

Improving the Quality of Medical Care

Building Bridges Among Professional Pride, Payer Profit, and Patient Satisfaction

Richard Grol, PhD

ATTENTION TO THE QUALITY OF patient care has become an important health care issue in the last decade, not only among authorities, policymakers, and managers, but also among physicians and patients. Articles¹⁻⁶ published in top medical journals regularly highlight problems with health care delivery, such as underuse, overuse, and/or misuse of care. Blumenthal⁷ believes that physicians should fully understand the debate on quality or they may lose the confidence of patients. The question for practitioners, however, is how to improve clinical performance.

A variety of approaches have been introduced during the last decade, and all of them claim to provide solutions to some of the main problems in patient care. Approaches such as evidence-based medicine (EBM), total quality management (TQM), assessment, accreditation and accountability, professional development, patient empowerment, and others have gained popularity. These approaches represent different perspectives on the best methods for improving care (TABLE 1). Some approaches focus on professionals, and others on organizations; some emphasize the value of self-regulation, and others believe in external control; some prefer a bottom-up method, and others a top-

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Physicians today are confronted with increasing demand to ensure and improve care of their patients. A variety of approaches claim to provide solutions to the problems of health care delivery. These approaches represent different perspectives on optimal care and the best method for improving care. By summarizing recent reviews and debates in this field, this article critically reflects on the value of some of the approaches that have gained popularity during the last decades: evidence-based medicine and clinical practice guidelines, professional development, assessment and accountability, patient empowerment, and total quality management. Evidence regarding the impact and feasibility of the various approaches is mixed or simply lacking. In particular, the health care community lacks an understanding of which approaches are most appropriate for what types of improvement in what settings and of the determinants of successful performance change. Given the complexity of improvement and change in patient care, it is not realistic to expect that one approach can solve all the problems in health care delivery. None of the popular models for improving clinical performance appear to be superior. Therefore, bridges must be built and models must be integrated to be truly effective.

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down method. Although efforts to integrate these approaches can be observed, different parties in health care usually adopt one specific approach without taking into account the achievements of the others.

In light of the current debate on health care improvement, the individual clinician may raise the question of what the best approach may be and which approaches contribute to improved patient care. Most articles in this field focus on one specific approach or method for quality improvement. The purposes of this article are to critically reflect on and compare a series of current popular approaches to improv-

ing patient care and to summarize the available evidence for their value. In particular, this article attempts to summarize the current debate about the achievements of the current approaches and show how bridges might be built among them. The focus of this article is on the improvement of professional performance and not on organizational change.

Author Affiliation: Centre for Quality of Care Research, Nijmegen University, Maastricht University, The Netherlands.

Corresponding Author and Reprints: Richard Grol, Centre for Quality of Care Research 229, PO Box 9101, 6500 HB Nijmegen, the Netherlands (e-mail: R.Grol@hsv.kun.nl).

METHODS

For the critical reflection, I used a search for systematic reviews on improving the quality of care and implementing change performed in our department; 36 systematic reviews that addressed a variety of quality improvement strategies and followed accepted methods were analyzed in detail.⁸ The findings are summarized in TABLE 2. The Cochrane Library⁹ was checked for specific reviews on implementing change. In addition, some of the main general medical journals (*New England Journal of Medicine*, *JAMA*, *BMJ*, *Lancet*, *Annals of Internal Medicine*, and *CMAJ: Canadian Medical Association Journal*) and relevant health services research journals (*Health Services Research*, *Milbank Quarterly*, *The Joint Commission Journal on Quality Improvement*, *Quality in Health Care*, *Medical Decision Making*, and *International Journal on Quality Health Care*) were searched by hand for both reviews and articles published from 1995 to 2000 that debated the selected approaches (EBM and guidelines, professional development, assessment and accountability, patient empowerment, and TQM). This search led to additional articles in other journals.

EBM AND EVIDENCE-BASED CLINICAL PRACTICE GUIDELINES

The EBM movement is aimed at helping health care practitioners, patients, and policymakers make decisions with regard to health care by basing these decisions on the best evidence available. This is considered necessary because the number of new scientific insights that emerge each year is overwhelming.¹⁰ International review groups, for instance, in the context of the Cochrane Collaboration, perform systematic analyses of the literature with the expectation that clinicians base their decisions on the best evidence and consult databases containing such reviews. In addition, EBM is presented as a method for continuous learning and for improving care by critically reflecting on clinical performance. However, there is a growing consensus that although physicians like to be in-

Table 1. Approaches to Quality Improvement and Their Assumptions on Improving Medical Care

| Approach | Assumptions |
|--|---|
| Evidence-based medicine Clinical practice guidelines Decision aids | Provision of best evidence and convincing information leads to optimal decision making and optimal care |
| Professional education and development Self-regulation Recertification | Bottom-up learning based on experiences in practice and individual learning needs leads to performance change |
| Assessment and accountability Feedback Accreditation Public reporting | Providing feedback on performance relative to peers, and public reporting of performance data, motivate change in practice routines |
| Patient-centered care Patient involvement Shared decision making | Patient autonomy and control over disease and care processes lead to better care and outcomes |
| Total quality management and continuous quality improvement Restructuring processes Quality systems Breakthrough projects | Improving care comes from changing the systems, not from changes in individuals |

