicit in the cyclical interest in interprofessional approaches has been their use in responding to critical issues in health care delivery. In rehabilitation, in geriatrics, and more recently, in chronic illness care, an underlying issue has been the need for complex, comprehensive care. In primary care, work force shortages, access to care for underserved populations, as well as family-oriented and preventive care needs have driven the development of interprofessional care models, including the creation and growth of the nurse practitioner role starting in the 1960's (54).

While many models of interprofessional care delivery have been generated, it was initial safety studies and the recognition in IOM reports (55) that poor interprofessional teamwork processes are implicated in patient safety and quality, that gave a new sense of urgency to efforts to generate evidence that improved interprofessional care processes, primarily in the high-risk [for error] areas of acute care institutions, would contribute to improving care outcomes.

Studies of the outcomes of interprofessional approaches have followed the cyclical re-emergence of interest in interprofessional models of care. Limitations of these studies typically have included the quality of design and measurement. Even with more rigorous research approaches, it often has been difficult to establish the structure(s) or process(es) that produced differences in outcomes because of the inherent complexity of the team intervention, the lack of attention to the variability quality of the intervention, and the "fit" between the nature of the intervention and the outcomes examined (56, 57). Conceptual limitations have included the view that interprofessional approaches are limited to "team" structures; that "teamwork" processes are synonymous with team structures (58); and that teams function in isolation from a larger institutional context. The development of work on clinical microsystems (59) and the properties of an institutional safety culture have helped to place interprofessional approaches to safe care in context, at least in institutional care settings.

Concurrent with the interprofessional practice movement, a growing interest in interprofessional education (IPE) has emerged. Interprofessional education (IPE) is defined as “any type of education, training, teaching, or learning session, in which two or more health and social care professions are learning interactively” (25). The definition includes both instruction in formal training programs and continuing education efforts, including workplace learning. However it is defined, interprofessional education the Panel suggested that it remains relatively underdeveloped and undervalued in health professions education and formal continuing education.

From a formal training perspective, IPE has been advocated as part of basic health professions training since the early 1970’s, concurrent with the emergence of federal structures and legislation to fund interprofessional demonstration projects. However, despite some compelling educational experiments (60), IPE remains on the margin of professional education silos as elective experiences reaching a small number of students. In the past, these students subsequently worked in settings where little attention was paid to interprofessional care processes. An IOM report in 2003 (10), in light of growing concern over patient safety and quality, recommended the integration of five competencies as core to all health professions’ education; one of these is these is competence to work in interprofessional teams. Other recommendations emphasized establishment of national goals for improvement in the core competencies, and the need for engagement and coordination of those in charge of oversight processes, such as those providing accreditation of educational programs, professional licensure, and certification bodies, to ensure that the core competencies were integrated into health professions education programs. Supportive training environments were advocated, along with the development of a stronger base of evidence in professional and interprofessional educational approaches, whose outcomes could be linked to improved patient care. Better measurement of core competencies, such as the ability to work in interprofessional teams, was viewed as an important part of strengthening the evidence base.

Other recent major national initiatives have contributed to the expectations for transformation in health professions education to address the five core IOM competencies. The Institute for Healthcare Improvement, through its Interprofessional Education Collaborative, introduced quality improvement training, and linked training for QI to interprofessional learning for members of the Collaborative (61). Partners for Quality Education, a long-term project of the Robert Wood Johnson Foundation, funded a series of initiatives that emphasized interprofessional learning, including ones that focused on managed care, and one on systems learning and quality improvement (62).

The first effort to address improved interprofessional processes for practitioners through explicit team-building interventions was published by Rubin and colleagues in 1975 (63), subsequently augmented by the introduction of team models from aviation safety and lessons learned about how to create high reliability human performance in high-risk circumstances. Efforts to incorporate interprofessional learning in the workplace often have been embedded in interprofessional quality improvement projects, with interprofessional learning implicit rather than explicit (63). More explicit attention has been paid to improving communication, teamwork behaviors, and care coordination in the workplace as a result of standard setting by The American Association of Critical Nurses (64) and the National Quality Improvement Forum, among others (65).

The gaps, errors, redundancies, and other problems associated with limitations of the structure and processes of interprofessional care (and implicated in poor care coordination) have become the target of team-building literature and programs in institutional contexts. They range from changing individual professional attitudes, skills (including communication skills and behaviors) to team-based interventions (such as interprofessional unit rounds) to large institutional culture change interventions, as well as the creation of checklists and technological "fixes" that can support improvements in interprofessional care processes (66-71).

Studies of these interprofessional structure and process improvement efforts have been subject to some of the same limitations as earlier work (25). These limitations are compounded by the problem of measuring safety outcomes reliably. However, the Panel noted progress, particularly in high-risk institutional settings, in refining our understanding of critical interprofessional care processes, such as communication processes and strategies for improving them (72, 73).

Barriers to Interprofessional Education

While there is evidence related to processes and outcomes of care to support the implementation of post-licensure teamwork training in healthcare delivery and documented learning outcomes for interprofessional education as part of the preparation of future health care professionals in our academic institutions, there are a number of challenges to the planning, implementation, and evaluation of IPE models in practice and education. Challenges listed by Headrick et al (74) include differences in: history and culture, in language and jargon, in schedules and professional routines, and in accountability, payment, and rewards; professional and interprofessional professional identity, and clinical responsibility; levels of preparation, qualifications, and status; and in requirements (75), regulations, and norms of professional education. Within academic settings, there are more specific barriers (76) including a lack of administrative support, financial and human resources for interprofessional education (72,75), conflicts in schedules and health professions' curricula, and limitations to the time required to plan and implement IPE faculty development for interprofessional learning (76). Finally, despite progress, there remains sizable regulatory and professional barriers to achieving full and meaningful implementation of effective IPE models.

SUMMARY

The benefits of implementing IPE programs are well recognized. However, for IPE to be effective and broadly implemented, the health professions, policymakers, insurers, academic institutions, CE providers, and regulatory bodies should embrace and adopt a new, IPE framework. These stakeholders should create a shared value and vision for interprofessional health professions' education, research, and practice. This vision should be patient-centered, nimble, and contain a measurable component of IPE across the entire educational continuum, from admission into a health professional program through retirement. Such a framework would maximize and value the strengths of individual professions in the integrated delivery of high quality care. Finally, in creating a successful IPE model, a series of questions should be considered: How best can team competence be measured? How should individual behavioral changes be documented when we think of individual rather than team-level changes? How do

we create and measure performance criteria based on shared understanding and experience in the practice setting?

RECOMMENDATIONS

4.1 Educators, curriculum planner and others should consider and incorporate meaningful, formal and experiential, interprofessional education in entry-level and advanced training of all health professionals. This should include, but not be limited to, curricular redesign, creation of experiential learning opportunities, evaluation of IPE activities, and design/implementation of IPE continuing education programs specific to work settings.

Evidence strongly supports the notion that interprofessional education be integrated into the culture of health professional academic programs to foster health professional collaboration in care delivery (77, 78). This culture shift would create a framework for health professions' education that incorporates and builds upon common values and goals related to patient-centered care, mutual respect, effective communication, knowledge regarding health professional roles and responsibilities (78), and behaviors that express cooperation, coordination, and collaboration. IPE curriculum planning should incorporate a determination of the types of interprofessional experiences appropriate for different learning levels, how these experiences can best be integrated into health professions' curricula and identification of core IPE competencies for all health professionals. IPE experiences should be dynamic and incorporate interactive activities.

To support the integration of IPE curricula and core competencies into health professions' education, several elements are necessary:

- Faculty and staff development that focuses on the development and implementation of interprofessional content and learning strategies needs to occur early in the development of an IPE curriculum;
- Health professional education accrediting bodies' identification of clear and meaningful standards for IPE that establish expectations, drive curricular change, and require performance measurement and translation into practice;
- Collective actions by interprofessional education, research, and clinical practice leaders should foster the testing of innovations and the subsequent modification of health professions curricula to foster IPE; and,
- Partnerships among health professional schools should facilitate exchange of resources and best practices, to promote IPE innovation and curricular development and to support the development of a common value base.

4.2 Organizations concerned with the assessment of competence, including licensing and certifying bodies, should develop and assess interprofessional team competencies in conjunction with health professional organizations.

Based on nationally agreed-upon core competencies, the development of a standardized assessment process would help determine health professionals' abilities to work effectively together and translate these knowledge and skills into practice. Further, a standardized assessment would create measurement and performance tools focused on effective team functioning including knowledge, skills, and attitudes of interprofessional communication, overall team performance, technical /clinical competence and an understanding of professional roles.

4.3 Continuing education providers, faculty members, and certification and CE accreditation bodies should support and create strategies for meaningful, outcomes-oriented IPE. These strategies should include streamlined curricula and program design and the development of certification processes to encourage IPE complementing the individual professional accreditation components and systems. In addition, standardized CE accreditation processes should address both intra and interprofessional educational and performance criteria that are not solely profession specific.

The development of IPE would articulate the individual, organizational, and system factors that need to be addressed to enhance quality care to patients. To achieve this goal, CE providers and health professionals, program faculty should create IPE experiences using effective learning methods that encourage knowledge-sharing and counteract preconceived notions among healthcare professionals. IPE should engage healthcare professionals, at both the individual and organizational levels, to deliver and demonstrate knowledge and understanding of the issues or problems that concern practitioners and consumers. The Panel believed that interprofessional CE can serve as the ultimate learning laboratory by providing a rich environment for integrated learning and application, and coordination of health professionals' work. CE methods may also include the use of communication technologies to create learning communities for planning, sharing, and exchanging knowledge. Through the adoption of these methods and policies, clinical educators, faculty, and administrators, as well as academic and health care institutions can affect IPE that is evidence-based and improves care outcomes.

Finally, accrediting bodies should attend to the development and implementation of meaningful accreditation and certification criteria that support outcomes-oriented, team-based care.

4.4 Healthcare institutions should create or collaborate to ensure multiple opportunities for meaningful, interactive health professional learning experiences that provide feedback on the health professional's performance. In addition, healthcare institutions' accrediting and regulatory bodies should incorporate requirements for IPE experiences into standards and policies.

This recommendation requires organizations that set professional standards for healthcare institutions, professional specialties, and academic institutions (including The Joint Commission, Centers for Medicare and Medicaid Services [CMS] and other healthcare accreditation bodies) to support the creation and implementation of performance measures that reflect intra- and interprofessional behaviors leading to improved patient outcomes. Further, the National Committee for Quality Assurance (NCQA), National Quality

Forum (NQF), and Agency for Healthcare Research and Quality (AHRQ) should engage in the development and implementation of performance and data tracking systems that reflect IPE frameworks at the individual and systems (micro/macro) levels and develop standards for IPE metrics and outcomes measurement that reflect these same individual and micro-macro-systems' perspectives.

Integrating IPE into health professionals' education and into their daily practices and schedules is critical. In this regard, IPE should be grounded in team-based and other collaborative practice models and subject to outcome evaluation, (79, 80). Investing in research to evaluate the efficacy of IPE and its impact on patient outcomes and the healthcare delivery system is inherent in this process.

Section 5: Continuing Education Methods and Activities

FORMAL or *CLASSROOM* CONTINUING EDUCATION

The heterogeneity of approaches to continuing education renders it difficult to identify precisely the nature, scope and impact of the CE enterprise. Recognizing this challenge, the Panel employed the term *classroom education* to describe a particular educational approach. Historically, classroom education has been focused on the didactic dissemination of information. Today, classroom CE – while often still didactic in nature – may encompass a number of interactive and enabling formats. These formats vary from passive, didactic, large-group presentations to highly interactive learning methods, such as workshops, small groups, and individualized training sessions (20, 21). In addition, the educational venue itself may include planned courses, conferences, symposia, rounds, and other in-person events, as well as broadcast approaches such as video- or audio-conferences and webcasts.

Any or all of these formats represent the ubiquitous nature of continuing education for health professionals, most often planned with the goals of maintaining and influencing professional competence. Classroom education comprises a major component of documented health professional learning in the United States.

In Medicine, when these events are sponsored by an organization accredited by the Accreditation Council for Continuing Medical Education (ACCME), the American Osteopathic Association (AOA), or the American Academy of Family Physicians (AAFP), attendance may be claimed for CE credit, a necessary criterion in most jurisdictions for the maintenance of licensure. A similar phenomenon occurs in nursing, although interstate variation for maintenance of licensure exists.

Despite its long-standing place as a cornerstone of health professional learning, modeled on undergraduate education methods, didactic models of continuing education may present several problems. First, throughout the large North American CE enterprise, educational planning continues to be driven by the self-reported interests of health professional learners, despite evidence that health professionals' abilities to self-determine their learning needs accurately without external feedback are problematic (43). Second, while didactic methods may impart new knowledge, systematic reviews demonstrate relatively little impact on provider performance; more interactive techniques appear to provide more benefit (20), yet are less widely used. Third, a commercial business model continues to support much of formal CE in the United States in medicine (35) and (though frequently to a lesser extent) in the other health professions, with a tendency to emphasize high-cost

therapeutic measures at the expense of issues of screening, prevention, communication, teamwork, and related issues.

Meeting these challenges, understanding which tools and techniques are effective in the context of classroom teaching and learning, and incorporating them into the fabric of health professional learning and accredited CE appears to be critical to improving the effectiveness of CE and diminishing the gap between evidence and practice.

Program Objectives and the Role of Needs Assessment

There are two issues of importance to the pre-planning of classroom education for practicing professionals – establishing appropriate learning objectives and determining learners' and system needs. For example, the ACCME requires that educational activities be planned on the basis of educational needs arising from gaps in practice (81). Further, there is variability in response to CE activities related to individual readiness to change. Clinician-learners frequently progress at their own rates, depending on their motivation, knowledge of a problem, or the perception of a gap between current knowledge and skills and those needed (82). Therefore, it is important to determine learning and system needs from both subjective and objective perspectives, recognizing that activities based on more formal objective assessments appear to have more positive effect (18).

