Educating Health Professionals to Use An Evidence Base

Current Reality, Barriers, and Related Actions

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Introduction

In March 2001, the IOM released *Crossing the Quality Chasm*. The report emphasized that health care today harms too frequently and routinely fails to deliver its potential benefits. In short, "between the health care we have and the care we could have lies not just a gap, but a chasm." The report shows that during the last decade alone, more than 70 publications in leading peer-reviewed journals have documented serious quality shortcomings (2001).

There are a number of changes affecting health care delivery, including a shift from acute to chronic care, the need to integrate a continually expanding evidence base and technological innovations, more clinical practice occurring in teams, complex delivery arrangements, and changing patient–clinician relationships (2001).

In response to the changes underway, the health care workforce needs to be adequately prepared. Responding to the changing needs of the populations and making use of new knowledge requires that health professionals develop new skills or assume new roles.

At the same time, there is a need to modify the ways in which health professionals are accredited and regulated. Scope-of-practice acts and other workforce regulations need to allow for innovation in the use of all types of clinicians to meet patient needs in the most effective and efficient way possible. It also requires that training and ongoing licensure and certification reflect the need for lifelong learning and evaluation of competencies (2001).

The *Chasm* report calls for a major overhaul of the health care system. In the report's chapter *Preparing the Workforce*, there is an outline of the types of new or enhanced skills required by health professionals to function in this changing environment. These skills can be grouped under five main topical headings: patient-centered care, evidence-based practice, informatics, interdisciplinary teams, and quality improvement. The following outlines some of the basic skills required in each topic area (2001).

- ?? *Informatics -* Communicate, manage knowledge, and support decision making using information technology.

- ?? *Interdisciplinary Teams -* Cooperate, coordinate, communicate, and standardize care in teams to make care more patient-centered, continuous, and reliable.

- ?? *Evidence-Based Practice -* Integrate best research with clinical expertise and patient values.

- ?? *Patient-Centered Care* - Inform and involve patients and their families in medical decision making and self management; coordinate and integrate care; provide physical comfort and emotional support; understand patients' concepts of illness and their cultural beliefs; understand and apply principles of disease prevention and behavioral change appropriate for diverse populations.

- ?? *Quality Improvement* - Continually understand and measure quality of care in terms of structure, process, and outcomes; design and test interventions to change processes and systems of care with the objective of improving quality; identify errors and hazards in care; and understand and implement basic safety design principles, such as standardization and simplification.

As the *Chasm* report outlined, there have been many prior examinations of clinical education, particularly medical education. The striking feature of these reform efforts is their similarity in the problems identified and proposed solutions (Christakis, 1995) (Enarson and Burg, 1992). As the *Chasm* report stated with respect to medical education:

Christakis (1995) reviewed 19 reports and found eight objectives of reform among them: serve changing public interest, address physician workforce needs, cope with burgeoning knowledge, foster generalism and decrease fragmentation, apply new educational

methods, address the changing nature of illness, address the changing nature of practice, and improve the quality and standards of education.

Despite the changes that have been made, the fundamental approach to clinical education has not changed since 1910 (2001).

The IOM Health Professions Summit hopes to build upon earlier reform efforts by bringing together a multidisciplinary group of leaders to develop concrete strategies and action steps that they will take over the next 1-3 years. It is hoped that the combination of dramatic changes underway and anticipated in the health system, as well as the breath and scope of quality problems that exist will serve to motivate these leaders to move beyond professional and organizational turf issues and together create meaningful and realistic next steps for reform of health professions education. This summit starts with participants working on one of the five topic areas outlined above.

The following explores the existing evidence-base related to education of health professionals in evidence-based practice, the educational and regulatory barriers to integrating this topic area in the academic and continuing education settings, proposed actions for overcoming these barriers, and model schools or educational programs offering curricula in this topic area. Embedded in this paper are questions that will serve to initiate the development of strategies for reform of health professions education.