Table 2. Effects of Different Strategies to Improve Patient Care

| Strategy | No. of Reviews | No. of Studies | Conclusions |
|---|----------------|----------------|--|
| Educational materials, mailed information | 9 | 3-37 | Limited effects |
| Continuing medical education | 4 | 3-17 | Limited effects |
| Interactive educational meetings | 4 | 2-6 | Few studies, mostly effective |
| Educational outreach visits | 8 | 2-8 | Particularly affects prescribing and prevention |
| Use of opinion leaders | 3 | 3-6 | Mixed effects |
| Feedback on performance | 7 | 16-37 | Mixed effects, effect on test ordering |
| Reminders | 5 | 5-68 | Mostly effective |
| Substitution or delegation of tasks | 7 | 2-14 | Pharmacist: effect on prescribing Nurse: no effect |
| Use of computer (systems) | 4 | 7-21 | Computerized decision support, mostly effective |
| Total quality management and continuous quality improvement | 1 | 55 | Limited effects, weak study designs |
| Patient-oriented interventions | 7 | 2-34 | Mixed effects, reminding patients mostly effective in prevention |
| Combined and multifaceted interventions | 16 | 2-39 | Mostly (very) effective |

formed of scientific results, they have problems acquiring the skills needed to search and review the relevant literature or to consult databases within the context of their daily work.¹¹⁻¹⁴ For example, new methods for rapid access to evidence through specific services that provide direct answers to clinical questions may offer a solution, but there is little research in this area.¹⁵

The inclusion of scientific evidence within clinical practice guidelines has now become more or less standard in the Western world. Practical, evidence-based recommendations on how to manage health problems are seen by practi-

tioners, payers, and policymakers as potentially powerful tools for the achievement of effective and efficient care, provided that they are well developed and implemented.¹⁶ We can, however, observe some problems here. First, there are currently too many guidelines of low quality. We see a "guideline industry" emerging in many Western countries, and physicians may be overwhelmed by all these guidelines.¹⁷ Many of the guidelines are not based on the best evidence, have not been developed systematically, or present the vested interests of specific parties or industries. Various studies that assess the quality of clinical

guidelines show that most guidelines do not meet important quality criteria.¹⁸⁻²² A second problem with evidence-based guidelines is that, despite a rigorous search and analysis of the scientific literature, clear evidence is available for only part of the practical decisions and actions recommended in the guidelines. There is a large area where expert opinions, preferences of the health care practitioners and patients, and societal priorities are much more important in setting the guidelines than the results of research.²³ Even when adequate evidence is found and summarized, the translation of evidence into recommendations for actual practice often proves difficult. The users of the guidelines regularly address much more heterogeneous populations and more complex care processes involving different health care practitioners than those addressed in the original research.^{24,25} The best manner of managing such processes and chains of related actions has hardly been studied. It also is often difficult to translate the recommendations contained in the evidence-based clinical guidelines into decisions for individual patients because the guidelines can never cover all of the relevant clinical details for specific cases. The consequences of a guideline in terms of acceptance by patients and the resources, staff, skills, and equipment needed are mostly not considered during the development of the guideline.^{26,27} For example, the implementation of a new dyspepsia guideline in the United Kingdom could have resulted in a 3-fold increase in the number of gastroscopies.²⁸ Whether a society is willing to and capable of paying the bill for a particular innovation cannot be determined on the basis of scientific evidence, but instead relates to the setting of priorities.

Even when clear research evidence is available with regard to a particular guideline, it is often interpreted differently by guideline developers in different settings, from different cultures, and with different backgrounds. Fahey and Peters²⁹ compared, for example, the guidelines for the treatment of hypertension with a group of 876 patients at

risk and found that 82% needed treatment when the US guideline was applied, vs 53% with the UK guideline and 15% with the Canadian guideline. The US guidelines for the management of patients with a high risk of breast cancer recommend regular self-examination and preventive mastectomy (requiring only the consent of the patient). The French guidelines, in contrast, do not recommend self-examination (because this may induce fear) and are very strict with regard to mastectomy (as reflected by a waiting period of several months before final decisions are made).³⁰ The authors of this study observe that the setting of evidence-based guidelines is often largely a product of specific cultural beliefs.

One last important problem concerns the effective introduction of evidence and guidelines in daily care. Results of many controlled trials and systematic reviews show that efforts to implement guidelines are often not very successful.^{8,31,32} At best, small-to-moderate improvements in the processes of care have been found (usually not more than 5%-10%), whereas the impact on patient outcomes has often not been studied.^{33,34}

What is the best approach for future work in EBM and evidence-based clinical guidelines? We need an optimal method for guideline development that deals well not only with a systematic search for the evidence, but also with the use of expert opinions, patient preferences, cost considerations, and application in practice. Based on instruments developed in the United States and the United Kingdom, an international group of researchers recently validated a set of criteria (ie, the AGREE [Appraisal of Guidelines for Research & Evaluation] instrument³⁵) for optimal guidelines, including all these aspects. Wide dissemination and use of these criteria may contribute to solving the problem of low-quality guidelines. To improve the use of high-quality guidelines in normal practice, the process of guideline setting should be integrated within a more comprehensive system of quality improve-

ment that also includes translation of the guidelines into protocols, care pathways, and valid indicators for monitoring patient care and effective strategies and programs to implement them.³⁶ Development and evaluation of the effectiveness, costs, and feasibility of such systems is one of the future challenges for quality improvement.