Didactic, Interactive, and Other Methods to Augment Classroom Education

Classroom education can be modified to include interactive techniques to improve its effect in achieving performance change (83). While subjected to criticism about its failure to effect performance change, it is clear that didactic CE can increase knowledge, leading to awareness of new treatments and other findings, clearly an important objective of CE. In this process, the Pathman model may be useful as a construct (84): here, health professionals move from awareness of an innovation or new finding, through a stage of agreement, to one of adoption in which the new finding is incorporated and finally to adherence in which compliance with the desired change is complete. It appears that planning any CE activity using such a model allows for didactic methods to be employed with the objective of raising awareness, while allowing planners to understand that such methods may fail in the other, more outcomes-based domains.

One method that uses peer discussion and interaction is described by Nowlen (85) who stresses the role of the group in adopting new information, and by Bandura (86). The latter's Social Learning Theory stresses the importance of personal, environmental/situational, and behavioral factors. Such methods include: increasing and improving question and answer periods (e.g., by using electronic audience response methods); using case discussion methods; encouraging small groups to form within the context of large group sessions; role playing; brainstorming, quizzes, inviting patients to participate, among others (87). In addition, the use of multiple media techniques (e.g., simulations, videotapes, role-playing) may provide advantages over the use of a single technique (20), and multiple exposures to a topic appear more effective than a single exposure (19).

Post-Course Follow-Up

Some evidence exists to suggest that – among the educational techniques and media outlined above – there are some methods that can be distributed at the time of the educational activity, enabling the practice changes desired by course planners (ref: use of practice protocols). These include patient education materials, flow-sheets and other checklists to serve as reminders, and links to websites and other learning resources. Some CE providers have used email and other post-course methods to deliver to participants, materials or resources (such as printed educational materials or reminders), which is considered a passive dissemination strategy to improve knowledge and awareness (88).

ALTERNATIVES TO CLASSROOM EDUCATION

In contrast to classroom education, vehicles exist for more pro-active dissemination and implementation of new evidence, often in the form of clinical practice guidelines. Examples of such interventions include: outreach visits such as academic detailing; the training and deployment of educational influentials or opinion leaders to lead change at local levels; reminders at the point of care; audit of and feedback on clinical performance; educational materials; patient-mediated strategies in which the patient is enlisted as the vehicle to communicate information to clinicians; and other methods.

Alternatives to classroom education may be considered in the context of two key principles. The first of these is the use of education technology such as informatics, web-based learning, and other modalities. Although highly useful and important considerations, their development must allow for standardization in order to make learning, data collection, and assessment seamless. The second principle touches on the notion of ‘wrap-around’ learning, stressing that learning competency- and curriculum-based, rather than single, stand-alone activities that currently comprise much of continuing education. Such curricula can be delivered in a wide variety of formats, more effective when planned to meet true learner needs and practice gaps.

An Overview of Educational Interventions

A brief outline and description of several educational interventions were reviewed by the Panel to allow its consideration of ways by which such methods may be more widely incorporated into continuing education practices. Based on the Effective Practice and Organization of Care (EPOC) working group of the Cochrane Collaborative (33) the educational strategies are presented below in tabular format, highlighting the definition, evidence of effect, and literature sources. In general, it appears that alternative educational methods may be more effective in actively promoting the dissemination and possible implementation of best evidence, when compared to didactic educational strategies.

Table 1: Alternatives to classroom CE – point of care, educational interventions

Intervention	Definition Adapted from the Keenan Research Centre - Research Programs(89)	Evidence for Effect On performance & health care outcomes	Notes
Academic Detailing	A process of outreach in which physicians or other health professionals are visited by a knowledgeable health professional to discuss issues of use and (more often) overuse.	When trying to change how health care professionals prescribe medications, outreach visits consistently provide small changes in prescribing, which might be potentially important when hundreds of patients are affected. (90)	Several models exist in Canada and the US, funded by government and/or managed care organizations. Some models use academic detailing to effect change in preventive or screening practices.
Educational Materials	Publications or mailings of written recommendations for clinical care, including guidelines, audiovisual material, electronic publications (through the internet) and educational computer programs.	In general, mailed unsolicited materials appear to have little or no effect(88)	May be useful if short messages are captured in a graphically appealing manner; and/or if materials require self-study.(88)
Opinion Leaders	Individuals recognized by their own community as a clinical expert with well developed interpersonal skills and humanitarian attributes.	Intervention of variable effectiveness, ranging up to 25% positive change(91)	Widespread use may not be feasible, though interventions can promote evidence-based practice (91)

Patient-Mediated (PM) Strategies	Techniques which increase the education of patients and health consumers. These may be generic, health promotion educational activities such as media campaigns or more directed prevention and screening reminders to patients	Patient-mediated strategies have variable effect, occasionally producing significant change (18).	(PM) strategies can range from short reminder messages to patients up to complex shared decision-making. They appear to have potential to improve healthcare, especially if matched with messages to conventional health professional audiences.
Reminders Protocols & Checklists	Paper or computer-generated prompts about issues of prevention, diagnosis or management delivered at the point and time of care.	Consistently effective interventions(32,92) Reminders show promise of being an effective single change agent. Protocols and checklist demonstrate an effective change(95)	Questions remain about "reminder overload". Applications of checklists may be of significant benefit.
Audit/Feedback	A method whereby healthcare professional performance is measured and the results presented to the professional – generally in printed or electronic format.	Audit and feedback can be effective in improving professional practice. When it is effective, the effects are generally small to moderate (32, 93).	Limited by the extent to which a health professional leaves out details of care. Questions remain about the timing, nature of specificity of feedback (93).
Multifaceted interventions	Comprehensive programs designed to	Difficult to determine effect: dependent on mix	While some evidence exists to the

	improve healthcare practitioner performance or healthcare outcomes that use a variety of strategies. e.g., mailed materials, academic detailing, reminders and feedback targeted to the implementation of a specific clinical objective.	& strength of intervention in part -in general moderate effects (approximately 10%). No apparent relationship between number of interventions and effect(32,94)	input of such intervention, they are complex, often costly. There is some evidence that such interventions work better when targeted to barriers to change (95)

BARRIERS TO IMPLEMENTATION

The Panel recognized that it would be simplistic to suggest that all CE providers simply switch their modes of needs assessment and conference organization, or use unfamiliar educational strategies, to comply with the literature on effective continuing education methods. The Panel identified at least two primary challenges to the implementation of such strategies:

- The need for a reasonably extensive faculty development process, which would increase and enable teachers', in health professions and continuing education programs, familiarity with interactive and other practice-enabling techniques; and

- Modifications to the structure and planning for formal or newer methods of CE, possibly aided by changes in the credit and/or accreditation systems.

The widespread development of more complex workshops, small group and/or interactive sessions and other more effective educational measures will require sizable structural, logistical, and financial re-thinking, aided by new business models for CE and possibly by new accreditation requirements.

Problems related to the business aspects of CE also exist as barriers to adopting alternative, outreach interventions. Commercial interests and health professionals themselves have valued traditional, more passive formal CE; funding sources appear to be limited when considering funding for alternative interventions (35). A further impediment to the use of alternative learning interventions is the degree to which these methods are often not considered educational, thus not able to secure credit. In a similar vein, the educational model inherent in these formats is often foreign to the clinician-learner and its source or sponsor (e.g., government) viewed with some skepticism. Finally, while such methods may be more pro-active, when not designed in a way that is sensitive to the needs and practices

of the adult learner, they can suffer from a failure to engage the clinician, or to interact with him/her in a meaningful fashion, thus failing to accomplish their objectives.

The Panel discussed several areas of recommendation regarding classroom educational formats in regards to pre-course planning, course development, assessment, and use of alternative methods. While accrediting bodies have modified requirements to promote a shift to more effective models, the Panel supported the need to accelerate change in the methods used by CE teachers, planners, and providers.

RECOMMENDATIONS

Health care systems, insurers, and state and federal government agencies should embrace and value a more effective system of continuing education, supporting the implementation of a broad range of more effective methods, activities and interventions to ensure relevance to healthcare practitioners and the healthcare system and to improve patient care.

Beyond the usual business and delivery models of CE, efforts should be made to:

- Increase awareness of the need for such support among granting agencies, hospitals and healthcare systems, and other funding bodies;
- Demonstrate the effectiveness of such interventions to possible agencies at federal, regional and state levels, and to private funding agencies;
- Align internal, intra-institutional support towards funding of such methods (e.g., using QI resources to support health system goals); and
- Increase access to and awareness of granting agencies' support for the initiatives on the part of teachers and CE planners

5.1 CE providers, planners, faculty members in academic and other institutions, and health professions organizations should increase their engagement in professional development processes, including teaching strategies and methods, in order to re-shape the delivery of continuing education to address the diverse learning styles and needs of practicing clinicians.

The Panel agreed that this engagement, led by professional CE organizations, academic and health professions organizations, specialty societies, and others would facilitate the improvement of faculty educational skills. For example, training might include the use of case scenarios, modeling problem-solving, teaching to evidence-based content, using principles and strategies to support health professional learning, and employing other methods to influence change in health professionals' behavior (96).

Such a process would also: emphasize the consideration of alternatives to "face to face " methods and the exploration of multiple media methods; allow for creativity, innovation and personalization of CE accessible to clinicians in various settings and integrated into

clinical practice; close participants' performance gaps; and address the needs of both individuals, teams and practice groups. In addition, educational strategies would also include the use of multiple media, interactive techniques, on-line methods, and post-course follow-up to determine the way health professionals learn and change (96). Information and communication technology training would include the use of audio/videoconferencing, the Internet (which provides a single point of access to an array of resources computer-based simulations) and other methods combined with a computer-based instructional program directed to a specific skill or knowledge area (97).

In addition to educating faculty in the use of such techniques, increasing understanding of potential funding sources and modes of integration into local or regional health care systems also is strongly recommended. This process might involve closer collaboration between educators and colleagues in quality improvement, informatics, population health and/or health services research, and among other disciplines.

CE provider development in these areas could assume several forms, from workshops and other programs currently available to formal master's or doctoral level programs. In addition to the CE methods and lifelong learning theoretical training outlined above, such professional development would also include content in the areas of evidence-based healthcare and comparative effectiveness research, the detection and mitigation of commercial bias (98,99), and a broader understanding of ethics, independence, conflict of interest (COI), cost-effectiveness and cost-benefit analysis, as well as other topics.

5.2 CE accrediting bodies should continue, accelerate and strengthen their efforts to support alignment of continuing education methods to be congruent with health system and health professional needs, and the delivery of evidence-based, effective educational methods.

The Panel agreed that this alignment process would support evidence-based approaches to formal continuing education by modifying accreditation standards in collaboration with other bodies (e.g., certification entities, health professional education programs, and others) as appropriate.

5.3 Certifying boards, licensing boards, and other credentialing and healthcare regulatory agencies should work in collaboration to adopt requirements for continuing education that incorporate evidence-based, effective methods and strategies to create a more credible and universal educational vehicle that fosters the public trust.

This collaborative process will require the re-examination of licensing, certification maintenance, and other health professional regulatory requirements, including attention to:

- Re-alignment of accreditation and credit principles. Certifying and professional licensing boards and other credentialing or regulatory agencies should review the evidence about such methods and support their incorporation into regular educational practices by the application of credit or other means. This process could involve the development of pilot credit-granting projects embedded in practice;

- Those factors, e.g., cultural, institutional, state and other requirements that affect learner motivation to actively participate in these alternative and potentially more effective methods of continuing education;

- The use of learning portfolios, especially the degree to which they represent the clinician's documentation of learning and accountability to the public in the absence of CE accreditation;

- The extent and need for overlap in state licensing and specialty certification requirements.

Section 6: Workplace Learning

BACKGROUND

The origins of workplace learning

The business world, in recent years, has experienced a growing interest in workplace learning theory and practice. In response to globalization, privatization, deregulation, and other cultural and economic shifts, employers and workers have recognized the importance of ongoing-learning occurring in the work place. Work-based learning now represents a key to sustainable competitive advantage.

The definition of workplace learning is broad and is strongly affected by how the workplace is conceived. For the purposes of this report a workplace is defined as the physical location, shared meanings, ideas, behaviors, and attitudes that determine the working environment and relationships. In addition, an individual(s) can physically work in another location but see himself or herself as an integral part of the workplace. Finally, workplace learning is defined as "the way in which individuals or groups in a workplace acquire interpret, reorganize, change or assimilate related cluster of information, skills, and feelings" (100).

Learning can occur as part of everyday thinking and acting at work. Workplaces routinely provide opportunities for learning experiences as part of everyday work activities. Workplace learning has emerged as an extension of educational research beyond the confines of schools and other institutions of formal learning. The focus of workplace learning research is commonly pedagogical, focusing on the improvement of conditions and practices of learning and instruction in work settings (101) and examining meaningful participation in learning (102,103). While technology-based workplace learning holds considerable promise, other less technological formats are possible. A wide variety of methods may be used for educational purposes in the workplace, including paper reminder systems, articles attached to patient records , academic detailing, colleague and opinion leader consultation, practice-based conferences such as case reviews, and team-based or practice communities. Technology-based workplace education strategies may be viewed as socio-technical systems. In this regard, they should be easy for providers to use, easily accessible, formatted to answer specific practice-related questions, and facilitating—not interfering—with the provider-patient relationship.

Effective workplace learning, based on current evidence, appears to show potential to prevent errors, support health professional reflection on practice and performance, foster ongoing professional development, and sustain improved individual and organization performance outcomes (104). Learning strategies employed in workplace learning also have the potential to address the rapid increase in biomedical and other health information. Due to this information overload, health professionals can no longer be

educated with the expectation they will be able or should try during each patient encounter to recall information necessary for making decisions that impact the patient's health status. Current approaches to *point-of-care* or *just-in-time* information should be modified and fully integrated into the workplace and work routine across the entire health system. The goal of just-in-time learning is to match educational resources with a clinician's immediate needs. Just-in-time or point-of-care methods allow learning and self-assessment to be embedded into health professionals' daily workflow using links to information and clinical systems; and, therefore, promises to be an effective approach to CE delivery (105,106). In this report, we term such systems *point-of-care* and have described them in greater detail in Section 7.