Definition and Vision of Evidence-Based Practice

At the most basic level, evidence-based practice is the integration of best research with clinical expertise, patient values and available resources (Institute of Medicine, 2001) (Ciliska D.K. et al., 2001).

More specific definitions include a focus on life long, self-directed learning in which caring for individual patients or groups of patients "creates the need for clinically important information about diagnosis, prognosis, therapy, and other clinical and health issues…requiring a bottom up approach that integrates the best external evidence with individual clinical expertise and patient choice (Etminan et al., 1998) (Ingersoll, 2000) (Wolf, 2000)."

The definition of evidence has become broader over time and there does not appear to be a consensus across the professions. The definition includes evidence that can be quantified, such as randomized controlled trials, evidence based on qualitative research and evidence derived from the practice knowledge of experts, including inductive reasoning (Guyatt et al., 2000) (Higgs et al., 2001). Some argue that clinicians must think in terms of hierarchies of evidence and always seek the highest degree of available evidence to inform their practices. The patient's values and circumstances––including financial resources and social supports––also must be considered as part and parcel of an evidence-based practice. Patients may pursue alternative therapies that have a limited evidence base; then again, for many traditional therapies there is little to no evidence (Guyatt et al., 2000) (Jennings and Loan, 2001).

In the ideal system of the future, the knowledge base about effective care and its use in health care settings will constantly expand through improved methods of accessing, summarizing, and evaluating information and making it available at the point of care for the patient (Institute of Medicine, 2001). Integrating research about the effectiveness of health care interventions into practice can minimize quality problems associated with underuse, overuse, and misuse (Walshe and Rundall, 2001).

Evidence-Based Practice in the Practice Environment

Although the notion of evidence-based practice is not new, there has been a concerted effort, with the support of information technology, to diffuse evidence-based practice over the last decade, beginning with medicine and moving to other professions. (Walshe and Rundall, 2001).

Considerable progress has been made on identifying and disseminating research findings about effective clinical practice including: journals that summarize primary research; development by the Agency for Healthcare Research and Quality (AHRQ) of a national clearinghouse for clinical guidelines; AHRQ's launch of evidence-based practice centers to produce and disseminate evidence reports and technology assessments; the National Institute of Health's (NIH) Consensus Development Program (National Institute of Health, 2002); and development of secondary databases of relevant research (e.g., Cochrane Collaboration) (Walshe and Rundall, 2001).

Most of the evidence in such databases relates to medical interventions and various other groups are working to identify and disseminate evidence related to their professions and to integrate evidence across the professions (Etminan et al., 1998) (Lang, 1999). With respect to nurses, this gap may be, in part, because the data of concern is largely not captured in clinical and administrative data systems and so cannot be retrieved for further study (Lang, 1999). In response, nursing leaders advocate for a focus on identifying and standardizing nursing evidence and combining it with medical evidence in order to achieve the best possible outcome for patients (Zielstorff, 1998) (Denehy, 1998) (Lang, 1999). A minority question if evidence-based practice has more limited applicability to nursing, arguing that "the evidence that informs technique and procedure does not provide knowledge about the essence of nursing practice—caring for human beings as they experience personal health situations (Mitchell, 1999)."

Clinicians are looking for help in evaluating the quality of studies and in identifying studies with direct implications for patient outcomes. Critical appraisals are becoming increasingly popular as a way to filter out studies that do not meet validity criteria (Woolf, 2000). Other resources, such as *The Journal of Family Practice,* filter out studies that are not only valid but also relevant. Of over 8,000 original research articles potentially relevant to primary care physicians identified over a 6-month period, this journal designated only 211 (2.6%) as Patient Oriented Evidence that Matters – or POEMs (Ebell et al., 1999).