PROFESSIONAL DEVELOPMENT

Often, EBM is criticized for being an overly top-down process and not taking the complexity of actual clinical practice sufficiently into consideration.³⁷ Approaches to the improvement of care involving professional education and development emphasize this complexity and therefore propose bottom-up improvement based on professional pride, self-regulation, and ownership by clinicians. They also emphasize consideration of their individual learning needs and experiences within the context of daily life as a more effective path to optimal care. These approaches are based on theories of adult learning and the assumption that people will inherently strive toward maximum competence and improvement when provided with the appropriate learning environment. In light of the fact that systematic reviews by Davis et al^{38,39} and Oxman et al⁴⁰ have shown classic continuing medical education (CME) approaches (providing educational materials, courses, and conferences) to not be very effective for changing clinical performance, we now see a tendency to adopt new educational approaches with such intriguing names as *continuous professional development*, *self-directed or self-instructional learning*, *problem-based learning*, *portfolio learning*, and *professional revalidation*.^{41,42} Effective learning and improvement are assumed to be more individualized, based on personal learning needs, and require the active participation of the clinician within these approaches. There is considerable optimism among educational experts with regard to these approaches. A recent review by Davis et al³⁹ suggests that learning based on interactive forms of edu-

cation may indeed be more effective than classic CME. Educational outreach visits as part of a more personally tailored approach to the individual needs and problems of the target group appear to be a promising method in the 8 systematic reviews studying the approach, especially for improving prescribing and preventive care.^{8,43} In a review by Wensing et al,⁴⁴ small group learning and peer review by physicians were found to be particularly useful in outpatient office-based practice settings. Nevertheless, there are a number of questions about these new educational approaches as well.^{41,45-47} Information on self-directed and portfolio learning and on professional revalidation from well-designed studies is not yet available, and just which methods are most effective in which settings is not at all clear. We also need to investigate the cost-effectiveness of such new methods because they require considerable staff time and cost for their implementation and maintenance.

A related issue is the level of competence of physicians. There is increasing awareness among clinicians that society expects evidence of their competence.⁴¹ This aspect of the professional development of clinicians is now typically handled in most Western countries via professional self-regulation, licensing, and recertification systems, which are usually based on credit points attained via participation in specific educational activities. The impact of such systems, however, remains unclear, and there is virtually no information on the quality and effects of the educational systems themselves.⁴⁸ More formal systems of regular assessment and "revalidation" of physicians have been proposed in various countries but have yet to be implemented, at least in most countries.⁴⁹ Problems can be foreseen in this domain because of a lack of valid and reliable measures and the nature of the data to be used (see the next section). Also, a cultural change is basically needed among professionals; as the editor of the *BMJ* wrote, "medicine has a culture of hiding errors and forgiving those who make them . . . we need a cul-

ture that allows doctors to express fears, doubts and vulnerabilities."⁵⁰

In sum, there are indeed very interesting new educational approaches within the field of self-regulatory professional development, but we need further evaluations of their impact, cost, and possibilities for implementation. Linking them to the implementation of the best research evidence and to high-quality clinical guidelines on the one hand, and to systems for monitoring clinical performance on the other, may guarantee a better impact on patient care. In particular, it is a challenge to link systems for self-regulatory professional development with systems for external assessment and accountability and with systems that focus on the organization of care; it is also a challenge to evaluate the impact and feasibility of such integrated systems.

ASSESSMENT AND ACCOUNTABILITY

There is wide consensus on the need for regular assessment and monitoring of clinical performance for both professional development and quality improvement (see previous section); in addition, there is widespread agreement on the need for public accountability.^{3,51} Considerable optimism exists with regard to the measurability of the quality of care as well. In an impressive review of 48 MEDLINE articles, Schuster and colleagues⁵² demonstrated that it is possible to clearly describe many aspects of the quality of care (about 50%-70% of the patients in the United States were found to receive the recommended care). In most Western countries, we see recent progress in the development of performance indicators and criteria. Such an approach is clearly favored by payers and other authorities who want transparency and control and expect systematic data collection, feedback, and publication of data to improve the quality of care and also reduce health care costs. The assumption is that when health care practitioners are confronted with negative information regarding their performance relative to that of their peers and these results are presented openly for every-

one to see, the behavior of the practitioners will change. But is this assumption correct? Concerns regarding the reliability and validity of the indicators and the data currently being used have been raised in the medical literature along with questions about the effects of feedback based on such indicators and the effects of the public reporting of evaluation results. For instance, the selection of indicators and measurements is said to be often driven by what can be measured and provides "simplicity at the expense of meaning."^{53,54} Little information is usually collected at the individual patient or case level, which makes the validity of such measurements doubtful.⁵⁵⁻⁵⁸ A study of the measurement of diabetes showed, for instance, valid and reliable assessment of physician performance to simply be impossible because of too few cases per decision.⁵⁹ In a review article by Eddy,⁵⁶ it is observed that "today's measures tend to be blunt, expensive, incomplete and distorting. And unless great care is taken, they can be easily misunderstood." A further point of concern is the actual impact of assessment and feedback on physicians. We found 8 systematic reviews that analyzed large numbers of randomized controlled trials that consistently showed only mixed or moderate improvements in patient care.⁶⁰ The most effective forms of assessment and feedback are still unclear, but certain studies⁶¹ suggest that targeted feedback provided by a well-respected peer or opinion leader using clearly credible (eg, evidence-based) guidelines may be most effective, particularly when it is embedded in a comprehensive program of continuous monitoring and improvement.

