

medical profession and patient advocacy groups, government officials, business leaders, insurance executives, media outlets, and others will be necessary for the creation of an alliance with sufficient influence to effect needed changes.

The urgency of establishing a working medical-societal alliance cannot be overstated. If professionalism among physicians is not sustained, it is doubtful that its ethical norms, once lost, could ever be reestablished. The result would likely be a replacement of the traditional patient-physician relationship with one more characteristic of a purchaser-vendor transaction. Such devolution would leave society without adequate protection from the vicissitudes of 21st-century medicine and would leave patients without individualized care devoted to their best interest.

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# Improving Patient Care by Linking Evidence-Based Medicine and Evidence-Based Management

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**N**OT UNTIL ABOUT 100 YEARS AGO COULD A TYPICAL patient expect to benefit from the medical care provided by a typical physician. Today most patients benefit from medical care, but all patients could benefit more if clinicians routinely provided care consistent with the latest scientific knowledge. One report suggests that only 55% of US adults receive care consistent with current recommendations.<sup>1</sup> In 2001, the Institute of Medicine concluded that a chasm lies “between the healthcare we have and the healthcare we should have.”<sup>2</sup> Moreover, the results of efforts to improve medical quality have been modest and uneven to date.<sup>3</sup>

Two components are necessary to improve the quality of medical care: advances in evidence-based medicine (EBM), which identify the clinical practices leading to better care,

ie, the content of providing care,<sup>4</sup> and knowledge of how to put this content into routine practice. These advances in evidence-based management (EBMgt) identify the organizational strategies, structures, and change management practices that enable physicians and other health care professionals to provide evidence-based care, ie, the context of providing care.<sup>5</sup> Until both components are in place—identifying the best content (ie, EBM) and applying it within effective organizational contexts (ie, EBMgt)—consistent, sustainable improvement in the quality of care received by US residents is unlikely to occur.

## Providing High-Quality Care

Ensuring the delivery of high-quality care requires integration of knowledge from EBM and EBMgt. The content of

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what should be done—eg, evidence on which drug, medical device, procedure, or treatment plan is most likely to improve patient outcomes—needs to take into account the organizational and community context in which the care is delivered. Randomized clinical trials (RCTs) emphasizing internal validity are the gold standard for creating EBM, but have limited generalizability to patients, clinicians, and treatment settings different from those in the RCTs.<sup>6</sup> Practical or pragmatic clinical trials can address some of the generalizability issues but can be costly and generally do not address explicitly the underlying organization of care.<sup>7</sup> EBMgt focuses on the underlying organizational issues that influence how care is delivered. The evidence base comes largely from the social and behavioral sciences, human factors engineering, and the field of health services research. In addition to RCTs, EBMgt uses observational data and approaches such as the PDSA (plan-do-study-act) quality-improvement method for making small-scale changes to improve care.<sup>8</sup>

An example of the value of using EBM and EBMgt together is treatment of patients with acute coronary syndromes. Evidence-based guidelines recommend that symptomatic patients presenting in the emergency department receive immediate evaluation, in an effort to decrease the time between the onset of symptoms and the initiation of treatment. In practice, not all patients at risk for an acute coronary syndrome receive prompt evaluation or treatment because of factors that can vary across emergency departments, eg, triage bottlenecks due to limited space.<sup>9</sup>

One hospital, however, reduced its door-to-balloon time for patients with acute myocardial infarctions (AMIs) after reviewing the existing management research on workflow processes and drawing on case studies from similar hospitals for ways to initiate electrocardiograms faster in symptomatic patients.<sup>9</sup> This hospital was able to use EBMgt knowledge to help put EBM into practice.

Substantial clinical evidence and established guidelines recommend the use of certain medications in patients with AMI; yet, use of  $\beta$ -blockers after an AMI continues to be uneven across hospitals. Four organizational characteristics of hospitals are associated with greater improvement in use of  $\beta$ -blockers over time than that evident in lower-performing hospitals. These include developing shared goals for improvement, providing substantial administrative support, having strong physician leadership, and using credible data feedback.<sup>10</sup>

Using the best knowledge to identify what to do and how to make it part of routine practice appears obvious, but this integration of content and context seldom happens. Within both EBM and EBMgt there are substantial, similar barriers to evidence use: time pressures, perceived threats to autonomy, the preference for “colloquial” knowledge based on individual experiences, difficulty in accessing the evidence base, difficulty differentiating useful and accurate evidence from that which is inaccurate or inapplicable, and lack

of resources.<sup>5,11</sup> Integrating EBM and EBMgt also requires practitioners who are aware of and able to draw on evidence from both. Few physicians read management studies; few managers read clinical studies; and few persons read all relevant studies within their own field.