Effective workplace learning appears to show potential to prevent errors, support health professional reflection on practice and performance, foster ongoing professional development and sustain improved individual and organization performance outcomes

The Health Care Workplace as a Complex Adaptive System

Among the many issues inherent in workplace learning, principles of complex adaptive systems appear important to consider. Existing models in economics and management have been built on the Newtonian principle of the machine. In this model, the whole is the sum of the parts, these parts are controlled by external forces, and the machine's responses are simple and predictable once the external forces are understood. In contrast, the escalating complexity of healthcare and healthcare systems requires a different paradigm for examining and impacting healthcare systems, care delivery and outcomes of care (107).

Health care is a complex adaptive system made up of multiple complex adaptive sub-systems that interact with other such systems. In contemporary health care, the issues of a dynamic work environment and distributed expertise are as prevalent as they are in other work environments. As in other work settings, traditional education in the health sciences has in most cases focused on the development of skills and knowledge necessary to practice in this complex, contemporary healthcare system.

Educators increasingly have attempted to simulate or reflect workplace issues in health professions' curricula. For example, designing simulated workplace scenarios throughout the learning experience, including interprofessional scenarios, have been used with increasing frequency. The Panel, however, recommended a more transformative or disruptive approach. Disruptive innovation, coined by Christensen (108), describes an innovation that unexpectedly displaces an established model, practice or technology. Disruption is a powerful force that can lead to cost-effective, widespread growth and improvement opportunities. Recommending disruption indicates the perception of at least some members of the Panel that a large-scale, transformative change is needed in order to align current educational systems, health professionals' lifelong learning needs and the needs of today's complex health care environment.

Current educational approaches may not fully develop the capabilities needed to deal with the contingent nature of the work and distributed expertise in the work place. Attending

traditional continuing education activities may meet the clinician's perceived learning needs or may provide updated information in specific areas but may not reflect real learning needs related to practice performance. In addition, continuing education providers, in general, may have difficulty providing performance feedback data to learners in a manner that permits its application to practice.

A Vision for Workplace Learning

In response to the growing complexity of the healthcare system and pervasive need for evidence-based knowledge at the point of care, the Panel recommended the establishment of a data-driven, participatory, and patient-centered approach to continuing education embedded in the workplace (109).

The Panel's vision for lifelong learning embedded in the workplace includes formative assessment of performance and continuous learning. Learning while one works can be incidental and informal; however, a greater effect may be gained if the learning is organized and supported by an integrated and coordinated education and workplace information system (110). In such a learning system, performance and outcomes are assessed continuously and supported by the presence of virtual or real workplace coaches, and use of such techniques as cognitive apprenticeship or scaffolding (111). Further, in the course of normal work activities, learning resources, such as reminders and "just-in-time" information, may be provided to clinicians. Integrated into the normal work patterns, and ideally through an electronic health record, "just-in-time" information can provide healthcare professionals immediate answers to questions generated by patient encounters (see Point-of-Care Learning, Section 7). The Panel's vision is described below as a case example of 'workplace learning'.

Workplace Learning: a case example

How would workplace learning function? The following example may illustrate the steps involved in this process.

When performance data demonstrates a clinical practice gap, such as less-then-ideal quality care or identified risks to patient safety, learning strategies would be implemented in the workplace based on the assessed need. First, presenting the health care professional or team information about the difference between current performance and best practice standards leads to recognition of the discrepancy. Second, an impetus to learn and change is fostered by workplace facilitators or coaches who outline what practice changes are needed to reduce or eliminate the discrepancy. Given that learning activities themselves rarely result in immediate improvement, the change in practice may be regarded as a progressive improvement in which continuous assessment and feedback is a necessary motivating factor. This leads to a third step, similar to the Institute for Healthcare Improvement's (IHI) 'micro-system' approach in which a hospital unit or outpatient clinic achieves improvement through participation of the involved team.

In the workplace learning model, this representative team consists of individuals who know about, work in, or have a "stake" in the change. The team, together, examines the data, verifies any gap in care based on best evidence, determines what changes should be

made and develops quantitative measures to assess improvement. This process blends the recognition of the learning need, the actual learning activities and the assessment of learning and practice change. A pilot test of change or learning strategies may be conducted on a small scale, documenting how the change works, including successes, problems, and unexpected occurrences. The team analyzes the data about the change, compares the data to the predicted or hoped for outcomes, and summarizes what was learned. The change is subsequently refined, based on what was learned and may be incorporated into work protocols and practice patterns. This continuous assessment and learning cycle provides progressive improvement until an acceptable level of performance is attained and then ongoing reinforcement to maintain performance (112).

To disseminate practice changes and workplace learning phenomena much more broadly, additional learning activities may follow. For example, a presentation - practice - feedback approach and periodic electronic reminders may provide reinforcement of the initial learning. If the change requires the development of significant new skills, participation in simulated exercises provides opportunities to practice with expert feedback and guidance. The success of this initiative, however, depends on being able to motivate providers or other personnel to use the simulation-based course, whether online or face-face, as part of workplace learning.

RECOMMENDATIONS

6.1 Healthcare systems, leaders, health system accreditation bodies, insurers and others invested in the quality of care should value, fund, and support the construct of workplace learning within current healthcare systems.

This construct would have measurable characteristics including: a clear focus on patient outcomes; extensive use of data in the form of performance measures; a common, shared electronic health record linked to evidence-based content resources; and a team-based, interactive learning culture and processes.

Workplace learning sites would be able to issue as-needed performance and outcome reports. These reports, using evidence-based standards, would be based on multifunctional data and would benchmark individuals' and team performance over time with similar individuals and teams. Using a common information technology platform and the electronic health record (EHR) data domains would include not only disease metrics but also values, behavior, skills, knowledge, and other practice dimensions such as communication patterns and practices. All data should be comparable to external performance data and evidence-based standards and have the potential for use in care gap analyses. Finally, this performance data system, developed by health professional organizations and others, would provide an accessible, interactive, and resource-rich content system, which is simple, selective, and reproducible.

6.2 Credit-granting, licensing and certifying bodies should recognize the importance and value of health professionals' demonstrable participation in workplace learning.

The Panel indicated strongly that the process of implementing workplace learning should be made as seamless as possible. Included in this process is the appropriate demonstration and measurement of performance change and attainment of competence. The functions of healthcare practice and its attendant learning and change should be recognized by a credit (or similar) system that is as unobtrusive as possible. In this discussion, frequent reference was made to the role of the EHR and the degree to which it might serve in providing this measure of performance, change and outcomes. (See also Section 7).

6.3 Continuing education planners, academic health centers, hospitals, health systems, and other healthcare organizations should assist in the design, implementation, and testing of systems which integrate education, learning, and practice within workplace settings.

This process would involve the creation, development, study, and funding of demonstration projects. It could include motivating practices to develop into workplace learning communities. It also would engage the full spectrum of healthcare professionals and practice types relevant to the desired outcomes and would take into account tests of business models to support workplace learning systems, including potential service providers.

6.4 Health system and related research foundations should support pilot studies and more extensive research in workplace learning to develop a fully integrated education and workplace learning system.

Such a process could include: studying and assessing the impact of systems that have instituted rapid improvements and workplace learning models. Such systems include the Department of Veterans' Affairs, Department of Defense, or Kaiser-Permanente healthcare systems and in other high reliability organizations (113). Such systems demonstrate the possibility of cataloguing and testing the utility of currently available data; and defining and modeling appropriate, effective data sets.

Section 7: Point-of-Care Learning

BACKGROUND

Learning at the Point-of-Care vs. Learning in the Classroom

Point-of-Care Learning, a subset of workplace learning, was defined by the Panel as learning that occurs at the time and place (whether virtual or actual) of a health professional/patient encounter.

While classroom continuing-education activities offer ubiquitous and accredited opportunities for health professionals to update their knowledge base, there are clear limitations to the impact of these activities as described earlier. Such formal-education models include outcomes that often fall short of performance change or healthcare improvements; use passive educational methods that have been shown to be less effective; and, include inadequate assessment capabilities.

In contrast, many vehicles exist for a more rapid and pro-active dissemination and implementation of best evidence. Explored in greater detail in Section 5, such interventions include outreach visits; the training and deployment of educational influentials or opinion leaders to lead change at the local level; reminders at the point-of-care; audit of and feedback from electronic medical records; and patient-mediated strategies in which the patient is enlisted as the vehicle to communicate information to clinicians. In general, such alternative educational methods appear to be somewhat more effective than those considered as classroom education in attaining performance change. Further, they possess a push effect– they are able to more actively promote the dissemination and possible implementation of best evidence at the point-of-care. Despite the ability of these activities to reach into the practice setting, most do not occur at the actual point and time of care. This section focuses on a subset of workplace learning, called point-of-care learning.

Characteristics of Point-of-Care Learning

Point-of-care learning is defined in this report as learning that occurs at the time and place of a health professional - patient encounter. Point-of-care learning is most often distinguished by its context, i.e., the active encounter between the clinician and the patient in the healthcare site, home, or elsewhere. It is during this process that information needs are identified and the opportunity for clinician and patient education, clinical decisions, and patient management all intersect. The clinician-patient encounter traditionally has occurred face-to-face in a clinical setting; however, in this age of growing information and

communication technologies and new approaches to healthcare delivery, patient encounters may also include clinician-patient interactions such as telephone calls, email communications, and video conferencing.

Point-of-care learning has several unique characteristics: it provides information based on needs identified during the clinical encounter; it employs evidence-based biomedical and other health-related literature and information resources; and it has the potential to provide an answer either at the time of the patient encounter or soon after. Further, point-of-care learning is seen as an important, and possibly, necessary subset of workplace learning. Point-of-care learning should be a required component of individual and organizational quality improvement processes, linking point-of-care learning resources and activities to performance level data.

Several key elements, similar to those considered as lifelong learning skills operate within the framework of point-of-care learning. The most basic of these skills is knowledge management, including the abilities to identify learning needs, know and understand what resources to use, how to access and critically appraise the information, and how to apply it. A second basic skill is the ability to self-assess, that is, to appropriately assess one's own learning needs, outcomes, and performance change.

INCORPORATING POINT-OF-CARE LEARNING INTO LIFELONG LEARNING AND CONTINUING EDUCATION

Overcoming Barriers

The Panel envisioned multiple strategies to promote point-of-care learning as a mechanism for continuing education. These strategies provide possible means of overcoming barriers to the implementation and use of this learning strategy, namely: the culture and perception of continuing education as a classroom exercise; the previous experience of most faculty members and other teachers of formal education as the primary dissemination vehicle; faculty members' lack of comfort with and abilities to use informatics and other components of point-of-care learning; awarding of CE credit primarily for participation in more formal continuing education activities; and other logistical and technical barriers.

Several strategies, explored by the Panel, may assist in overcoming these barriers include:

- The implementation of faculty development efforts, across the health professional educational continuum, so that point-of-care learning is understood and incorporated into teaching, role modeling, and mentoring activities. Such faculty development will ensure the preparation of teachers to train learners in the use of point-of-care resources.

- The creation of mechanisms to provide easy credit for point-of-care learning activities to facilitate the uptake of these resources by clinicians, and certifying and licensing bodies.

- The active engagement of healthcare system and education accreditation bodies to increase the uptake and support of these processes.

- The use of information and communication technologies in point-of-care learning to facilitate the tracking and recognition of learner activities and credits. In addition, technology provides the potential to take into account the clinician's learning style and needs, document the information resources accessed and utilized, and provide evidence of changes in performance and outcomes of care.

- Integration of point-of-care information resources and learning activities into the electronic health record (EHR) so that providers are presented with context-specific information that is relevant and useful to the clinical decision at hand. Such integration would link the right information to the practitioners, at the right time, and in the place they need it.

Point of Care Learning – a study

In one healthcare system, a "just-in-time" information consultation service was designed to provide a rapid response to clinical questions during patient visiting hours. Questions were submitted by the participants and each question was randomly assigned either to the intervention (librarian information) or control (no librarian information) group.(114) The study concluded that "Providing timely information to clinical questions had a highly positive impact on decision-making and a high approval rating from participants. Using a librarian to respond to clinical questions may allow primary care professionals to have more time in their day, thus potentially increasing patient access to care. Such services may reduce costs through decreasing the need for referrals, further tests, and other courses of action"

Studying and Advancing Point-of-Care Learning

Funding for research on point-of-care learning mechanisms, strategies, and outcomes is needed to support investigative strategies and approaches to evaluate effectiveness of strategies in real life practice settings. In addition, to foster innovative research and development of point-of-care learning, it is essential to incorporate multiple interdisciplinary theoretical frameworks, models, and bodies of knowledge (e.g., health services and education research, clinical epidemiology, informatics, workplace learning theory, and population health). For example the Department of Veterans Affairs Office of Research and Development in attempting to understand the relationship between healthcare professionals' education and outcomes of care, stipulated that proposals establish partnerships between education, health services, and related services.

Innovative, collaborative, and coordinated research is needed in the areas of outcome measurement, conceptual models for point-of-care learning, and point-of-care educational innovations. Updating, maintaining, and communicating information regarding the developing knowledge base and tools for point-of-care learning is also important. In building an agenda for research, it also will be helpful to use the point-of-care experience to identify information gaps and needs that could inform the research agenda of funding

agencies (e.g., Agency for Health Services Research & Quality [AHRQ] and the National Institutes of Health [NIH]). Finally, a better understanding of the impact of point-of-care educational approaches is needed. More specifically, it is important to determine how best to apply these approaches, how to accurately and efficiently identify learning needs, and how to facilitate learner self-assessment.

RECOMMENDATIONS

7.1 Healthcare systems, hospital and health system accreditation bodies and others should support the development and testing of strategies for Point-of Care learning and should incorporate relevant learning technology, resources, and education methods.

This process will require new business models that link learning strategies to patient and population outcomes and consider appropriate re-organization of the clinical-learning environments to accommodate and support point-of-care learning. One such model links performance and quality outcome data to the clinician's performance at the point-of-care. The process will require consideration of the practice culture, context, and structure to most effectively enable point-of-care learning strategies and provide a better understanding of the impact of point-of-care learning on the identification and application of appropriate resources.

7.2 Academic institutions and curricula, continuing education providers, health professional associations and others should incorporate point-of-care learning as an integral component of lifelong learning across the educational continuum.