Another concern is related to the publication of performance data in the form of report cards or physician profiles as a tool for external accountability. This has become a multimillion dollar industry in the United States⁶² and raised considerable debate in the 1990s.⁶³ A recent systematic review of the impact of such performance information (21 publications on 7 different systems) revealed only 1 controlled study. This study⁶² showed the consuming public to

frequently not use the information, not understand it, or simply not trust it. It did, however, influence the quality improvement activities within the institutes. Additional studies in the United States confirmed these findings.^{64,65} In an editorial in *JAMA*, Bindman⁶⁶ concludes that physician profiles bring considerable cost, may cause considerable frustration and resistance among physicians, and may even lead to a declining quality of care rather than improved care. In a recent inventory of systems of external assessment in the world (such as accreditation programs, Baldrige and European Foundation of Quality Management models, and International Standards Organization assessments), Shaw⁶⁷ found that governments, insurers, consumers, and professions almost everywhere in the Western world hurry to set up new schemes to ensure public accountability and transparency in health care. He concludes, "What do we know about the schemes' evidence base, the validity of their standards, the reliability of their assessments, or their ability to bring improvements for patients, staff, or the general population? In short, not much."

Reflecting on the current state of the art and debates about assessment and accountability, we may conclude that measurement systems are absolutely essential for improving clinical performance, but many challenges lie ahead of us. These can, for instance, be found in building bridges between evidence-based guidelines and systems for monitoring quality with valid (evidence-based) indicators. A challenge is to develop simple, valid, case-based process measures with sufficient clinical detail that can be easily integrated within the monitoring systems in practices and hospitals.^{68,69} Methods should be developed and evaluated to solve the tensions between self-regulatory professional development and revalidation on the one hand and programs for external assessment and accountability on the other. In some countries, such as France,⁷⁰ experiments are under way to solve such tensions, but their feasibility and effects have to be studied. An-

other important question is how to involve patients systematically in the assessment of quality and how to use their input in continuous quality improvement. This brings us to the approaches discussed below.

PATIENT EMPOWERMENT

Placing the patient at the center of the provision of care is yet another new and important approach to improving the quality of medical care. From an ethical perspective, patient autonomy is seen as a basic value and underlying premise for the provision of health care in itself. From a psychological perspective, greater patient involvement and greater patient control are assumed to lead to better adherence to treatment recommendations and thus to better health. From an epidemiologic perspective, patients are seen as rational beings who, after being informed of the relevant benefits and risks of treatment alternatives, can share in decision making. Different methods can be used to "empower" patients: satisfaction surveys; complaint procedures; communication training for professionals; needs assessment; interactive education; the provision of information on the Internet; consultation via e-mail; and the use of decision analysis, decision aids, and risk tables for "shared decision making. Very promising methods indeed, but research into their value is in its infancy. A systematic review by Grilli et al⁷¹ showed that educating people at risk through mass media programs (eg, vaccination programs and programs intended to reduce numbers of hysterectomies) can be effective. The use of instruments to collect data on patients' health care needs (eg, the needs of elderly patients or those with depression) can lead to better detection of health problems, but the results of studies that evaluate the impact of such measures on the processes and outcomes of care are still unclear.⁷² Studies that evaluate the impact of satisfaction surveys on the provision of care are virtually nonexistent or methodologically limited.⁷² Most of the research on improving the role of patients in their own care has been focused on patient-physician commu-

nication. Various reviews show patient-centeredness on the part of the physician to be related to greater patient satisfaction and better adherence to treatment or advice.⁷³ The involvement of patients in decision making has recently received considerable attention.⁷⁴ The conclusion of one review⁷⁵ was that, although most patients like to receive adequate information on their condition and the various treatment alternatives, many do not want to be involved in the decision making related to their medical care. Some patients are found to refuse any responsibility for the management of their illness, particularly when they are seriously ill. According to the authors of the review, in fact, the positive effects of involving patients in decision making related to their care have yet to be demonstrated. This conclusion is in line with the results of a systematic review of 17 trials that analyzed the impact of decision aids.⁷⁶ Decision aids improved the knowledge and involvement of the patients in decisions, but had little effect on satisfaction with the care and variable effects on the decisions actually made and the outcomes of the care. The potential role and impact of the Internet and teleconsultations in the future are even more unclear. Approximately 40% to 50% of the people accessing the Web are said to do so to find medical information.⁷⁷ This suggests that this medium can play a crucial role in educating the public and informing them of the optimal evidence-based options for care. The quality and accessibility of information for patients are nevertheless still variable, and research on the impact of such information on their care and on patient-physician communication is only starting.⁷⁸⁻⁸⁰

The new emancipation of the patient may also raise new problems in the relationship between physician and patient. There is now increasing concern about unrealistic patient autonomy and increased consumerism and the expectation that this may foster laissez-faire attitudes and loss of morale among professionals. We need a new conceptualization of patient-centered care; new

roles for both clinicians and patients in the provision of medical care should be explored and defined to establish a "dialogue-centered care" with clear rights and responsibilities for both parties.⁸¹ Although patient empowerment is a fascinating new approach to the improvement of medical care, many steps have to be taken before it can be used with maximum effectiveness. Methods should be developed with real input from patients and consumers. We need to identify which methods of involving patients should be used for which patients, with what problems, and at what point in time, and we need to explore their costs and feasibility. We also need to find effective ways to bridge the gap and ease the tensions between EBM and a patient-centered approach. This obviously constitutes a major challenge for the field of quality development and research.