### **EBMgt for Chronic Illness and Patient Safety**

More than 90 million US residents have at least 1 chronic condition; many have more than 1; and chronic conditions account for nearly 75% of all health care expenditures.<sup>12</sup> Disease registries, clinical guidelines, automatic reminder systems, system redesign processes, physician feedback reports, and patient self-management education programs, ie, elements of the chronic care model, are associated with better patient outcomes.<sup>13</sup> Yet practices in the United States with 20 or more physicians use, on average, fewer than half of the recommended chronic care model elements when caring for patients with asthma, congestive heart failure, depression, and diabetes, and only 1% of such practices use all recommended elements for all 4 conditions.<sup>14</sup>

EBMgt can help expand the use of recommended chronic care processes by providing knowledge about incentives and organizational capabilities. For example, existing research examining the influences of financial rewards to physician practices for meeting quality standards (“pay-for-performance” programs) has found mixed effects.<sup>15-17</sup> Future evaluations of these programs should inform such questions as how much payment is required to induce desired behavior; what are the unintended or negative consequences; whether payment incentives are best placed at the level of the group, the individual physician, or both; and how the payment incentives interact with the practice setting, organizational structure, or other quality-improvement initiatives.

Effective management for patients with chronic illness also requires the effective use of health care teams. An important component is providing teams with the necessary information, resources, autonomy to experiment, autonomy to select members suited to each task, and feedback to track performance.<sup>18</sup> Teams with such characteristics also make a greater number of changes and more in-depth changes (eg, creating disease registries) in implementing elements of the chronic care model to improve care.<sup>18</sup>

Medical care is not nearly as safe as it could and should be. EBMgt can help by using knowledge from human factors engineering,<sup>19</sup> on high-reliability organizations,<sup>20</sup> on changing organizational culture, and on developing high-performing teams.<sup>21</sup> For example, using Lean Production process engineering methods, Virginia Mason Medical Center reports decreasing ventilator-acquired pneumonia cases from 40 per year in 2000 to 5 in 2006, saving an estimated 10 lives and \$1.7 million in costs.<sup>22</sup> Furthermore, a recent study of more than 100 intensive care units found a significant reduction in catheter-related bloodstream infections by developing a comprehensive unit-based safety program,

or CUSP, that involved changing the culture of senior leaders, team leaders, and front-line staff.<sup>23</sup> Specifically, the management evidence suggests that better performance comes from having a culture in which caregivers tell each other about their mistakes, ask for help when needed, share with each other how they have fixed their mistakes, and continually question what is being done and how to do it better.<sup>24</sup>

### Integrating EBM and EBMgt

The nexus of EBM and EBMgt represents an important frontier for improving the nation's health care system. Given the likely increased demand for better and measurably valuable care, combined with increasing cost and quality pressures and calls for health care reform, the following suggestions may be helpful for promoting the integration of EBM and EBMgt and for reducing the barriers to their use.

**Synthesizing the EBMgt Knowledge Base.** The federal government should consider establishing a national evidence-based health care management center. For example, the Agency for Healthcare Research and Quality could extend its Evidence-Based Practice Centers initiative with input from the National Quality Forum and related groups. The program's primary responsibilities would be to ensure that management/organizational research data are rigorously assessed and synthesized, such as with meta-analyses; made widely available in usable forms for managers and clinicians; and effectively linked to other evidence-based management and medicine repositories. Related efforts from other countries include the National Institutes for Clinical Excellence in the United Kingdom, which has established an NHS (National Health Service) program for service delivery and organization (<http://www.sdo.lshtm.ac.uk/>); the Cochrane Collaborative on Effective Practice and Organization of Care Group; the UK National Library for Health (<http://www.nelh.nhs.uk/>); and the Canadian Health Services Research Foundation with the development of HEALnet (<http://www.chsrf.ca/>). The national program also would provide an annual assessment of gaps in knowledge and suggest areas for further research attention for funding agencies and the research community. Of particular importance is the need for rigorous, scientifically sound syntheses of organization-wide interventions and initiatives to improve the uptake of evidence-based clinical guidelines and practices, to increase patient safety, and to improve the overall quality of care provided.