The Panel recognized that the incorporation of point-of-care learning provides an important and potentially more effective component of clinical education affecting knowledge, behavior, outcomes, and overall patient care. Appropriate point-of-care curricular and practice initiatives can target learners at all stages and can promote the development of competence in knowledge management, principles of communities of practice, and use of information technology. Attainment of this goal, however, will necessitate access to validated point-of-care resources, including EHRs, and clinical information systems for all learners, including health professional students.

Incorporation of point-of-care learning into health professions' continuing education will require role changes for continuing education providers, facilitation of more self-directed learning, and a more active partnership between clinicians and educators in the learning process.

7.3 Health professions organizations, academic institutions, and others should undertake faculty development efforts to better train tutors, role models and teachers in the use of point-of-care learning.

Faculty development in this area would not replace the need for information specialists but would allow for more meaningful and effective collaboration between content experts and continuing education providers. Experts in point-of-care learning would develop methods for collaboration and translation of content; validate point-of-care learning tools; provide support to improve content and tools; assist in the integration of best evidence into educational and point-of-care learning processes; and assist in the development of a research agenda.

7.4 Credit-granting bodies, regulatory bodies, information-technology developers and suppliers should recognize the importance of point-of-care learning by creating user friendly, IT-enabled, and easily accessible mechanisms for the recognition of users of point of care learning .

This work could be enabled by preparatory standard setting by groups such as Medbiquitious [1], and by standardizing credit for point-of-care participation for all healthcare providers. Further, this credit should recognize effective learning strategies and their application in the practice setting.

As the use of information technology becomes more pervasive in healthcare settings, it will be possible to use innovative IT approaches to assess learners' information needs, identify the best resources to address these needs, provide timely and appropriate answers based on evidence-based principles, document learning, and capture the impact of learning on patient management and care outcomes.

7.5 Designers and developers of point-of-care learning resources should continue to develop tools and methodologies for delivering point-of-care information and integrating learner self-assessment and practice performance.

These tools and methodologies will create better resources for point-of-care learning, and afford the testing of point-of-care learning competencies (e.g., in knowledge management and the use of evidence-based resources). Further developments also should lead to smart, practical, user-friendly, integrated information and communication technologies

7.6 Funders and granting agencies, payers, continuing education providers, and healthcare systems should support the need for more innovative, coordinated research in point-of-care learning, with an emphasis on outcome measurement, theory (conceptual models), and innovations.

The Panel envisioned a series of steps in this process. The first step would include a search of all relevant disciplines in this area in order to expand the literature and knowledge base in point-of-care learning. Second, a direct approach should be made to funders, such as AHRQ and RWJ, to support the development of a position paper on point-of-care learning, endorsed by an array of interprofessional organizations. This position statement should include barriers and enablers, and resources for point-of-care learning for all health professions and economic data if available.

Additional research activities would include the evaluation, updating, maintenance, and communication of the point-of-care knowledge base and effective strategies. Finally, it

appears appropriate that the point-of-care experience by healthcare systems, clinicians, and educators be explored to identify information gaps that could inform the research agenda of funding agencies such as, AHRQ's Reports for Effective Health Care Programs and the NIH's new research funding.

Section 8: Summary and Next Steps - Implementing the Consensus

SUMMARY

Those who have been involved in the process of reviewing literature; convening consensus conferences, writing groups, and panels; and developing recommendations – especially in this broad and important area - will acknowledge the enormous effort such a process entails. This initiative presented no exception to that rule.

In general, Expert Panel participants expressed considerable excitement at the possibilities afforded them by the conference and the post-meeting writing opportunities, based on the literature presented in the white papers and their own understanding of the subject matter. This was, one participant said, ”an opportunity to make continuing education better, more collaborative, and more effective”. Another said, “maybe we’ll have better learners at the end of this process.” Most participants would agree with these statements, each viewing it from his or her own perspective – from that of the learner, the healthcare setting, the practicing team, and even – by extrapolation – by the patient.

This section presents a content summary of the major recommendations, identifies the stakeholders involved in taking steps toward implementation, and concludes with a brief summary of tools and strategies considered by the working groups to facilitate the implementation process.

The Content of the Recommendations

Following the review of the white papers, the Expert Panel turned its attention to several key areas, refined by working groups that met post-conference through early 2009. The content of these recommendations is centered on the following four areas:

Continuing education methods

The Panel recognized classroom education (meetings, conferences, rounds, courses, and in-service training) as a tradition among health professionals. Most of these educational activities employ didactic methods, effective at transmitting new knowledge or delivering updates, but with little evidence that these methods produce change in practice. Recommendations encourage the adoption of more effective CE models, including better

needs assessments and educational planning; interactive teaching methodologies; practice enablers such as patient-education materials or flow charts; and innovative educational activities using simulations or practice-based small group activities.

Beyond classroom education, the recommendations turn to a host of broadly defined but under-utilized educational interventions that employ pro-active methods and strategies to effect learning and change in health professionals. These methods include: outreach visits by experts; community-based efforts, (e.g., opinion leaders); point-of care interventions like reminders, protocols, and decision support systems, most often computerized; practice audits and feedback; and multifaceted interventions using formal educational methods in addition to one or more of the others listed above.

Effective and meaningful interprofessional educational programs

The Panel noted a large, descriptive literature about meaningful, effective interprofessional education and its possible merits – from undergraduate to continuing education. In contrast, the usual form of interprofessional education can be best described as multi-professional, a situation in which professionals are participating in parallel activities in the same room but not engaging in interactive educational exercises. In addition, the Panel noted a small but compelling body of literature that urges the development and deployment of interprofessional teams, in primary care, geriatrics, and other specialized areas of health care. While still evolving, these two bodies of literature provide evidence for the need to educate practicing health professionals simultaneously and collaboratively, particularly those who work together, as in team structures.

The development of appropriate lifelong learning skills

The Expert Panel examined the construct of lifelong learning, suggesting that it comprised several key components, including an understanding of evidence-based health care and critical appraisal; familiarity with informatics and literature searching and retrieval strategies; practice-based learning and improvement methods; self-reflection and -assessment; and other skill sets related to knowledge management. While many undergraduate health professional programs have undertaken shifts towards problem-based learning, most basic training adheres to a primarily didactic, lecture-based approach for the entry-level or pre-clinical years, interspersed or followed by rotations through standard clinical settings. The emphasis still remains for the most part on knowledge acquisition and application. Given the high degree of rapid knowledge exchange needed for clinical practice, the increasingly rigorous examination of practicing health professionals' competence and new practice and learning realities, the development of lifelong learning skills may be the most critical element of this conference's recommendations.

Workplace and point-of-care learning

A major emphasis of the Panel - and a breakthrough in its deliberations - was on the construct of workplace learning, a phenomenon taken to encompass continuing education methods, interprofessional and lifelong learning occurring in the workplace. Described as 'disruptive' education or technology, the model unites use of technology, education, and work as mutually dependent, forming a seamless process of using clinical performance data to determine gaps in practice, establishing learning and other strategies to address these needs, and evaluating the outcome.

A subset of workplace education was considered to be point of care learning by which the Panel meant information retrieved at the time and place of the health professional/patient visit or immediately thereafter.

NEXT STEPS

While many of the recommendations are directed to organizational stakeholders such as accreditation bodies, the full implementation of the vision articulated above will require several key elements. First, individual stakeholders will need to understand the literature behind the recommendations and their imperative. In addition, stakeholders require both a sense of collaboration and clarity about the need to implement the recommendations in as timely a fashion as possible; health care reform, learning technologies and patient needs are not able to wait. Second, the effort will require a sizable allocation of resources, time, and energy directed towards the creation of curricula and other resources, as well as for faculty development. Finally, we envision the development of a central, national entity that will provide the infrastructure necessary to accomplish the interprofessional and cross-organizational changes envisioned in this report. We anticipate that Institute of Medicine (IOM) recommendations and other initiatives also will facilitate this process.

The Stakeholders

The implementation of these recommendations will require both intra- and cross-organizational collaboration and recognition of the importance of continuing education in the life, practices, and ongoing learning of health professionals. In a time of significant growth of scientific information and technology, the adoption of these recommendations assumes even more importance in achieving the goal of quality improvement and health care reform.

To that end, the body of the recommendations is directed to key players in three primary areas: education, healthcare delivery, and regulation.

Education

First, recommendations are made to academic institutions, including their faculty members and health science librarians responsible for entry-level and undergraduate education to promote interprofessionalism, collaboration, and the development of lifelong learning skills. The recommendations also include the providers of CE—both administrative leaders and faculty members—encouraging them to adopt more innovative and learner-centered teaching methods. These shifts in faculty preparation, redesign of curricula and development of relevant resources will require buy-in by health professions schools and recognition by accrediting entities of the increasing importance of developing lifelong learning skills in the graduates.

Healthcare Delivery

Second, a cluster of recommendations is made to healthcare institutions and systems, insurers, granting agencies, and others to support these developments.

Regulation

Third, recommendations are made to the accrediting bodies. Health care institutional accrediting entities are encouraged to support workplace and lifelong learning by establishing appropriate and supportive accreditation standards. Accreditors of continuing education offerings are urged to support the inclusion of diverse, evidence-based learning methods into the delivery of continuing education. Finally, educational institution accreditation bodies responsible for health professional and pre-practice learning are encouraged to support the development and assessment of lifelong learning skills and to recognize workplace learning in undergraduate and basic health professional education.

Supporting These Recommendations: Educational Resources and Faculty Development

Those involved in similar consensus processes will recognize that recommendations and reports often languish on the shelves of those who have created them, with little attention to the next steps involved in their implementation. This brief section outlines processes, tools, and strategies for the implementation of this report.

We envision that several elements or strategies may ensure a reasonable uptake of the recommendations. Possibilities include:

- Development of resources and tools (model curricular approaches, best practice examples, further literature reviews) to enable CE providers, educators, and others to adopt new or more effective educational methods;
- Development of an online resource with enhanced web-capacity to support access to these resources;
- Creation of an electronically mediated network to facilitate collaboration among stakeholders engaged in similar or complementary activities;
- Extensive local and national faculty development activities facilitated by information technology; and
- Use of existing meetings and other venues for experts and opinion-leaders in the five identified areas to disseminate findings and share ongoing implementation activities.

A Final Word

Finally, this report concludes with notes of gratitude and optimism. First, we express sincere thanks to those many Expert and External Review Panel members who through their visionary efforts helped to create its recommendations, directions and tone. We recognize the time commitment required and applaud these individuals' vision for lifelong learning and continuing education.

Second, we are optimistic that many if not all these recommendations will be realized. On the one hand, many forces argue against such change – including resource constraints, insufficient faculty numbers, inadequate financial support, and difficulty in bringing about any change. On the other hand, we also recognize the sizable forces inherent in health care reform and pushing for change, the growing number of voices calling for interprofessional education, the increasing explosion of scientific information, calls for greater emphasis on quality improvement and patient safety, and increasing attention to maintaining ongoing competence through re-certification and re-licensure.

One Expert Panel member noted:

> "There is a need to make these changes our own as professionals. If we don't do it, then someone else might and they're not apt to do as good a job. It is better that we envision and realize these changes and recommendations than having such changes imposed [upon us.]"

Dave Davis, MD, CCFP, FCFP, FRCPC(hon)

Joan Stanley, PhD, RN, FAAN

For the Expert Panel

Appendices

A – List of conference participants

Maryann Alexander, Ph.D., RN - National Council of State Boards of Nursing

Alejandro Aparicio, M.D., F.A.C.P. - Continuing Physician Professional Development American Medical Association

Jann Balmer, Ph.D. - University of Virginia Office of Continuing Medical Education

Geraldine Bednash, Ph.D., R.N., F.A.A.N. – American Association of Colleges of Nursing

Kate Bent, Ph.D., R.N. - U.S. Department of Veterans Affairs, Veterans Health Administration

Michael R. Bleich, Ph.D., RN, FAAN - Oregon Health & Science University School of Nursing

Eric G. Campbell, Ph.D. - The Partners Group Institute for Health Policy Massachusetts General Hospital

Carol Clothier - Federation of State Medical Boards of the United States, Inc.