TOTAL QUALITY MANAGEMENT

The last approach to be discussed herein, TQM and continuous quality improvement, has its roots in the management perspective on quality improvement. The emphasis is not on the performance of individual clinicians, but on the ongoing efforts to improve the whole health care organization: the efficient organization of the care processes, optimal teamwork, committed employees, a stable infrastructure, and a culture of quality within the hospital and practice.⁸²⁻⁸⁴ A crucial element is "to understand, design, and simplify the processes as seen through the eyes of the patients."⁸⁵ Systematic monitoring of clinical performance, the provision of feedback, and the conduct of concrete quality improvement projects in a cyclic process should help make the care processes more efficient and patient friendly. The assumption is that the establishment of the necessary structural and organizational conditions for change will clearly help to improve clinical performance: "Real improvements come from changing the systems, not changing within the systems."⁸⁶ The TQM approach has considerable influence in many Western countries and particu-

larly in Western hospitals. Many examples of successful improvement projects can be found in the literature. Recent considerations of the impact of TQM suggest, however, that the evidence for its effectiveness is still largely anecdotal.⁸⁷ There is as yet only 1 systematic review available, which includes 55 studies; 42 of these studies were actually performed in the same hospital, whereas only 3 had a controlled design.⁸⁸ The authors therefore concluded that there is as yet insufficient evidence for real hospital-wide impact of TQM on health care delivery. The impact observed for primary care is even more limited.^{89,90} The first experiments with the use of TQM in small office-based primary care practices in the United States, the United Kingdom, and the Netherlands indicated that both long-term and intensive external support by expert facilitators is required for successful change.⁹¹⁻⁹³ Opinion leaders within the field of TQM admit that the approach has yet to meet their expectations.^{87,94} Widespread implementation has not been achieved; support from the management in institutions is often lacking, and physicians are either skeptical or do not understand the approach because it was developed by managers and first applied to the organization and not to specific clinical problems. The costs of hospital-wide TQM and staff training outweigh the benefits.

As we reflect on our current knowledge about the value of TQM, the question remains: how to make TQM more effective and how to implement it more successfully within health care? Theoretically, the TQM approach is very attractive, particularly because care provision is not viewed as just the performance of single actions by physicians, but also as processes organized around patients and their problems, and because improving the quality of care is not seen as just single improvement actions by physicians, but also as an organization-wide change of the culture toward quality. Integration of different approaches is one of its characteristics. However, the current TQM approaches should be better adapted to the realities

of health care to be maximally effective. Links to other approaches (eg, professional development and external assessment) should be established. Physicians should be actively involved and occupy leadership roles, and the quality improvement activities should be related to their needs and to patient-related problems more directly.⁹⁵⁻⁹⁷ Multidisciplinary collaboration within small quality-improvement teams receiving specific training is another important element.⁹⁸ New TQM methods that meet these requirements have recently been introduced, such as business redesign and the breakthrough series. Preliminary evaluations of these methods show some fascinating results, but the real challenge is to study their effectiveness in light of their cost, the time demands on the professionals involved, and their applicability to daily medical practice.

BUILDING BRIDGES

Where are we now and how should we continue with improving medical care? Considerable progress has been made in the last decades. We have gained good experiences with some new and challenging approaches to quality improvement; our knowledge about effective improvement in patient care has grown. Nevertheless, we still face large problems (overuse, underuse, and misuse) in the quality of medical care. The current approaches to quality improvement have been, so far, only partly successful in tackling these problems. This article does not provide a systematic review of the impact of all the approaches to improving medical care; that would be impossible within the context of one article. Only a few were addressed herein; some other interesting ones, such as risk management, managed care, disease management, organizational development, and learning organizations were not, but the conclusions will probably be similar.

We can observe a body of knowledge in this field to be found in hundreds of well-designed studies and some dozens of systematic reviews on strategies to improve patient care. They show that we have sufficient information on the im-

pect of classic CME, audit and feedback, and reminder methods, but that we lack studies on the value of many interesting new strategies, such as portfolio learning, organizational development, TQM methods (eg, the breakthrough series), or patient-oriented improvement strategies. The different approaches presented in this article all claim to contribute to improved patient care, and they probably do. However, the evidence for their cost-effectiveness and feasibility is mixed or lacking. We particularly lack a good understanding of which approach is most appropriate for what type of improvement in what setting. We are just beginning to gain a good look inside the black box and at the determinants of successful performance change. We need not only more well-designed trials to explore this field, but also observational studies of existing change processes, evaluation of large-scale programs of quality improvement, meta-analyses of samples of improvement projects, in-depth qualitative studies on critical success factors, and economic analyses of the resources needed in effective quality improvement.⁹⁹ Specific well-funded, long-term research programs, which stimulate the collaboration among researchers in different institutes and countries, are required to make progress in this very complex field.

We can indeed observe from the literature that the problems related to the improvement of patient care are large and complex. Many different factors—professional, social, economical, and organizational—play a role.¹⁰⁰ It is, therefore, not realistic to expect that one approach can solve all these problems; we need them all. The overview of systematic reviews on change in clinical care (Table 2) included, for instance, 16 reviews with studies that investigated the effects of multifaceted strategies for quality improvement—strategies that combined different approaches and targeted different barriers to improving care. They are, in general, more effective than individual approaches. This finding is confirmed by a recent overview of 41 systematic reviews by Grimshaw et al.¹⁰¹ Solberg et al.^{102,103} report on a qualitative

study on factors that support the implementation of evidence-based guidelines. A mixture of professional and organizational factors (such as the presence of an infrastructure for quality and the involvement of clinical leaders and enthusiastic volunteers) is said to be crucial. “Give attention to many different factors and use multiple strategies” is the conclusion of this study and of many other reflections on effective change.^{32,36} They all point in the direction of the need for building bridges among the different approaches to quality improvement. There is a need for integrated methods and comprehensive programs that combine, for instance, evidence-based guidelines, clinical pathways, indicators for continuous assessment, and quality improvement projects embedded within a wider quality system of a hospital or practice. We can observe the development of such programs in some countries (eg, the clinical governance program in the United Kingdom, some disease management programs in the United States, accreditation and continuous quality improvement in France, guideline development and implementation integrated in the Netherlands, and new programs for professional development combining education, guidelines, assessment, and revalidation in some countries). However, we lack information on the impact of such complex interventions. Most quality improvement activities in the world are still largely a reflection of the specific beliefs of specific parties about the best way to improve patient care. Crossing borders among professional pride and self-regulation, external accountability, payer profit, organizational development, and pleasing and involving patients can help us overcome the obstacles to optimal medical care.