**Adding to the EBMgt Knowledge Base.** Practice-based research networks should be expanded, such as Agency for Healthcare Research and Quality's Accelerating Change and Transformation in Organizations and Networks. This network involves partnerships of hospitals, health plans, physician organizations, and researchers to address questions regarding the scientific evidence on what does and does not work to improve care in real-world settings. Similarly, the joint National Academy of Engineering/Institute of Medi-

cine Report on Building A Better Delivery System<sup>19</sup> has recommended that Congress fund university-based practitioner-linked Engineering/Healthcare Management Research Centers that bring together engineers, clinicians, researchers from multiple disciplines, and executives to work on expanding the applications of tools and methods for improving care, evaluating the applications, and rapidly sharing the learning. The federal government also can require that all Medicare demonstration projects involve explicit evaluation of patient outcomes as well as implementation efforts, ie, both content and context. These initiatives should be linked with the National Institutes of Health translational roadmap research agenda and are consistent with the goal of translating scientific knowledge from the bench to the bedside to the community.

**Creating the Market for EBM and EBMgt Integration.** External accreditation, certification, and licensing bodies should consider "evidence" of EBM and EBMgt linkages in their reviews. While such reviews should emphasize outcomes rather than the methods used to achieve them, organizations and individuals should be held accountable for not using evidence-based approaches, much like clinical performance efforts target both process and outcome end points. The Quality Improvement Organizations of the Centers for Medicare & Medicaid Services can provide assistance in the implementation of EBM as well as EBMgt and ensure that interventions to improve care use the best available evidence from both.<sup>25</sup> These entities can help create a national expectation that clinicians and managers will work together to identify issues, formulate questions and interventions, and work with the research community to address both content and context. Furthermore, hospital and health system governing boards might create financial incentives for managerial and clinical leaders to implement evidence-based changes that result in improved quality and cost performance.

**Developing the Intellectual Capital to Support Integration.** There is great need for improving the education of all health care professionals in the use of EBM and EBMgt. Relevant topics would include assessment of what constitutes credible and applicable evidence, how to conduct meta-analyses and systematic reviews, and how to apply evidence in everyday practice. Clinical residency and management accreditation groups should consider including these topics in their list of requirements for training programs.

### Conclusion

Practice and policy recommendations and interventions are needed to bring both components—EBM and EBMgt, the content and the context—together to provide better patient care. Only an integrated evidence-based approach can reduce the quality gap and instill greater confidence in the US health care system.

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# Toward Evidence-Based Policy Making and Standardized Assessment of Health Policy Reform

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**I**N THE UNITED STATES, DEFICIENCIES IN HEALTH CARE quality, value, and access are well documented.<sup>1-5</sup> Recent trends such as pay-for-performance, increased patient cost-sharing, and state health insurance expansion programs may represent important reforms and even a "tipping point" for the US health care system.<sup>6,7</sup> Nevertheless, experts have cautioned that not only could unintended consequences occur but that no systems are in place to ensure accountability among policy makers.<sup>6,8,9</sup>

For example, a company switches its workers to high-deductible health plans. Because of increased out-of-pocket costs, a low-income employee with diabetes begins deferring care, resulting in worsened blood glucose control. Meanwhile, the employee's physician is paid more if a

certain proportion of his or her patients with diabetes achieve glycated hemoglobin levels below 7%. Two outcomes are possible: the physician may continue to care for such patients and accept lower compensation or may choose to terminate the clinical relationship to avoid the financial penalty.<sup>10</sup>

In the first outcome, a quality-improvement system promoted by health plans and employers (pay-for-performance) penalizes the physician for a cost-control measure (high-deductible insurance) also created by health plans. In the second, the policies create a conflict of interest for the physician

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