Ellen M Cosgrove, M.D., FACP - University of New Mexico School of Medicine

Malcolm Cox, M.D. - U.S. Department of Veterans Affairs, Veterans Health Administration

Claudette Dalton, MD - Accreditation Council for Continuing Medical Education

Dave Davis, M.D., C.C.F.P., F.C.F.P., F.R.C.P.C(hon)., Association of American Medical Colleges, Washington DC

Diane Doran, Ph.D., M.H.S. - Lawrence Bloomberg Faculty of Nursing, University of Toronto
Mary Anne Dumas, Ph.D., RN, FNP-BC, FAANP- American College of Nurse Practitioners

Jeanne M. Floyd, Ph.D., RN, CAE - The American Nurses Credentialing Center

Michael Fordis, M.D. - Baylor College of Medicine

Robert Galbraith, M.D. - National Board of Medical Examiners

Margaret B. Jackman, M.A. – Commission on Collegiate Nursing Education

Norman B. Kahn, Jr., M.D. - The Council of Medical Specialty Societies

Gabrielle M Kane MB, EdD, FRCPC - University of Washington School of Medicine

Kay Kohl, M.Phil., M.A., Ph.D. - University Continuing Education Association

Maryjoan D. Ladden, Ph.D., RN, FAAN - Robert Wood Johnson Foundation

Karen Mann, BN, MSc, Ph.D. - Dalhousie University

Paul E. Mazmanian, Ph.D. - Virginia Commonwealth University, Richmond,VA

Michele McCorkle, RN, MSN - Oncology Nursing Society

Ann McKibbon, Ph.D. - McMaster University

Justine Medina, RN, M.S. - The American Association of Critical Care Nurses

Donald E. Moore, Ph.D., M.A. - Vanderbilt University School of Medicine

Eduardo Ortiz, M.D., M.P.H. - National Heart, Lung, and Blood Institute at the National Institutes of Health

Dottie Roberts, RN, MSN, MACI, CMSRN, OCNS-C - American board of Nursing Specialties

Mary Jean Schumann, MSN, MBA, RN, CPNP - The American Nurses Association

Madeline (Mattie) H. Schmitt, Ph.D., RN, FAAN, FNAP - Consultant

Rokhsareh Shahidzadeh, M.S.N., R.N. – American Association of Colleges of Nursing

Beth Collins Sharp, Ph.D., R.N - Agency for Healthcare Research and Quality (AHRQ)

Steve Singer, Ph.D. - Accreditation Council for Continuing Medical Education (ACCME)

Mildred Z. Solomon, EdD - Harvard Medical School Division of Medical Ethics

Joan M. Stanley, Ph.D., R.N., C.R.N.P., F.A.A.N. – American Association of Colleges of Nursing

Melinda Steele, M.Ed., CCMEP - Texas Tech University Health Sciences Center School of Medicine

Pamela J. Steinbach, RN, MS - The Joint Commission

Maqueishia D. Tejeda, M.Ed. - Association of American Medical Colleges

Susan W. Wesmiller, RN, MSN - University of Pittsburgh School of Nursing

Carolyn A. Williams, RN, Ph.D., FAAN - Emeritus at the College of Nursing at the University of Kentucky

Patricia S. Yoder-Wise, RN, EdD, NEA-BC, FAAN - The Journal of Continuing Education in Nursing: Continuing Competence for the Future

Brenda Zierler, Ph.D., RN, RVT - University of Washington, Bio behavioral Nursing and Health Systems

Biographical Sketches of Conference Participants

Alejandro Aparicio, M.D., F.A.C.P., is a Board Certified General Internist who also holds a Certificate of Added Qualifications in Geriatrics and is a Certified Medical Director of Long Term Care Facilities. He is a Fellow of the American College of Physicians, a past President of the Illinois Geriatrics Society, the Illinois Medical Directors Association and the Illinois Alliance for CME. For approximately 20 years he practiced medicine on the north side of Chicago and was affiliated with Ravenswood Hospital Medical Center and Advocate Illinois Masonic Medical Center (AIMMC), where he was the Director of Medical Education and Associate Medical Director. He has received the CME Accreditation Service Award from the Illinois State Medical Society (ISMS), the Distinguished Member Award and the President's Award from the Alliance for CME and was appointed to the 2005 White House Conference on Aging Policy Committee and co-chaired its Health Care Subcommittee. His involvement in CME has included, among others, chairing the AIMMC CME committee and the Advocate Health Care system wide CME committee, serving on the Chicago Medical Society CME Committee, as chair of the ISMS Committee on CME Accreditation and continuing to serve as a CME surveyor for the state.

He is a current member of the Steering Committee of the Conjoint Committee on CME and a member of the Rome Group, the EU-North America Committee on CME. In addition, he serves on the University of Illinois at Chicago College of Medicine's (UIC-COM) Chicago campus Committee on

CME and the College wide Committee on CME. Since 2004 he has been the Director of the Division of Continuing Physician Professional Development at the American Medical Association and holds appointments as Clinical Assistant Professor of Medicine and Assistant Professor of Medical Education at UIC-COM

Jann Torrance Balmer, R.N., Ph.D., was appointed as the first full-time Director for Continuing Medical Education of the University Of Virginia School Of Medicine in December 1990. In her role as Director for CME, the Office of Continuing Medical Education has demonstrated significant growth in meeting the educational needs of physicians and other healthcare professionals. Over the past 18 years, the number of accredited CME activities has grown from 25/year in 1991 to 220 activities in FY 2007.

In addition to live conferences and grand rounds, the University of Virginia Office of Continuing Medical Education has developed a robust CME Affiliate Program with over 31 hospitals, health systems and healthcare organizations across the Commonwealth of Virginia. The University of Virginia School of Medicine is actively involved in developing educational activities using information and distance learning technologies. CardioVillage.com and WebSurg.com are two of the leading educational websites sponsored by the University of Virginia Office of CME.

Dr. Balmer was actively involved as a volunteer for the Accreditation Council for Continuing Medical Education from 19932-2005. She served on the Accreditation Review Committee from 1994-2000, serving as vice chair in 1998, and chair in 1999 and 2000. During the year 2000, the ACCME made its first accreditation decisions using the new accreditation system. Dr. Balmer was named the 2003 Willard M. Duff, Ph.D. Award for exemplary and long-term service to the ACCME and also awarded the Robert Raszkowski M.D. Ph.D. ACCME Hero Award in 2007.

Jann Torrance Balmer R.N. Ph.D. serves as the editor for the Best Practices in CME Handbook distributed by the Alliance for CME. She also serves as a member of the Alliance for CME Board of Directors and is the current President Elect for the Alliance. She serves as a speaker at the Annual Meeting of the Alliance for CME and other CME meetings such as the CME Industry Task Force Meeting, the CME Congress and other selected organizations.

Ms. Balmer holds a Bachelor of Science degree in nursing from the University of Pittsburgh, Master of Science in child health nursing from the State University of New York at Buffalo, and a Ph.D. in higher education administration from the University of Pittsburgh.

Prior to accepting her present position, Ms. Balmer served as Nurse Clinician, Division of Pediatric Cardiology, University of Virginia Department of Pediatrics (1985-90); Staff Nurse, Pediatric Unit, University of Virginia Medical Center (1984-85); and Assistant Professor of Nursing Undergraduate Program University of Pittsburgh School of Nursing (1980-83).

Geraldine Bednash, Ph.D., R.N., F.A.A.N., Geraldine "Polly" Bednash, PhD, RN, FAAN, was appointed executive director of the American Association of Colleges of Nursing (AACN) in December 1989. In her role, Dr. Bednash oversees the educational, research, governmental affairs, publications, and other programs of the organization that is the national voice for baccalaureate and graduate-degree education programs in nursing. Representing more than 600 member schools of nursing at public and private institutions nationwide, AACN is the only national organization dedicated exclusively to furthering nursing education in America's universities and four-year colleges.

Dr. Bednash currently serves on the Health Professions Education Council of the Association of Academic Health Centers, is a member of the Sullivan Alliance on Diversity in the Health Professions, and serves on the editorial board of several leading nursing publications, including *Nursing Spectrum*. Her publications and research presentations cover a range of critical issues in nursing education, research, clinical practice, and legislative policy.

Dr. Bednash received her Bachelor of Science degree in nursing from Texas Woman's University, Master of Science in nursing from The Catholic University of America, and doctorate in higher education policy and law from the University of Maryland. She is a fellow of the American Academy of Nursing and member of nursing's national honor society, Sigma Theta Tau International.

Michael Bleich, Ph.D., R.N., F.A.A.N., began working in healthcare in 1970 and has continuously worked in administrative, education and consultative roles to the present. A Wisconsin native, Bleich received a nursing diploma from St. Luke's Hospital School of Nursing, a Bachelor's degree in nursing and liberal arts from Milton College, a master's degree in Public Health (Patient Care Administration) from the University of Minnesota, and a Ph.D. in Human Resource Development from the University of Nebraska – Lincoln. Dr. Bleich is Dean and Distinguished Professor for the School of Nursing at Oregon Health & Science University. He came to Portland, Oregon in August 2008 having come from a distinguished career in Kansas. Dr. Bleich was Professor and Associate Dean for Clinical and Community Affairs at the University Of Kansas School Of Nursing, and also served as the Executive Director/Chief Executive Officer of its faculty practice plan, KU HealthPartners, Inc. In 2006 he was appointed as chair for the Department of Health Policy and Management in the School of Medicine, the first nurse to hold this role in Medicine.

Areas of expertise includes the strategic and operational management of academic clinical enterprises, clinical systems design, work analysis and recognition, incorporating medical home principles in safety net clinics, quality improvement and outcomes metrics, leadership development, and regulatory standards interpretation.

Bleich has published more than 50 articles, book chapters, and monographs on the topics of leadership, academic–service partnerships, and workforce supply and demand in a wide range of peer reviewed and professional venues; two of his book chapters received the AJN Book of the Year Award. In 2002, Dr. Bleich was appointed to the editorial board for the *Journal of Nursing Education* and in 2007 to the board of the *Journal of Nursing Continuing Education*. He is also a reviewer for the *Online Journal of Issues in Nursing (OJIN),* the *Journal of Continuing Education in Nursing, Nursing*

Economic$ and other distinguished journals, in addition to serving as a grant reviewer for HRSA and the Robert Wood Johnson Foundation.

He holds and has held appointments on the JCAHO Nursing Advisory Council and the National advisory Council for the Robert Wood Johnson Executive Nurse Fellows Program and memberships in the American Organization of Nurse Executives, American Nurses' Association, Sigma Theta Tau, the Plexus Institute, and other health services organizations.

Carol Clothier is Vice President of Competency and Strategic Initiatives for the Federation of State Medical Boards. In this capacity, Ms. Clothier is responsible for overseeing the strategic planning and implementation of the Federation's initiatives related to ensuring the continued competence of physicians. She serves as the key point of contact with partner organizations such as the American Board of Medical Specialties, the Accreditation Council for Graduate Medical Education, and the Accreditation Council for Continuing Medical Education.

Ms. Clothier joined the Federation in 1995 as Assistant Vice President, Communications and Education Services. In 1999, she assumed the role of Vice President of Examination and Post-Licensure Services, a position she held until October 2007, when she acquired the FSMB's competency initiatives. Within her leadership role for the organization, Ms. Clothier also contributes to policy development and marketing and communications services for the organization. She has more than 17 years experience in health care management in both for profit and non profit arenas.

Ellen Cosgrove, M.D., F.A.C.P., is the Senior Associate Dean for Education at the University of New Mexico School of Medicine, where she is also Regents' Professor of Internal Medicine. Her major academic interests at present are in exploring performance improvement & continuing medical education, addressing healthcare disparity through curriculum design and integrating public health into the medical curriculum, primary care and community-based education, teaching and assessing medical professionalism, and innovations in problem based learning and medical education technology including simulation. She served a term in residence in 2006 as Visiting Professor at the University of Tokyo's International Research Center for Medical Education. She is Visiting Professor in the Institute for Education Research, Assessment, and Supervision of Southern Medical University in Guangzhou, PR China.

Dr. Cosgrove is a graduate of the University of Pennsylvania, where she majored in Russian History. She obtained her medical degree from Hahnemann Medical College in Philadelphia, where she was elected to Alpha Omega Alpha (AOA), the national medical Honor Society. She did her internship and residency in Internal Medicine at the Presbyterian-University of Pennsylvania Medical Center.

Malcolm Cox, M.D., is the Chief Academic Affiliations Officer for the Veterans Health Administration, U.S. Department of Veterans Affairs, in Washington DC. Dr. Cox received his undergraduate education at the University of the Witwatersrand and his M.D. from Harvard Medical School. After completing postgraduate training in internal medicine and nephrology at the Hospital of the University of Pennsylvania, he rose through the ranks to serve as Associate Chief of Staff for Research

and Chief of the Medical Service at the Philadelphia VA Medical Center; and Vice Chair of the Department of Medicine, Associate Dean for Network & Primary Care Education and Associate Dean for Clinical Education at the University of Pennsylvania School of Medicine, where he was one of the principal architects of the medical school's new undergraduate curriculum.

In 2003, Dr. Cox returned to Harvard Medical School as Dean for Medical Education, where he was instrumental in launching a comprehensive review of undergraduate medical education, joint degree programs with the Harvard Business School and Harvard College, and Harvard's new integrated 3rd-year clinical clerkships. Upon leaving the Dean's Office in January 2005, he was appointed the Carl W. Walter Distinguished Professor of Medicine at Harvard Medical School.

In February 2006, Dr. Cox returned to the Department of Veterans Affairs where he oversees academic affiliations with the Nation's health professions' schools, colleges and universities. Over the past three years, Dr. Cox has led a major expansion of VA's medical, nursing and psychology training programs and an intensive re-evaluation of VA's educational infrastructure and affiliation relationships. At the same time, Dr. Cox has repositioned the Office of Academic Affiliations as a major voice in health professions workforce reform, educational innovation and research, leadership development and organizational transformation.

Dave Davis, M.D., C.C.F.P., F.C.F.P., F.R.C.P.C(hon)., completed his medical training at the University of Toronto in 1969 and entered private family practice in Burlington, Ontario, where he began his life-long interest in continuing medical education (CME). Following his development of an interprofessional continuing education program at Burlington Ontario's Joseph Brant Hospital, he was appointed Director of Continuing Medical Education (1977) and subsequently chair of continuing education (1983) at McMaster University's innovative Faculty of Health Sciences.

Dave has been chair or president of national Canadian organizations (e.g., the Standing Committee on CME of the Association of Faculties of Medicine of Canada) and two North American organizations (the Alliance for CME and the Society for Academic CME). He is currently past-chair of the Guidelines International Network.

Dr Davis is currently the Senior Director, Continuing Education and Performance Improvement for the Association of American Medical Colleges, Washington DC. With colleagues within the association, nationally and internationally, Dave hopes to further progress the practice of effective, evidence-based CME.

Diane Doran, Ph.D., M.H.S., joined the Lawrence Bloomberg Faculty of Nursing, University of Toronto in 1995, where she served as Associate Dean of Research (2000-2006), Interim Dean (2005), and is currently the Lawrence S. Bloomberg Professor in Patient Safety. She is best known for her contributions in the area of evaluation of methods for improving the quality of health care, the measurement of nursing sensitive patient outcomes, and innovations in patient safety. Her research has earned her the Ontario Premier's Research Excellence Award (1999), the Canadian Association of University Schools of Nursing Award of Excellence in Nursing Research (2000), and the Dorothy

Pringle Research Excellence Award, Sigma Theta Tau International, Lambda Pi Chapter (2000), and the Canadian Nurses Centennial Award (2008). She is a fellow of the Canadian Academy of Health Sciences, Deputy Director of the Nursing Health Services Research Unit, University of Toronto, and member of the Research and Evaluation Committee of the Canadian Patient Safety Institute.

Mary Anne Dumas, Ph.D., R.N., F.N.P.-B.C., F.A.A.N.P., is Professor and Chair of the Department of Adult Health Nursing the State University of New York (SUNY) at Stony Brook. In addition, she maintains an active clinical practice as a nurse practitioner (NP) in primary care at the Veterans Administration Medical Center (VAMC), in Northport, New York. She is currently serving a two-year term as president of the National Organization of Nurse Practitioner Faculties (NONPF).