REFERENCES

1. Bodenheimer T. The American health care system: the movement for improved quality in health care. *N Engl J Med*. 1999;340:488-492.
2. Kassirer J. Hospitals, heal yourselves. *N Engl J Med*. 1999;340:309-310.
3. Chassin MR, Galvin RW. The urgent need to improve health care quality: National Institute of Medicine National Roundtable on Health Care Quality. *JAMA*. 1998;280:1000-1005.
4. Berwick DM. Developing and testing changes in delivery of care. *Ann Intern Med*. 1998;128:651-656.
5. Andrews LB, Stocking C, Krizek T, et al. An alternative strategy for studying adverse events in medical care. *Lancet*. 1997;349:309-313.
6. Smith R. The NHS: possibilities for the endgame: think more about reducing expectations. *BMJ*. 1999;318:209-210.
7. Blumenthal D. Quality of care: what is it? *N Engl J Med*. 1996;335:891-894.
8. Grol R, Wensing M, eds. *Implementatie: Effectieve Verandering in de Patiëntenzorg [Implementation: Effective Change in Patient Care]*. Maarsse, the Netherlands: Elsevier; 2001.
9. Cochrane Review on CD-ROM. Oxford, England: Cochrane Library, Update Software; 2000; issue 3.
10. Chassin M. Is health care ready for Six Sigma Quality? *Milbank Q*. 1998;76:565-591.
11. Guyatt G, Meade M, Jaschke R, Cook D, Haynes B. Practitioners of evidence-based care. *BMJ*. 2000;320:954-955.
12. Wyatt JC, Paterson-Brown S, Johanson R, Altman DG, Bradburn MJ, Frisk N. Randomised trial of educational visits to enhance the use of systematic reviews in 25 obstetric units. *BMJ*. 1998;317:1041-1046.
13. McColl A, Smith H, White P, Field J. General practitioners' perceptions of the route to evidence-based medicine: a questionnaire survey. *BMJ*. 1998;316:361-365.
14. Tomlin Z, Humphrey C, Rogers S. General practitioners' perceptions of effective health care. *BMJ*. 1999;318:1132-1135.
15. Brassey J, Elwyn G, Price C, Kinnersley P. Just in time information for clinicians: a questionnaire evaluation of the ATTRACT project. *BMJ*. 2001;322:529-530.
16. Woolf SH, Grol R, Hutchinson A, Eccles M, Grinnshaw J. Clinical guidelines, potential benefits, limitations, and harms of clinical guidelines. *BMJ*. 1999;318:527-530.
17. Grol R, Eccles M, Maisonneuve H, Woolf S. Developing clinical practice guidelines: the European experience. *Dis Manage Health Outcomes*. 1998;4:255-266.
18. Thompson R, McElroy H, Sudlow M. Guidelines on anticoagulant treatment in atrial fibrillation in Great Britain: variation in content and implications for treatment. *BMJ*. 1998;316:509-513.
19. Shaneyfelt T, Mayo-Smith MF, Rothwangl J. Are guidelines following guidelines? the methodological quality of clinical practice guidelines in the peer-reviewed medical literature. *JAMA*. 1999;281:1900-1905.
20. Grilli R, Magrini N, Penna A, Mura G, Liberati A. Practice guidelines developed by specialty societies: the need for a critical appraisal. *Lancet*. 2000;355:103-106.
21. Ollenschläger G. Clinical practice guidelines in Germany: the German Guidelines Clearing House [Internet electronic letter]. *BMJ* [serial online]. February 20, 1999. Available at: <http://www.bmj.com>. Accessibility verified October 30, 2001.
22. Grant J, Cottrell R, Cluzeau F, Fawcett G. Evaluating “payback” on biomedical research from papers cited in clinical guidelines: applied bibliometric study. *BMJ*. 2000;320:1107-11011.
23. Naylor CD. Grey zones of clinical practice: some limits to evidence-based medicine. *Lancet*. 1995;345:840-842.
24. Starfield B. Quality of care research: internal elegance and external relevance. *JAMA*. 1998;280:1006-1008.
25. Van Weel C, Knottnerus JA. Evidence-based interventions and comprehensive treatment. *Lancet*. 1999;353:916-918.
26. Howitt A, Armstrong D. Implementing evidence based medicine in general practice: audit and qualitative study of antithrombotic treatment for atrial fibrillation. *BMJ*. 1999;318:1324-1327.
27. Norheim OF. Healthcare rationing: are additional criteria needed for assessing evidence based clinical practice guidelines? *BMJ*. 1999;319:1426-1429.