While there is evidence that dissemination of effectiveness research has improved patient outcomes in discrete venues, such as treatment of low-back pain, acute myocardial infarction, and other conditions (Goldberg et al., 2001) (Mehta et al., 2002), there is little evidence to suggest that effectiveness research has had a large effect on overall clinical practice, and the evidence that does exist is somewhat equivocal (Walshe and Rundall, 2001). Studies in the United Kingdom suggest that evidence-based practice has "changed the tenor and content of local decision making and has helped to bring about important changes in practice (Walshe and Rundall, 2001)." Wolf concludes that "translating evidence into practice can be more difficult than generating evidence," and that it takes more than having access to information to change practice (Wolf, 2000).

Specific skills that evidence-based practice requires include the ability to: formulate clinical questions and search for evidence-based answers (reflecting discipline-specific and interdisciplinary accountabilities); appraise reviews; and decide when and how to incorporate new findings into practice (Rosswurm and Larrabee, 1999) (Grad et al., 2001). Problem-based learning can facilitate development of critical appraisal skills and collaboration between researchers and practitioners within and among disciplines can enhance the diffusion of evidence-based practice innovations (Rosswurm and Larrabee, 1999) (Lusardi et al., 2002).

State of Education in Evidence-Based Practice

Across the professions, the availability of evidence-based practice curricula varies as do accreditation related requirements. The Accreditation Council for Graduate Medical Education (ACGME) requires "medical knowledge" as one of its six core competencies–– defined as established and evolving biomedical, clinical and cognate sciences and the application of this knowledge to patient care––without being prescriptive as to how this competency is obtained (ACGME, 2002). The National League for Nursing Accreditation Commission (NLNAC, 2002) requires that nurses develop critical thinking skills; the Commission on Collegiate Nursing Education standards do not appear to speak to evidence-

based practice directly. One of the American Council on Pharmaceutical Education's (ACPE) 18 required competencies relate directly to evidence-based practice, namely retrieving, evaluating, and managing professional information and literature (Hobbs, 2002).

Most medical schools are teaching evidence-based practice skills. A 1999 Association of Academic Medical Centers (AAMC) survey found that 88 percent of medical schools were teaching evidence-based medicine skills, with over three quarters of 1999 graduates saying that they thought the amount of time devoted to such instruction was adequate. However, more than a quarter of these graduates reported feeling unprepared to interpret clinical data, research, literature reviews, and critiques (AAMC , 1999). A national survey of internal medicine residency programs found that 37 % of them had a freestanding evidence-based practice curriculum. Of those, 78% focused on critical appraisal skills, 53% on searching for evidence, 44% on posing focused questions, and 35% on applying evidence in decision making. Less than two-thirds of all internal medicine programs provided on-site electronic information and less than half provided site-specific faculty development in evidence-based practice skills (Green, 2000).

In the pharmacy arena, most programs that grant doctor of pharmacy degrees required coursework in research methodology, statistics, drug information, and literature evaluation, with research methodology required least often. Only 12.9% required an extensive project with data collection, analysis, and write-up (Murphy et al., 1999). A focused, short-term effort to teach evidence-based decision making skills to faculty in allied health programs for use in their curricula was perceived as effective (Forrest and Miller, 2001). The extent of such curricula in allied health and nursing is unknown.

How effective is the teaching of evidence-based practice skills? A study that reviewed articles from 1966 to 1995 about teaching critical appraisal skills in medical school found that such instruction can enhance knowledge of epidemiology in undergraduate programs but not necessarily at the residency level (Norman and Shannon, 1998). A more recent article examining 10 controlled studies cautiously found, though the studies were not that rigorous, that both medical students and residents had an enhanced knowledge of epidemiology and biostatistics and a better ability to assess medical literature after receiving training in critical appraisal skills. The study did not assess how well that knowledge translated into practice (Taylor et al., 2000).

More recently, efforts have been made to develop tools to measure the effectiveness of evidence-based teaching. One such tool––tested by health professionals with a range of evidence-based practice experience––was found to be a satisfactory way to evaluate the effectiveness of evidence-based practice teaching (Taylor et al., 2001). Another tool was found to be effective in both assessing the skills associated with evidence-based practice and evaluating the ability of the student to apply evidence in managing a common clinical problem (Bradley and Humphris, 1999).