In 2008, Dr. Dumas was appointed by President George W. Bush to the medical ethics sub-committee of the Defense Health Board. She is the first of several nurses ever to be appointed by the President to this position of serving on the Medical Ethics Subcommittee of the Defense Health Board. The Defense Health Board is a Federal Advisory Committee to the Secretary of Defense, providing independent scientific advice/recommendations on matters relating to operational programs, health policy development, health research programs, and requirements for the treatment and prevention of disease and injury, promotion of health and the delivery of health care to Department of Defense beneficiaries.

Dr. Dumas is highly regarded as a leader in nursing education. At the institutional level, she has been instrumental in developing traditional and distance learning nurse practitioner tracks. She has also served as interdisciplinary faculty for the school of medicine's ethics program. She is widely recognized for her work in problem-based learning and consults to other nursing programs. At the national level, she has served multiple terms on the NONPF Board of Directors and led NONPF committees in the development of critical faculty resource material, including preceptor scholarship and grantsmanship manuals.

Jeanne M. Floyd, Ph.D., R.N., C.A.E., With 20 years experience as a not-for-profit nursing association executive, Dr. Jeanne Floyd serves as the Executive Director of the American Nurses Credentialing Center, the largest nurse credentialing organization in the United States with outreach internationally. The 20 year old credentialing center is comprised of seven major programs and a staff of 80. The Certification Program offers 30 examinations and certification renewals for nursing specialists, advanced practice nurses and diabetes educators who are dietitians and pharmacists. Currently, 145,000 individuals are certified through ANCC. The organization also accredits providers and approvers of nursing continuing education.

The Magnet Recognition Program honors health care facilities that consistently recruit and retain the best and brightest health care professionals who team together to provide high quality patient care; 300 hospitals have received the Magnet Recognition award to date.

Provision of credentialing services beyond the U.S. occurs through Credentialing International. Over the last several years, global interest in credentialing has increased with particular interest in the

Magnet Program, accreditation and certification. The Pathway to Excellence Recognition Program was added to the ANCC portfolio in 2007. This quality initiative is primarily aimed at strengthening recruitment and retention of nurses and to raise the bar for provision of care in community health care facilities; small, rural facilities and long-term care facilities.

The program, known as the Institute for Credentialing Innovation, provides educational workshops, review seminars, the annual Magnet Recognition Program, Magnet consultation and certification preparation review manuals. Main purposes of Credentialing Research are to identify areas of needed research, serve as a clearinghouse for credentialing research, promote research partnerships and select the Margretta Madden Styles annual research scholar.

Margaret B. Jackman, M.A., has served for over ten years as the Associate Director of the Commission on Collegiate Nursing Education. She has experience in both institutional and professional accreditation, and experience in university administration in both Registrar and Admissions offices. In her current role, she is responsible for managing the process for accrediting baccalaureate and graduate degree programs in nursing at over 500 institutions throughout the United States and Puerto Rico.

Ms. Jackman currently serves on the Executive Council of Association for General and Liberal Studies. She previously served on the Advisory Committee for the Washington, DC Higher Education Group, and on the Accreditation and Assessment Sub-Committee of the Association of American Colleges and Universities Initiative—Greater Expectations: The Commitment to Quality as a Nation Goes to College.

Ms. Jackman has presented at international conferences regarding accreditation of nursing programs, most recently in Baranquilla, Colombia. She frequently provides orientation to representatives of international nursing programs regarding the accreditation process in the United States.

Gabrielle Kane, M.B., Ed.D., F.R.C.P.C., obtained her medical degree from Trinity College Dublin, Ireland in 1975. She moved to Toronto, Canada in 1983, and was in general practice until deciding to become a radiation oncologist. She completed residency training and a two-year research fellowship at the University of Toronto, during which time she obtained a Master's degree in Education, before joining UT Department of Radiation Oncology faculty at Princess Margaret Hospital as a clinician-educator and then residency program director.

In June 2005, she obtained a Doctoral degree in Education from the University of Toronto. Her thesis examined the impact of change on professional practice, and described a new model of learning and change in a technological multiprofessional practice. Her academic interests include professional education and development, specifically practice-based learning in continuing medical education, interprofessional team learning, and CME research methodologies. She has been involved with the Royal College of Physicians and Surgeon's Maintenance of Certification Program since its inception, and is currently the chair of the program's Standards Committee. She is also an active participant in

the Society of Academic CME; she is past-chair of SACME Endowment Council and the Research Committee, and is the research leader for the Mayo Consensus Conference.

In July 2007 she left Toronto, and her position as UT DRO postgraduate education director, and moved to Seattle for a new adventure in the Pacific North-West. She is an Associate Professor at the University of Washington with joint appointments to the Department of Radiation Oncology and the Department of Medical Education and Biomedical Informatics.

Norman Kahn, Jr., M.D., serves as Executive Vice-president and Chief Executive Officer of the Council of Medical Specialty Societies (CMSS). CMSS represents 32 medical specialty societies with an aggregate membership of over 500,000 physicians. He is Board Certified in Family Medicine and Geriatrics.

Dr. Kahn has served on the Accreditation Council for Continuing Medical Education, where he chaired the Task Force that revised the Standards for Commercial Support of CME. Dr. Kahn serves on the National Steering Committee, and Co-chairs the National Advisory Committee of the Improving Performance in Practice (IPIP) project, funded by the Robert Wood Johnson Foundation to the American Board of Medical Specialties (ABMS). He also represents CMSS to the Physicians Consortium for Performance Improvement (PCPI).

Maryjoan D. Ladden, Ph.D., R.N., F.A.A.N., is a Senior Program Officer at the Robert Wood Johnson Foundation working on the Human Capital Team. Prior to joining the Foundation, she served as interim Chief Programs Officer of the American Nurses Association (ANA), providing strategic direction, integration and coordination for ANA programs. Dr. Ladden is a nurse practitioner and Assistant Professor of Ambulatory Care and Prevention at Harvard Medical School.

Her work, and Robert Wood Johnson Foundation Executive Nurse Fellowship 2004-2007, focused on improving health care quality, safety and health professional collaboration. Dr. Ladden received her B.S. in Nursing from the University of Connecticut, M.S. as a nurse practitioner from the University of Rochester, and her Ph.D., with Distinction, from Boston College School of Nursing.

Karen V. Mann, B.N., M.Sc., Ph.D., joined Dalhousie University Faculty of Medicine in 1986, and served as Associate Dean for Undergraduate Medical Education and Student Affairs from 1990-1998(2001, 2008). She is currently appointed as Professor in the Division of Medical Education, where she was founding Director (1995-2006). Dr. Mann is also a professor in Dalhousie's School of Nursing, and holds a Part time appointment as Chair in medical education at Manchester Medical School at the University of Manchester, UK. Karen is involved in teaching, research and development in medical education across the continuum of medical education. Recent involvements have included the development of an elective in medical education for residents in Royal College and College of Family Physicians of Canada programs, and, in partnership with Mount Saint Vincent University, a Master's program in Medical Education for residents, faculty and staff in medicine, dentistry and the health professions. As well, she served as Principal investigator on a 3 year Health Canada research project. in interprofessional education.

Her current research interest is in self-assessment. She serves on the editorial boards of *Academic Medicine, Medical Education* and the *Journal of Continuing Education in the Health Professions*. Formerly Chair of the Research in Medical Education Section, and Chair of the Group on Educational Affairs of the AAMC, she now serves as Past Chair. Karen served as President of the Canadian Association for Medical Education; she received CAME award for Distinguished Contributions to Medical Education in 1996, a Dalhousie Instructional Leadership award in 2000, and the 2005 Award for Contributions to Medical Education Research from the Society of Academic CME. In 2007, she was awarded Honorary membership in the College of Family Physicians of Canada.

Karen has lived in Nova Scotia for most of her life. Ian Mobbs, her husband, has recently retired. Three children and their families and six grandchildren, along with as much music as possible are favourite pastimes.

Ann Mckibbon, M.L.S., Ph.D., is a health informatician with background in information sciences and health librarianship. She is also interested in knowledge translation (moving evidence into practice) and how information technology can be harnessed to enable and speed this process in clinical and home settings. She started work in the early 1980s on a project to collect and evaluate high-quality studies of continuing health professional continuing education. This project was under the supervision of Dr. Dave Davis and is still ongoing as the Research and Development Resource Base (http://128.100.115.20/).

Ann has supervised and developed information tools to keep physicians and nurses alerted to important new publications in specific disciplines. Examples are Evidence Updates+ for physicians (http://plus.mcmaster.ca/EvidenceUpdates/), Nursing+: Best Evidence for Nursing Care (http://plus.mcmaster.ca/np/AboutThisSite.aspx). and the Clinical Queries in PubMed (http://www.ncbi.nlm.nih.gov/entrez/query/static/clinical.shtml). (All of these sites are freely available.)

After completing her Ph.D. in medical informatics at the University of Pittsburgh in 2005 she returned to McMaster University. She is an Associate Professor in the Department of Clinical Epidemiology and Biostatics in the Faculty of Health Sciences. Ann is the director of an interdisciplinary eHealth program which enrolled its first M.Sc. students in 2008. Her research interests include knowledge translation, information retrieval to enhance clinical care, systematic reviews, and the use of information technology by clinicians, patients, and informal caregivers. Her teaching expertise centers on research methods, informatics, and evidence based care. The main audiences are graduate students, practicing clinicians, and librarians both in and outside McMaster. She has written 4 books, more than 60 peer-reviewed articles, and multiple book chapters and technical reports.

Michele McCorkle, R.N., M.S.N., is the Executive Director of Corporate Support, Partnerships, and Education at the Oncology Nursing Society (ONS). With more than 20 years oncology nursing experience and 13 years in association management, Michele works with the CEO to coordinate corporate business development efforts, build effective partnerships, and strategize funding

opportunities for ONS. Michele's responsibilities also include the ONS Education Team, which houses administrative oversight of the ONS continuing nursing education Provider and Approver Units; and plans and implements the Society's four national conferences and a variety of educational programs based on demonstrated need. She has led a number of strategic efforts at ONS, including the development and leadership of Oncology Education Services, Inc., ONS' for-profit subsidiary from inception in 1996 until 2005.

Prior to joining the ONS staff, Michele was Patient Care Manager, Staff Development Instructor, and Clinical Nurse at the University of Pittsburgh Cancer Institute. She received both her B.S.N. and M.S.N. from the University of Pittsburgh School of Nursing. Michele can be reached at 412-859-6266 or mmccorkle@ons.org.

Justine Medina, R.N., M.S., is Director of Professional Practice and Programs at the American Association of Critical Care Nurses. Ms. Medina is the leader for development of key resources for practice, education, research, and public policy for the association. In her role she ensures a comprehensive, cohesive and integrated organizational strategy for the provision of practice, education and research resources, e-learning programs, symposiums and other educational initiatives. Her leadership has lead to the development and success of the e-learning initiatives. These programs represent the gold standard in orientation, management and use of simulation as learning tools. In addition, she has central responsibility for assuring that initiatives specifically targeting achievement of AACN's mission, vision and priorities are not only comprehensive in scope, but effectively integrated throughout the association. Her work in collaboration with physician and other healthcare professional groups has brought the critical care nursing voice in areas such as mass casualty preparation and pain management. She is a published author of educational resources which for example focus on end-of-life care, clinical decision making and staffing, e-learning, continuing education and competency assessment, pain management and healthy work environments. She has been an association leader for over 11 years representing the needs of 500,000 acute and critical nursing professionals.

Donald E. Moore, Jr., , Ph.D., is currently Director, Division of Continuing Medical Education, Director of Evaluation and Education, Office of Graduate Medical Education, and Professor of Medical Education and Administration at Vanderbilt University School of Medicine, at Vanderbilt University School of Medicine in Nashville, Tennessee. He is a Faculty Associate in the Office of Teaching and Learning in Medicine. He also serves as Head of the Medical Education Area of the Emphasis program, an innovative research program for first and second year medical students.

Over the past thirty-five years, Dr. Moore has served in a variety of positions in medical school, hospital, hospital consortia, and government health care settings. In these positions, he has been involved in the development and coordination of continuing medical education for physicians as well as continuing education for hospital staff, faculty development, the management of a sophisticated educational technology center, and the establishment of a diabetes healthcare, education, and research program.

Dr. Moore received his Ph.D. in education from the University of Illinois at Urbana-Champaign in 1982. He has published over 35 articles and book chapters and has made just over 125 presentations at a variety of professional meetings. He was President of the Alliance for CME in 2002 and 2003, has been an ACCME surveyor for more than 20 years, and serves as a consulting editor for the Journal of Continuing Education in the Health Professions. His current scholarly interests are planning educational activities to achieve desired outcomes, linking quality improvement and CME and practice-based learning and improvement.

Eduardo Ortiz, M.D., M.P.H., is a Board-Certified Internist with expertise in evidence-based medicine, clinical informatics, and health services research. Dr. Ortiz is currently Senior Medical Officer in the Division for the Application of Research Discoveries and Senior Advisor in the Center for Biomedical Informatics at the National Heart, Lung, and Blood Institute at the National Institutes of Health. His current work is focused on translating and disseminating research into clinical practice through the development and implementation of clinical guidelines and other knowledge management tools and initiatives. Previously Dr. Ortiz was Associate Chief of Staff, Director of Clinical Informatics, and a faculty physician on the inpatient and outpatient medical services at the Washington DC Veterans Affairs Medical Center. He also served as Senior Advisor for Clinical Informatics at the Agency for Healthcare Research and Quality. Dr. Ortiz has held academic faculty appointments at Harvard Medical School, Johns Hopkins School of Medicine, George Washington University School of Medicine, and the University of California San Diego School of Medicine. His primary areas of interests are in the application of evidence-based principles in health care and use of clinical informatics to improve patient safety and quality of care.