28. Haycox A, Bagust A, Walley T. Clinical guidelines: the hidden costs. *BMJ*. 1999;318:391-393.
29. Fahey TP, Peters TJ. What constitutes controlled hypertension? patient based comparison of hypertension guidelines. *BMJ*. 1996;313:93-96.
30. Eisinger F, Geller G, Burke W, Holtzman NA. Cultural basis for differences between US and French clinical recommendations for women at increased risk of breast and ovarian cancer. *Lancet*. 1999;353:919-920.
31. Bero L, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ*. 1998;317:465-468.
32. Grol R, Grimshaw J. Evidence-based implementation of evidence-based medicine. *Jt Comm J Qual Improv*. 1999;25:503-513.
33. Grimshaw JM, Russel IT. Effects of guidelines on medical practice: a systematic review of rigorous evaluations. *Lancet*. 1993;342:1317-1322.
34. Hunt DL, Haynes RB, Hanna SE, Smith K. Effects of computer-based clinical decision support systems on physician performance and patient outcomes: a systematic review. *JAMA*. 1998;280:1339-1346.
35. The AGREE Collaboration. AGREE Instrument. Available at: <http://www.agreecollaboration.org>. Accessibility verified October 30, 2001.
36. Grol R. Beliefs and evidence in changing clinical practice. *BMJ*. 1997;315:418-421.
37. Tonelli MR. The philosophical limits of evidence-based medicine. *Acad Med*. 1998;73:1234-1240.
38. Davis DA, Thomson MA, Oxman AD, Haynes RB. Changing physician performance: a systematic review of the effect of continuing medical education strategies. *JAMA*. 1995;274:700-705.
39. Davis D, O'Brien MA, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Do conferences, workshops, rounds and other traditional continuing education activities change physician behavior or health outcomes? *JAMA*. 1999;282:867-874.
40. Oxman AD, Thomson MA, Davis DA, Haynes RB. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. *CMAJ*. 1995;153:1423-1431.
41. Buckley G. Revalidation is the answer. *BMJ*. 1999;319:1145-1146.
42. Peck C, McCall M, McLaren B, Rotem T. Continuing medical education and continuing professional development: international comparisons. *BMJ*. 2000;320:432-435.
43. Thomson M, O'Brien MA, Oxman AD, et al. Educational outreach visits: effects on professional practice and health care outcomes [Cochrane Review on CD-ROM]. Oxford, England: Cochrane Library, Update Software; 1999; issue 4.
44. Wensing M, Weijden van der T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? *Br J Gen Pract*. 1998;48:991-997.
45. Grant J, Stanton F. *The Effectiveness of Continuing Professional Development*. London, England: Joint Centre for Education in Medicine; 1998:21-24.
46. Finucane PM, Johnson SM, Pridoux DJ. Problem-based learning: its rationale and efficacy. *Med J Aust*. 1998;168:445-448.
47. Hutchinson L. Evaluating and researching the effectiveness of educational interventions. *BMJ*. 1999;318:1267-1269.
48. Campbell J, Johnson C. Trend spotting: fashions in medical education. *BMJ*. 1999;318:1272-1275.
49. DuBoulay C. From CME to CPD: getting better at getting better? *BMJ*. 2000;320:393-394.
50. Smith R. Managing the clinical performance of doctors. *BMJ*. 1999;319:1314-1315.
51. Brook R, McGlynn EA, Cleary PD. Measuring quality of care. *N Engl J Med*. 1996;335:966-970.
52. Schuster M, McGlynn E, Brook R. How good is the quality of health care in the United States? *Milbank Q*. 1998;76:517-563.
53. McKee M, Sheldon T. Measuring performance in the NHS. *BMJ*. 1998;316:322.
54. Casalino L. The unintended consequences of measuring quality on the quality of medical care. *N Engl J Med*. 1999;341:1147-1150.
55. Shekelle PG, Roland M. Measuring quality in the NHS: lessons from across the Atlantic. *Lancet*. 1998;352:163-164.
56. Eddy D. Performance measurement: problems and solutions. *Health Aff (Millwood)*. 1998;17:7-25.
57. Ellrodt AG, Conner L, Riedinger M, Weingarten S. Measuring and improving physician compliance with clinical practice guidelines: a controlled intervention trial. *Ann Intern Med*. 1995;122:277-282.
58. McColl A, Roderick P, Gabbay J, Smith H, Moore M. Performance indicators for primary care groups: an evidence based approach. *BMJ*. 1998;317:1354-1360.
59. Hofer TP, Hayward RA, Greenfield S, Wagner EH, Kaplan SH, Manning WG. The unreliability of individual physician "report cards" for assessing the costs and quality of care of a chronic disease. *JAMA*. 1999;281:2098-2105.
60. Thomson M, Oxman A, Davis D, et al. Audit and feedback to improve health professional practice and health care outcomes [Cochrane Review on CD-ROM]. Oxford, England: Cochrane Library, Update Software; 1999; issue 1.
61. Winkens RA, Pop P, Grol RP, et al. Effect of routine individual feedback over nine years on general practitioners' requests for tests. *BMJ*. 1996;312:490.
62. Marshall MN, Shekelle PG, Leatherman S, Brook RH. The public release of performance data: what do we expect to gain? a review of the evidence. *JAMA*. 2000;283:1866-1874.
63. Kassirer J. The use and abuse of practice profiles. *N Engl J Med*. 1994;330:634-636.
64. Schneider E, Lieberman T. Publicity disclosed information about the quality of health care: response of the US public. *Qual Health Care*. 2001;10:96-103.
65. Davies H. Public release of performance data and quality improvement: internal responses to external data by US health care providers. *Qual Health Care*. 2001;10:104-110.