Overall Barriers to Achieving this Vision

Rapidly Growing Resource Base

The evidence base is growing at a rapid rate, which results in a significant commitment of both time and money to develop and update meta-analyses. Some studies show, however, that the benefits of updating meta-analyses outstrip the costs (Wolf, 2000) (Walshe and Rundall, 2001).

Integrating Evidence into Practice

Clinicians do not have easy access to timely, relevant evidence-based information. Where it exists, they are challenged to integrate it into their practice––given time constraints, external demands and demands of their work environments, including the complexity of large health care organizations (Guyatt, 1992) (Larme and Pugh, 2001) (Walshe and Rundall, 2001).

Costs and Other Issues

There are significant costs and technical challenges to developing clinical decision support systems that support evidence-based practice. This is compounded by the invisibility of nursing's contributions, which largely are not captured in computerized records and clinical and administrative databases (Lang, 1999).

Lack of Authority

Nurses and other health professionals may not always have the authority to change practice within an organization, based on evidence (Parahoo, 2000).

Legal Issues

Evidence-based practice may be used selectively to define medical necessity and appropriateness in court or other venues. This has the potential to undermine support for evidence-based practice among clinicians and managers.

Educational Barriers to Achieving this Vision

Unenthusiastic Faculty

Many faculty are unenthusiastic about modifying teaching to further evidence-based practice. With respect to the training of physicians, there also are limited residency programs and attendings that teach and reinforce evidence-based practice (Guyatt, 1992).

Unprepared Students

Many students start with elementary critical appraisal skills. Studies show that these students are intimidated or do not feel they have the time to learn what they need to know in order to become proficient in evidence-based practice (Guyatt, 1992) (Ciliska D.K. et al., 2001).

Limited Resources

Training settings are hard pressed to invest in the information technology that can enable students to gain experience in evidence-based practice.

Myths and Misconceptions

There are many misperceptions about evidence-based practice across the professions, including that the approach ignores clinical experience and instinct, as well as standard aspects of clinical care (Guyatt, 1992). There also is concern that evidence-based practice will slow innovation and is too reliant on quantitative research methods (Walshe and Rundall, 2001).

No evidence

When environments start focusing on evidence-based practice, there are challenges in also preparing students to make decisions when there is little evidence to guide them, e.g., where does the burden of proof lie––therapies are considered useful until proven otherwise or useless until proven effective (Welch, 2000)?

Proposed Actions Needed to Overcome Barriers

Conduct and Disseminate Research

Studies could be commissioned––and broadly disseminated––that focus on the effectiveness of evidence-based practice on patient care. One researcher notes that the best way to communicate the effectiveness of evidence-based care is in terms of relative risk reduction to educators and practitioners (Wolf, 2000).

Bring Faculty Along

Teach faculty the necessary evidence-based practice skills and reward them for modeling an evidence-based approach in classroom and training settings.

Address Disciplinary Differences

Educators should not only understand the differences in how evidence-based practice is conceived across the disciplines but consider what this means for education and practice.

Reform Accreditation

Many, although not all, accrediting organizations include evidence-based practice as a core competency. In addition to considering what evidence-based practice skills mean for curricula, they should consider the implications for training environments, e.g., require that such environments include use of practice guidelines and evidence-based decision support systems.

Innovative Continuing Education/Schools in Evidence-Based Practice

The following were identified in the literature or through Web searches. This is not an exhaustive list––it is largely made up of programs that took the time to document, evaluate, and publish their efforts.

Baystate Medical Center, Springfield, MA The nursing division developed a pragmatic definition of evidence-based practice, outlined steps to institutionalize evidence as a routine part of nursing practice and has examples of where the approach has worked (Stetler et al., 1998).