Dottie Roberts, M.S.N., M.A.C.I., R.N., C.M.S.R.N., O.C.N.S.-C.®, is a certified orthopaedic clinical nurse specialist and medical-surgical nurse employed by Palmetto Health Baptist, Columbia, SC. She also serves as editor of *MEDSURG Nursing: The Journal of Adult Health,* official journal of the Academy of Medical-Surgical Nurses. Dottie has been affiliated with the Orthopaedic Nurses Certification Board since 1998, and has held the position of Executive Director since 2004. She has represented ONCB to the American Board of Nursing Specialties since 2000, and accepted the position of member-at-large on the ABNS board in 2002. She is serving currently as ABNS president.

Madeline (Mattie) H. Schmitt, Ph.D., R.N., F.A.A.N., F.N.A.P., Professor Emerita, is a nurse-sociologist. Prior to her retirement she was Professor and Independence Foundation Chair in Nursing and Interprofessional Education at The University of Rochester, School of Nursing. She is a consultant and sought after speaker in the USA and abroad on interprofessional practice and education (IPE). For 35 years she has conducted measurement and outcomes studies of interprofessional practice models in health care and participated in national IPE initiatives. She is sole or co-author of more than 100 professional publications, many of them focused on IPE and collaborative practice models.

She was a co-chair of the 2006 London-based IPE conference, *All Together, Better Health III* and major consultant to the 2007 American-Canadian IPE conference, *Collaborating Across Borders*. As an associate editor of the *Journal of Interprofessional Care,* she was responsible for two 2007 *Journal* supplements. One focused on the seminal contributions of DeWitt C. Baldwin, Jr. M.D., an early

leader and continuing advocate for IPE. The second, co-edited with James M. Galloway, M.D., focused on *Pathways Into Health*, a broad coalition of the Indian Health Service, universities, Tribes and Tribal organizations to increase the numbers of American Indian/Alaska Native health care workers and professionals using interprofessional, culturally attuned and distance education strategies. She is an inaugural member of the Board of The International Association for Interprofessional Education and Collaborative Practice (InterEd) and a member of the W.H.O. Study Group on Interprofessional Education and Collaborative Practice. She is the recipient of numerous distinguished teaching awards. She has been a Fellow of the American Academy of Nursing since 1977 and was inducted into the National Academies of Practice in 2000, which honored her with their Award for Interdisciplinary Creativity.

Mary Jean Schumann, M.S.N., M.B.A., R.N., C.P.N.P., is Chief Programs Officer at the American Nurses Association (ANA). Ms. Schumann is responsible for directing all of ANA's programmatic and content areas including nursing practice and policy, government relations, ethics and human rights, occupational and environmental health and the association's continuing education programs. As a member of the senior executive leadership team, some of her priorities include advocating for safe, quality health care for the public through support of the nursing profession, and advancement of the registered nurse as a key provider in the nation's health care delivery system.

Prior to joining ANA, Ms. Schumann served as Executive Director of the National Organization on Adolescent Pregnancy, Parenting, and Prevention, Executive Director of the National Certification Board of Pediatric Nurse Practitioners, as well as Chief Nursing Officer at Tomah Memorial Hospital in Tomah, Wisconsin. Ms. Schumann is a certified pediatric nurse practitioner. Ms. Schumann is currently pursing her Doctorate of Nursing Practice (DNP) at Johns Hopkins University.

Rokhsareh Shahidzadeh, M.S.N., R.N., is a continuing Education Program Manager at the American Association of Colleges of Nurses. Prior to this role, she has held various positions in nursing practice and education as well as healthcare consultation. In these roles, she led multiple programs for creating, delivering, and evaluating innovative continuing education programs such as online education, nursing orientation and the nursing skills competency programs.

Her practice and research interests include global health, population care management programs with an emphasis on health promotion and disease prevention, healthcare outcomes management, and interprofessional practice and education.

Steve Singer, Ph.D., is the Director of Education, Monitoring, and Improvement at the Accreditation Council for Continuing Medical Education (ACCME), where he oversees educational development and outreach in support of the CME system. Prior to the ACCME, Dr. Singer held a senior management position at an ACCME-accredited provider where he directed the development of nationally-focused educational initiatives for the healthcare team.

Dr. Singer has served in leadership roles of a number of CME professional organizations and has been a frequent author and presenter for national publications and conferences. Dr. Singer's diverse experience in education includes contributions in medicine, biotechnology, government, and middle

school science curricula. Dr. Singer received his doctorate in neuropharmacology from the Stritch School of Medicine.

Mildred Solomon, Ed.D., is Vice President of Education Development Center, Inc. (EDC), an international non-profit research and development organization of more than 1200 professional staff, and Associate Clinical Professor of Social Medicine, Medical Ethics, and Anaesthesia at Harvard Medical School. At EDC, Dr. Solomon directs its Center for Applied Ethics, an interdisciplinary group of social scientists engaged in a variety of studies focusing on values questions in medicine and health care and on health system quality improvement. At Harvard, she directs the medical school's Fellowship in Medical Ethics, a program aimed at building the bioethics capacity of the Harvard-affiliated teaching hospitals. Fellows are physicians, nurses, social workers, and other professionals such as journalists and lawyers, interested in developing their skills in bioethics.

An expert in ethics education and behavioral change, Dr. Solomon has more than 30 years' experience researching, designing, and evaluating a wide variety of education and quality improvement programs for health professionals, health care organizations, and the public, particularly in areas of medical uncertainty, where values questions pose difficult policy and practice challenges. She has served as principal investigator on numerous grants from federal agencies, including the National Institutes of Health, the Agency for Health Research and Quality, the Centers for Disease Control and Prevention, and the Health Resources and Services Administration. She frequently consults to government agencies, foundations, universities, and national organizations. Currently, for the National Institutes of Health, she is leading an effort to educate U.S. high school students about the ethical issues raised by advances in the life sciences, and advising the National Academies of Science on ways to promote a culture of responsibility to enhance biosecurity in the laboratories of life scientists and chemists worldwide.

An elected Fellow of The Hastings Center, one of the nation's pre-eminent bioethics policy institutes, Dr. Solomon's bioethics scholarship has focused most on the ethics of adult and pediatric end-of-life care and on the ethics of organ donation. Examples of her policy contributions include consultations to two committees of the Institute of Medicine in the areas of palliative care and organ donation. She also sits on the U.S. Secretary of Health and Human Services' Advisory Committee on Organ Transplantation, which makes national policy recommendations to the Secretary for enhancing organ donation and transplantation. In the mid-1990s, Dr. Solomon was honored by the Association of Academic Health Centers for a "distinguished career in educational research." She received her BA degree from Smith College, and her doctorate from Harvard University.

Joan M. Stanley, Ph.D., R.N., C.R.N.P., F.A.A.N., is Senior Director of Education Policy at the American Association of Colleges of Nursing (AACN), in Washington, DC. Dr. Stanley serves as a member of numerous AACN Task Forces & Committees, including the Clinical Nurse Leader Steering Committee and the newly formed Task Force on the Essentials for Master's Education and the Task Force on the Future Research Focused Doctorate. She has served as staff liaison to the CNL initiative since its inception with TFER II in 2002; and, served as staff liaison to the Task Forces on the Practice Doctorate and the Essentials for the Doctor of Nursing Practice. She also has and does serve as

AACN's representative to many advanced practice nursing projects, including the APRN Consensus Process which has developed a model for APRN licensure, certification, education and accreditation. In her position, she also provides leadership for three major initiatives in gerontology nursing education funded by The John A. Hartford Foundation.

Dr. Stanley held a faculty position,1977-1982, in the Adult Primary Care Nurse Practitioner Program at the University of Maryland. Since 1973, Dr. Stanley has practiced as an adult nurse practitioner at the University of Maryland Medical System. And her text, Advanced Practice Nursing: Emphasizing Common Roles, second edition, won the 2005 AJN APN Book of the Year Award.

Melinda Steele, M.Ed., C.C.M.E.P., is Director of Continuing Medical Education at Texas Tech University Health Sciences Center School of Medicine in Lubbock, Texas. She has responsibility for the Office of Continuing Medical Education functions on the 3 School of Medicine campuses in Lubbock, Amarillo, and Odessa, as well as the new Texas Tech medical school in El Paso. She received her Masters of Education in Instructional Technology and Design from Texas Tech University, her Bachelor of Science in Education from Hardin-Simmons University and her Associate Arts in Communications from Weatherford College. Melinda has been active in CME since 1992. She is a member of the Alliance for CME, as well as the Society for Academic CME. In SACME she serves on the Membership Committee, Communications Committee, Finance Committee, Research Committee, Research Endowment Council, was Chair of the Program Committee from November 2002 – November 2004, and was the Editor of the INTERCOM from 2004 - 2006. She also served on the Terrorism CE Task Force for SACME.

In April 2006 she was elected to the leadership track and serves as President of SACME. In the Alliance for CME she has held numerous committee positions and has served a three year term as the Medical School Provider Section Leader. She has been a proactive voice for academic CME providers with industry, striving to achieve workable solutions for both in regard to LOA's, on line grant submissions and other processes related to commercial support of independent continuing medical education. She was appointed to the AMA Task Force on CME Provider/Industry Collaborations in December 2006 and was appointed Co-Chair of the Program Committee for 2008 – 2009, as well as a sub committee on the Harmonization of Processes Associated Commercial Support. She also served on the AMA Initiative to Transform Medical Education Task Force. In 2008 she was part of the core planning team for the Mayo CME Consensus Conference on Research and Strategic Management, a seminal event in shaping the future of CME. Also in 2008 she was appointed to the NC-CME Job Analysis and Exam Writing Team for the Certification of CME Professionals. She is a Certified CME Professional.

In her previous positions at Texas Tech she has served as the founder and coordinator of the Academic Computer Training program and Manager of the XL Program, a mandatory re-entry program for students returning from scholastic suspension for the academic campus. She has also taught in the public schools in various capacities including third grade and Speech Communications and Debate Coach. Sheryl Swoopes was one of her former students when she taught third grade in Brownfield, Texas.

Melinda has been married to Don Steele, her high school sweetheart, for 32 years. They have two sons, James, 27 (married to Mindy Steele) and Jeff, 25, two black labs, Jake and Bubba, and at last count, 26 Desert Box Turtles (names provided upon request).

MaQueishia D. Tejeda, B.S., M.Ed., has been working in the healthcare industry since 1999. Currently, Mrs. Tejeda is a Project Manager with the Association of American Medical Colleges (AAMC), where she is responsible for providing vital support to a project on evaluation of CE in nursing and medicine. She received a Bachelors of Science in International Business with a specialization in Economics, and a Masters of Education with a specialization in Technology based curriculum. Mrs. Tejeda has over 13 years experience in technological based programs with an emphasis on education.

Susan Watters Wesmiller, R.N., M.S.N., until recently was the Director of Nursing Education and Research at the University of Pittsburgh Medical Center, a position that she held for 15 years. She left that position to complete her doctoral dissertation and is currently a full time student and teaching fellow at the University of Pittsburgh School Of Nursing.

Ms. Wesmiller received her B.S.N. and her M.S.N. from the University of Pittsburgh, School of Nursing. She is a Pulmonary Clinical Nurse Specialist who has served in multiple advanced practice roles including the Project Director for two NIH funded research studies focused on oxygen delivery methods. She is an active member of the National Nursing Staff Development Organization. She is a member of the Commonwealth of Pennsylvania Workforce Investment Board Clinical Task Force, and in that capacity has worked closely with the development of loaned faculty initiatives between service and academic settings. She has published in journals and co-authored several book chapters. She is currently a reviewer for the *Journal of Continuing Education in Nursing.*

Carolyn A. Williams, R.N., Ph.D., F.A.A.N., is Professor and Dean Emeritus at the College of Nursing at the University of Kentucky, Lexington, Kentucky. In 1984 she was appointed Dean of the College and served in that role to August of 2006. Prior to her appointment at the University of Kentucky, she held several academic positions, including Associate Professor of Epidemiology in the School of Public Health and Associate Professor Nursing in the School of Nursing at the University of North Carolina in Chapel Hill and Professor and Director of Graduate Program and Research at the Nell Hodgson Woodruff School of Nursing, Emory University. She has many publications in nursing, primary care, and public health, and she has served on numerous editorial boards and as a reviewer for several publications. In 2001 she led the faculty at the UK College of Nursing in developing the first DNP (Doctorate of Nursing Practice) Program in the Country.

Dr. Williams has held many leadership roles including President of the American Association of Colleges of Nursing and President of the American Academy of Nursing; Chairperson, ANA's Commission on Nursing Research; Member, Program Development Board, American Public Health Association (APHA); and, member, Boards of the American Association of Colleges of Nursing, and Appalachian Regional Healthcare, Inc. She has held appointments on National Research Study sections and on review panels for the National Institute for Nursing Research. National policy-making roles include appointment by President Carter as a nurse member of the President's

Commission for the Study of Ethical Problems in Medicine, Biomedical and Behavioral Research and membership on the first US Preventive Services Task Force, U.S., DHHS.

Dr. Williams has provided international consultation to South America through the Pan American Health Organization (WHO), to the WHO in Geneva, and as a member of WHO's Nursing Advisory Panel. In 2002 she served as a consultant in nursing education to the Ministry of Education in the United Arab Emirates. She is a Fellow of the American Public Health Association (APHA) and the American Academy of Nursing (AAN). During 2007 – 2008 she held the appointment as the Distinguished Nurse Scholar-in-Residence at the Institute of Medicine of the National Academies in Washington, DC.

Patricia S. Yoder-Wise, R.N., Ed.D., N.E.A.-B.C., F.A.A.N., is Editor-in-Chief of *The Journal of Continuing Education in Nursing: Continuing Competence for the Future.* She is a professor of nursing at Texas Tech University Health Sciences Center (Lubbock), where she teaches in the graduate nursing administration program and the leadership program in the DNP program. In addition, she teaches policy and politics in the Ph.D. program at Texas Woman's University-Houston. Pat is a member of the Texas Nurses Association's Competency Task Force and a member of the Texas Competency Consortium. The TNA Task Force is addressing both a model and a system for addressing continuing competence of nurses in Texas. The Consortium was created as a central place for addressing competency issues ranging from those related to students through experienced practitioners. She is the author/editor of *Leading and Managing in Nursing* (undergraduate) and *Beyond Leading and Managing: Nursing Administration for the Future* (graduate). She writes extensively about nursing management and leadership and will serve as guest editor for both *Nursing Administration Quarterly* and *Nurse Leader*.