66. Bindman A. Can physician profiles be trusted? *JAMA*. 1999;281:2142-2143.
67. Shaw C. External assessment of health care. *BMJ*. 2001;322:851-854.
68. Brook R, McGlynn E, Shekelle P. Defining and measuring quality of care: a perspective from US researchers. *Int J Qual Health Care*. 2000;12:281-296.
69. Nelson EC, Splaine ME, Batalden PB, Plume SK. Building measurement and data collection into medical practice. *Ann Intern Med*. 1998;128:460-466.
70. Giraud A. Accreditation and the quality movement in France. *Qual Health Care*. 2001;10:111-116.
71. Grilli R, Freemantle N, Minozzi S, Domenighetti G, Finer D. Impact of mass media on health services utilisation [Cochrane Review on CD-ROM]. Oxford, England: Cochrane Library, Update Software; 1998; issue 3.
72. Wensing M. Patients' views on health care: a driving force for improvement in disease management. *Dis Manage Health Outcomes*. 2000;3:117-125.
73. Stewart MA. Effective physician-patient communication and health outcomes: a review. *CMAJ*. 1995;152:1423-1433.
74. Edwards A, Elwyn G, eds. *Evidence-Based Patient Choice: Inevitable or Impossible?* Oxford, England: Oxford University Press; 2001.
75. Guadagnoli E, Ward P. Patient participation in decision making. *Soc Sci Med*. 1998;47:329-399.
76. O'Connor AM, Rostom A, Fiset V, et al. Decision aids for patients facing health treatment or screening decisions: systematic review. *BMJ*. 1999;319:731-734.
77. Ferguson T. Digital doctoring—opportunities and challenges in electronic patient-physician communications. *JAMA*. 1998;280:1361-1362.
78. Hersh W. "A world of knowledge at your fingertips": the promise, reality, and future direction of on-line information retrieval. *Acad Med*. 1999;74:240-243.
79. Jadad AR, Gagliardi A. Rating health information on the Internet: navigation to knowledge or to Babel? *JAMA*. 1998;279:611-614.
80. Mair F, Whitten P. Systematic reviews of studies of patient satisfaction with telemedicine. *BMJ*. 2000;320:1517-1520.
81. Jung HP. Quality of Care in General Practice: the Patient Perspective [dissertation]. Nijmegen, The Netherlands: Nijmegen University; 1999.
82. Laffel G, Blumenthal D. The case for using industrial quality management science in health care organizations. *JAMA*. 1989;262:2869-2873.
83. Berwick DM. Continuous improvement as an ideal in health care. *N Engl J Med*. 1989;320:53-56.
84. Berwick DM. Developing and testing changes in delivery of care. *Ann Intern Med*. 1998;128:651-656.
85. Kenagy JW, Berwick DM, Shore MF. Service quality in health care. *JAMA*. 1999;281:661-665.
86. Berwick DM. A primer on leading the improvement of systems. *BMJ*. 1996;312:619-622.
87. Blumenthal D, Kilo C. A report card on continuous quality improvement. *Milbank Q*. 1998;76:593-624.
88. Shortell S, Bennet C, Byck G. Assessing the impact of continuous quality improvement on clinical practice: what it will take to accelerate progress. *Milbank Q*. 1998;76:593-624.
89. Goldberg R, Wagner E, Fihn S, et al. A randomised controlled trial of CQI teams and academic detailing: can they alter compliance with guidelines? *Jt Comm J Qual Improv*. 1998;24:130-142.
90. Solberg L, Kottke T, Brekke M, et al. Failure of a continuous quality improvement intervention to increase the delivery of preventive services: a randomized trial. *Effect Clin Pract*. 2000;3:105-115.
91. Lawrence M, Packwood T. Adapting total quality management for general practice: evaluation of a programme. *Qual Health Care*. 1996;5:151-158.
92. Geboers H, Grol R, Van den Bosch W, et al. A model for continuous quality improvement in small scale practices. *Qual Health Care*. 1999;8:36-42.
93. Solberg LI, Brekke ML, Kottke TE, Steel RP. Continuous quality improvement in primary care: what's happening? *Med Care*. 1998;36:625-635.
94. Batalden P, Stoltz P. Quality management and continual improvement of health care: a framework. *J Contin Educ Health Prof*. 1995;15:146-164.
95. Ovetveit J. Medical participation in and leadership of quality programmes. *J Manage Med*. 1996;10:21-28.
96. Berwick DM, Nolan TW. Physicians as leaders in improving health care. *Ann Intern Med*. 1998;128:289-292.
97. Weiner BJ, Shortell SM, Alexander J. Promoting clinical involvement in hospital quality improvement efforts: the effects of top management, board, and physician leadership. *Health Serv Res*. 1997;32:491-510.
98. Clemm TP, Spuhler VJ, Berwick DM, Nolan TW. Cooperation: the foundation of improvement. *Ann Intern Med*. 1998;128:1004-1009.
99. Campbell M, Fitzpatrick R, Haines A, et al. Framework for design and evaluation of complex interventions to improve health. *BMJ*. 2000;321:694-696.
100. Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? *JAMA*. 1999;282:1458-1465.
101. Grimshaw JM, Shirran L, Thomas R, et al. Changing provider behavior: an overview of systematic reviews of interventions. *Med Care*. 2001;39:112-45.
102. Solberg L, Brekke M, Fasio J, et al. Lessons from experienced guideline implementers: attend to many factors and use multiple strategies. *Jt Comm J Qual Improv*. 2000;26:171-188.
103. Solberg L. Guideline implementations: what the literature doesn't tell us. *Jt Comm J Qual Improv*. 2000;26:525-537.