Boston University Medical School, Boston MA. Instituted a mini evidence-based practice course for third-year medical students and compared outcomes for those students against a control group. Researchers found that evidence-based practice had a positive impact on student skills and attitudes (Ghali et al., 2000).

Cook County Hospital and Rush Medical College, Chicago, Ill. Instituted an evidence-based medicine course for first-year internal medicine residents taught by senior faculty and chief residents. A comparison of these students with a control group found that the structured educational intervention over a seven-week period produced substantial and durable improvements in residents' cognitive and technical evidence-based practice skills (Smith et al., 2000).

Department of Family Practice, Michigan State University, MI. Introduced a nine-session evidence-based practice curriculum at six community campuses for third year students in family medicine. An evaluation of the curriculum compared students who went through it to a control group and found that those who were trained reported higher levels of confidence in critical appraisal and research skills. The evaluation also found that the students appreciated the training more after one year of residency than at graduation, however, there was no change in research activity among residents (Wadland et al., 1999).

Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco, CA. Initiated a series of student seminars that foster critical reading of the literature, coupled with evidence-based ward rounds. During the rotation, each student formally reviews one topic in women's health using the U.S. Preventive Services Task Force rating system. Although there was no quantitative assessment of this approach, student feedback was enthusiastic (Grimes et al., 1998).

Faculty Development Institute Focused on Evidence-Based Practice in Allied

Health A national four-day Faculty Development Institute (FDI) program for dental hygiene, occupational therapy, and physical therapy faculty that assessed evidence-based practice knowledge, skills, and teaching strategies in advance, taught skills on-site and followed up with respect to curriculum integration. A survey of participants showed a statistically significant increase in knowledge, and 100% agreed or strongly agreed that they were prepared to integrate evidence-based decision making into their courses. (Forrest and Miller, 2001)

Hartford Hospital, Department of Nursing and University of Connecticut, School of Nursing, Harford, CT. Health care and academic organizations collaborated to support evidence-based nursing practice with an annual research utilization conference, a series of research roundtables, talks with nurse authors, and a website. The collaboration was set up with the hope of encouraging more rapid dissemination of research findings into practice, enriching nursing practice, and ultimately improving patient outcomes (Caramanica L. et al., 2002)

McMaster University Health Sciences Center, Ontario CN. In the early 1990s, McMaster instituted an evidence-based curriculum in medical residency, focused particularly in internal medicine. A comparison of random samples of McMaster graduates and those from a traditional school found that the McMaster graduates were more knowledgeable about hypertension guidelines, suggesting that evidence-based curricula may help graduates stay up to date (Guyatt, 1992) (Norman and Shannon, 1998).

School of Medicine, West Virginia University, WVA. Launched evidence-based medicine journal clubs, which got high marks from faculty members and residents, with more mixed evaluations from students. Residents and faculty rated the evidence-based practice sessions more favorably than grand rounds or the resident lecture series. Those further along in their education may gain more from the experience than students (Elnicki et al., 1999).

Summit Questions

On day one of the summit, participants will work in small, interdisciplinary working groups in drafting strategies around one of five topics––evidence-based practice, quality improvement, informatics, interdisciplinary teams, patient-centered care.

Based on the review of the literature, the IOM committee members have suggested that the following questions are the most important to be addressed for the evidence-based practice group. If you think there are other important questions around this topic to address, you'll have an opportunity to refine or add to this list before the small group work begins.

Please consider the following:

- ?? What strategies could be used so that academic and lifelong learning across the health professions includes the building of competencies in evidence-based practice, e.g., critical appraisal?

- ?? What strategies could be used to overcome myths related to evidence-based practice so that there is more acceptance of this approach to care delivery in education environments across all the health professions?

- ?? What strategies could be used so that the evidence bases of the various professions could be linked?

- ?? What strategies could be used to promote the evaluation and testing of evidence-based practice across the professions?

- ?? What strategies might be used so that faculty are better prepared to teach skills related to evidence-based practice?

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