As President of the American Nurses Credentialing Center (2005-2007), she led and participated in numerous discussions about individual competence (certification) and organizational competence and excellence (Magnet and continuing education accreditation). She is board certified through the American Nurses Credentialing Center as a nurse executive, advanced and in gerontological nursing. Pat has served as a nurse representative on working groups of the Joint Commission and the National Quality Forum. She is a fellow of the Nursing Education Academy and the American Academy of Nursing. She is a past president of the Texas Nurses Association. Additionally, she has held various national offices, including her current office of Treasurer of the American Academy of Nursing.

Brenda K. Zierler, Ph.D., R.N., R.V.T., Associate Dean of Technology Innovations in Education and Research for the University of Washington School of Nursing, Seattle, WA and Associate Professor in Biobehavioral Nursing and Health Systems; Adjunct Associate Professor Department of Surgery, Vascular Division, School of Medicine; Adjunct Associate Professor Department of Health Services, School of Public Health; and Adjunct Associate Professor Department of Medical Education and Biomedical Informatics. In her role, Dr. Zierler leads the School of Nursing in facilitating and articulating the School's agenda for innovative educational programs. She is responsible for managing the infrastructure for creating, delivering, and evaluating Web-based courses and distance-based course technologies. She oversees the skills and simulation laboratory called the Center for Excellence in Nursing Education.

Dr. Zierler developed the Clinical Informatics and Patient Centered Technologies masters program at the UW School of Nursing and now leads a HRSA- training grant focusing on faculty development in the use of technology. Dr. Zierler's research explores the relationships between the delivery of health care and outcomes—at both the patient and system level. In collaboration with other scholars and clinicians in the Schools of Medicine, Nursing, and Pharmacy, she created an interdisciplinary work group that developed appropriate and specific health outcome measures to evaluate the effectiveness of a coordinated approach in care delivery for the diagnosis and treatment of venous thromboembolism (VTE).

Her latest research supported by the Agency for Healthcare Research and Quality (Patient Safety Grant) focuses on the implementation and evaluation of a system-supported VTE Safety Toolkit. The Toolkit has been disseminated nationally for the purpose of improving the quality and safety of care. Dr. Zierler is Co-PI of an interprofessional grant funded by the Macy Foundation to create an innovative high-tech simulation training program focused on interprofessional communication, leadership, mutual respect and collaboration for nursing, medical and pharmacy students. Dr. Zierler currently serves on the Editorial Board for *Policy, Politics and Nursing Practice.*

AAMC Personnel

Hameed Ahmed, MS – Educational Data Analyst

Kirsten Olean, CMP – Director of Meetings

Ram Ray, MA – Grant Writer

Michael Saleh – MedEdPORTAL Project Specialist

Oswald Umuhoza, MPH – Program Specialist

AACN/ AAMC Conference Planning Committee

Dave Davis, M.D., FCFP – Senior Director, Continuing Education and Performance Improvement Association of American Medical Colleges (Project Director)

Joan Stanley, Ph.D., RN, CRNP, FAAN – Senior Director of Education Policy, American Association of Colleges of Nursing (AACN) (Project Director)

Rokhsareh Shahidzadeh, MSN, RN – Continuing Education Program Manager, American Association of Colleges of Nursing (Program Manager)

Maqueishia D. Tejeda, M.Ed. – Association of American Medical Colleges (Research Analyst)

Note - Conflict of interest Statements

Conflict of interest statements were gathered from all conference participants. They included the identification of possible sources of bias, and employers of individuals. These collected documents are available at both the AAMC and AACN offices.

Members of the Working/Writing Groups

Lifelong Learning

- Micheal Bleich
- Karen Mann
- Carolyn Williams
- Ellen Cosgrove
- Susan Wesmiller

Interprofessional Education

- Jann Balmer
- Brenda Zierler
- Madeline Schmitt
- Pam Steinbach
- Mary Ann Dumas
- Justin Medina

Continuing Education Methods

- Melinda Steele
- Claudette Dalton
- Norm Kahn
- Jeanne Floyd
- Dottie Roberts
- Pat Yoder-Wise
- Mary Joan Ladden
- Steve Singer
- Michele McCorKle

Workplace/Practice Learning

- Malcolm Cox
- Ellen Cosgrove
- Mildred Solomon
- Don Moore
- Kate Bent
- Robert Galbraith

Point Of Care

- Mildred Solomon
- Eduardo Ortiz
- Ann McKibbon
- Michael Fordis
- Diane Doran
- Gabrielle Kane
- Al Aparicio

- We are especially grateful to those individuals who contributed extensively to the product of the writing groups. These include: Don Moore, Ann McKibbon, Michael Fordis, Diane Doran, Mattie Schmidt, Karen Mann, Jann Balmer, Ellen Cosgrove, Micheal Bleich, Carolyn Williams, Norm Kahn, Melinda Steele, Patty Yoder-Wise, Brenda Zierler and many others.

B – External review panel members (invited)

Cynthia Flynn Capers, PhD, RN, Professor of The University of Akron College of Nursing; Board Member of Commission on Collegiate Nursing Education

Nancy L. Davis, PhD – Executive Director, National Institute for Quality Improvement and Education

Seth A. Eisen, MD, MSc – U.S. Department of Veterans Affairs, Health Services Research and Development Service

Richard Hawkins, MD, FACP - The American Board of Medical Specialties

Eric S. Holmboe, MD – American Board of Internal Medicine

Sheldon D. Horowitz, MD – The American Board of Medical Specialties

Murray Kopelow, MD, MS (Comm), FRCPC – Accreditation Council for Continuing Medical Education

Patsy Maloney, EdD, RN-BC, NEA-BC, Professor and Director, Continuing Nursing Education, Pacific Lutheran University School of Nursing

Pamela Mitchell, PhD, RN, FAHA, FAAN Director, Center for Health Sciences Interprofessional Education, University of Washington

Scott Reeves, PhD, MSc, BSc, Director of Research, Centre for Faculty Development at St Michael's Hospital, Toronto, Ontario

E. Michele Richardson, MS, BSN, RN, Director, Division of Nursing, US Department of Health and Human Services

Catherine Rick, MS, RN, NEA-BC, FACHE, Chief Nursing Officer, Department of Veterans Affairs

Paul M. Schyve, MD – The Joint Commission

Jean R. Slutsky, PA, MSPH – Agency for Healthcare Research and Quality (AHRQ)

Julia Sollenberger, MLS, AHIP, FMLA, President, Association of Academic Health Sciences Libraries and Associate VP, Medical Center Libraries and Technologies, University of Rochester Medical Center

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C – Allied health professions' panel members

- **David S. O'Bryon, JD,** CAE, Executive Director Association of Chiropractic Colleges

- **Lucinda L. Maine, PhD,** Executive Vice President, American Association of Colleges of Pharmacy

- **Lydia Middleton, MBA**, CAE, President & CEO,Assoc of University Programs in Health Admin

- **Richard Valachovic, DMD, MPH**, Executive Director, American Dental Education Association

- **Carol Aschenbrener, MD,** Executive Vice President, Association of American Medical Colleges

- **Polly Bednash, RN, PhD,** Executive Director, American Association of Colleges of Nursing

- **Timi Agar Barwick,** Executive Director, Association of Physician Assistant Programs

- **Thomas Elwood, DrPH,** Executive Director, Association of Schools of Allied Health Professions

- **Allison Foster, MBA,** Deputy Executive Director, Assoc of Schools of Public Health

- **Elaine Rubin, PhD,** Vice President for Program, Assoc of Academic Health Centers

- **Beverly Malone, PhD, RN, FAAN**, Chief Executive Officer, National League for Nursing

- **Steve Shannon, DO, PhD**, President, American Association of Colleges of Osteopathic Medicine

- **Moraith G. North,** Executive Director, American Association of Colleges of Podiatric Medicine

- **Martin Wall, MPA,** CAE, Executive Director, Assoc of Schools & Colleges of Optometry

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D – Glossary of terms used in this report

1) **Interprofessional education** (IPE) is defined as “any type of education, training, teaching or learning session, in which two or more health and social care professions are learning interactively.

2) **Lifelong learning** is the "lifelong, life wide, voluntary, and self-motivated" pursuit of knowledge for either personal or professional reasons. As such, it not only enhances social inclusion, active citizenship and personal development, but also competitiveness and employability.

3) **Method and format of continuing education** include traditional types of classroom lectures and laboratories, distance learning, which not only includes independent study, but which can include Workplace learning is the integrated use of learning and other interventions for the purpose of improving individual and organizational performance[1]

4) **Workplace learning** is the way in which individuals or groups acquire, interpret, reorganize, change or assimilate a related cluster of information, skills and feelings. It is also primary to the way in which people construct meaning in their personal and shared organizational lives.”

5) **Point of care learning**, the learning which occurs at the time and place (whether virtual or actual) of a health professional/patient encounter.

6) **Knowledge transfer** in the fields of organizational development and organizational learning is the practical problem of transferring knowledge from one part of the organization to another organization (or all other) parts of the organization.

7) **Knowledge management** is the “systematic process of identifying, capturing, and transferring information and knowledge people can use to create, compete, and improve.”

E – Table of Recommendations and Targeted Audiences

Targeted Audience						
Recommendation	CE Providers	Academic Institutions/ Higher Education Organizations	Educational Supporting Organizations/ Licensing Bodies	Healthcare, Educational Accrediting Bodies	Policy Makers	HC Institutions/ Insurers
2.1 Assimilate and disseminate evidence to the public, policy makers, and regulatory agencies regarding CE and lifelong learning's contribution to improving health care quality and safety, cost-effectiveness of care and improved access.	√	√	√			√
2.2 Embrace a new construct of lifelong learning which includes the development, fostering and testing of knowledge management and related skills necessary from entry to health professional education through one's practice career.		√	√	√		√
2.3 Embrace an interprofessional education (IPE) model or construct. That model must be patient-centered and flexible, and encompass a significant and measurable component across the entire educational continuum from entry into health professional education and throughout one's career.	√	√	√	√	√	√
2.4 Continue to investigate and implement the most effective CE methods to support providers, practices and health systems to integrate and	√	√		√	√	

improve healthcare quality and safety.						
2.5 Fund and support the development and re-education of CE providers to achieve the goals of a newly envisioned, cost-effective CE system and to support effective lifelong learning across the health professions.	√		√		√	√
2.6 Support the increased development and use of work-place learning strategies, including POC learning.	√	√	√	√	√	√
2.7 Embrace POC learning strategies. This includes the facilitation of research on POC learning including self-assessment mechanisms and the use of required technological approaches to improve practice and the simplification and streamlining of credit systems for POC activities.	√	√	√	√	√	√
3.1 Develop, test and refine curricula which emphasize and reflect the value of lifelong learning and incorporate lifelong learning skills. Accrediting bodies must incorporate measurable LLL outcomes into standards and program expectations.		√		√		√
3.2 Comprehend and support the principles of lifelong learning in education activities and regulatory processes, including credit systems, standards and assessment processes	√	√	√	√		
3.3 Conduct business in a manner that supports and incorporates the value of lifelong learning, and the				√		√

skills necessary to make its adoption a reality for the professionals associated with their organizations						
4.1 Consider and incorporate meaningful, formal and experiential, interprofessional education in entry-level and advanced training of all health professionals. This should include, but are not limited to, curricular re-design, creation of experiential learning opportunities, evaluation of IPE activities, and design/implementation of IPE continuing education programs specific to work settings.	√	√				√
4.2 Develop and assess interprofessional team competencies in conjunction with health professional organizations.				√		√
4.3 Support and create strategies for meaningful, outcomes-oriented IPE. Including streamlined curricula and program design and development of certification processes that encourage IPE, complementing the individual professional accreditation components and systems. In addition, standardized CE accreditation processes should address both intra and interprofessional educational and performance criteria that are not solely profession specific.	√	√		√		
4.4 Create or collaborate to ensure multiple opportunities for meaningful, interactive health professional				√		√

learning experiences that provide feedback on the health professional's performance. In addition, the healthcare institutions' accrediting and regulatory bodies should incorporate requirements for IPE experiences into standards and policies.						
5.1 Embrace and value a more effective CE system, supporting the implementation of a broad range of more effective methods, activities and interventions to ensure relevance to healthcare practitioners and the healthcare system and to improve patient care.					√	√
5.2 Increase engagement in professional development processes, including teaching strategies and methods to re-shape the delivery of CE and address diverse learning styles and needs of practicing clinicians.	√	√	√			
5.3 Continue, accelerate and strengthen efforts to support alignment of CE methods to be congruent with health system and health professional needs, and the delivery of evidence-based, effective CE methods.	√					
5.4 Adopt requirements regarding continuing education that incorporate evidence-based, effective methods and strategies to create a more credible and universal CE vehicle that fosters the public trust.				√		
6.1 Value, fund and support the construct of workplace learning within	√	√	√	√	√	√

current healthcare systems.						
6.2 Recognize the importance and value of health professionals' demonstrable participation in workplace learning.	√	√		√		
6.3 Assist in the design, implementation, and testing of systems which integrate education, learning, practice and workplace settings.	√	√	√			√
6.4 Support pilot and more extensive studies of workplace learning to develop a fully integrated education and workplace learning system.		√				√
7.1 Support the development and testing of strategies for Point-of Care (POC) learning and should incorporate Point-of-Care learning technology, resources and education methods.				√		√
7.2 Incorporate point-of-care learning as an integral component of lifelong learning across the educational continuum.	√	√	√			
7.3 Undertake faculty development efforts to better train tutors, role models and teachers in the use of point of care learning.		√	√			
7.4 Recognize the importance of point-of-care learning by creating user friendly, IT-enabled and easily accessible mechanisms for the recognition of users of POC learning.	√			√		√
7.5 Develop tools and methodologies for delivering point-of-care						√

information and integrating learner self-assessment and practice performance.						
7.6 Support the need for more innovative, coordinated research in point-of-care learning, with an emphasis on outcome measurement, theory (conceptual models) and innovations.		√	√			√

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