Evidence-based guidelines hold considerable promise for continued improvement of health-care delivery. However, the availability of clinical practice guidelines does not automatically lead to changes in practice patterns. Using a “push-pull-capacity” model, this article describes strategies to improve guideline implementation for three types of organizations: national organizations, insurer and health-care organizations, and health-care purchasers. Push strategies focus on the guideline development process and include rigorous review and meta-analysis of peer-reviewed research, and use of multidisciplinary expert teams, subjecting guidelines to peer review and comment and using measurable clinical outcomes to define guidelines. Pull strategies focus on creating a demand for guideline implementation and include professional organization endorsement, quality measures based on guideline-related outcomes, and guideline-based performance objectives in purchaser contracts and physician compensation agreements. Capacity strategies focus on systems that facilitate guideline implementation. Example strategies are providing benefit coverage and reimbursement for guideline-based treatment protocols, and implementing clinical information systems for population-based tracking, outcomes monitoring, and benchmarking feedback.

Key words: clinical practice guidelines; health-care delivery; quality improvement

Abbreviations: AHRQ = Agency for Health Research and Quality; ATMC = Addressing Tobacco in Managed Care; EBG = evidence-based guideline; HEDIS = Health Plan Employer Data and Information Set; MCO = managed-care organizations; NCQA = National Committee on Quality Assurance; USPSTF = United States Preventative Services Task Force

Evidence-based guidelines (EBGs) hold considerable promise for continued improvement of health-care delivery. When developed from a rigorous review and evaluation of available research, EBGs provide an important bridge between research and practice. As defined by the Agency for Health Research and Quality (AHRQ), “guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical conditions.”1 Succinct and credible practice guidelines can reduce the burden on individual practitioners to synthesize and organize evidence-based knowledge across a wide range of medical conditions. EBGs can help to define the roles and responsibilities of all practice-team members more clearly, resulting in greater efficiency and higher quality of care.

The research literature on the development and implementation of EBGs has grown considerably over the past several years, and provides evidence that clinical guidelines can lead to modest improvements in clinical practice, preventive practice, and prescribing of laboratory tests.2 Unfortunately, research also shows that the availability of clinical practice guidelines does not automatically lead to changes in practice patterns. This article focuses on organizational strategies that can contribute to enhanced compliance with clinical practice guidelines. The article begins with an overview of some heuristic frameworks for identifying organizational opportunities to improve guideline implementation. We discuss intervention approaches for three types of organizations: national organizations, insurer and health-care organizations, and health-care purchasers. Approaches to encouraging the implementation of the Smoking Cessation Clinical Practice Guideline of the AHRQ provide specific examples of successful strategies.

**Heuristic Frameworks**

Because clinical practice guidelines are developed to guide the practice of individual clinicians, it can be tempting to focus accountability for the success or failure of guideline implementation on physicians. However, effective guideline implementation strate-
gies involve multiple levels. As illustrated in Figure 1, the synergy of strategies and resources at the patient, provider, and organizational levels is important. Patients can undermine their physicians’ ability to implement practice guidelines if they lack confidence in the credibility of the practice guideline, if it is too complex for them to understand, and if they are unable or unwilling to access the treatments that are recommended in the guideline. In addition, providers will fail to implement guidelines that they do not find credible, that are too complex, that require clinical systems or other resources that they do not have access to, and that are radically different from the prevailing treatment norms in their medical community. Clearly, organization-level strategies can address many of these barriers. These strategies can include the rigor of the evidence review conducted by organizations that create practice guidelines, the benefit and reimbursement policies for patients and providers, and investment in clinical information systems.

The synergy among these levels is well summarized in a “push-pull-capacity” model described by Anderson and colleagues. As illustrated in Figure 2, there must be a science and technology push that creates sufficient evidence for credible guidelines to be developed, a market pull or demand from patients (for state-of-the-art treatments), providers (for engaging in best practices), or organizations (for enhancing efficiency, controlling costs, and improving health outcomes), and delivery capacity in the organization that includes the development of organizational systems for guideline implementation.

Building systems for guideline implementation is essentially a process of organizational innovation. Work by Somnad provides a useful framework that outlines key organizational factors by four stages of innovation to recommend specific organizational strategies that facilitate successful guideline implementation. The model proposes five challenges inherent in organizational change. First, there is a continuum of motivators for organizations to adopt practice guidelines from voluntary to regulatory. Guidelines may be implemented because of state and/or federal requirements; they may be adopted voluntarily out of a desire to adopt new practice norms, improve efficiency, or enhance the image of a health-care organization. Second, practice guidelines goals need to be linked to the strategic plan of the organization. Third, considerable uncertainty and controversy can emerge when there is a lack of connection between the developers and users of practice guidelines. Fourth, organizations need explicit implementation steps that are specific to their structures and cultures. Finally, organizations need specific measures to track implementation of the innovation. Clearly, these challenges will take time to address and implementation should proceed in a deliberate and thoughtful way. Somnad proposes four stages of innovation that suggest specific tactics for tackling each of these challenges: (1) making guideline adoption an organizational priority, and generating ideas for how to implement it; (2) bringing the right people and resources to the table to align the guideline with the overall strategic plan of the organization; (3) defining specific measurable

Figure 1. Multilevel strategies for guideline implementation.
outcomes (goals) for the guideline; and (4) assimilating the guideline through ongoing monitoring that is part of the organization’s existing financial and/or quality assurance operations.

**Organizational Interventions**

Three major organizational structures contribute to the pull-push-capacity needed for successful development, implementation, and assimilation of evidence-based practice guidelines. These include national organizations, such as professional associations, federal agencies devoted to health care, and regulatory or accreditation bodies; health-care organizations, which can be nationwide; and purchaser groups, which can form regional coalitions.

**National Organization Strategies**

The likelihood of successful adoption and implementation of an EBG begins with the organization that is developing the guideline. Federal agencies (e.g., AHRQ, United States Preventative Services Task Force [USPSTF]) and professional organizations both develop EBGs. The guideline development literature offers clear and practical advice in several areas. Of paramount importance is the quality of the evidence. Most guidelines emerge from a synthesis of evidence from large-scale randomized trials, observational studies, and expert opinion. Guidelines released by professional societies that are viewed as having a vested interest in promoting a specific treatment protocol that is not well supported by published data are less likely to motivate organizational adoption. However, guidelines with a strong evidence base that is accessible to organizations (e.g., the guideline includes a detailed bibliography) hold more promise. Elegant but complicated guideline algorithms can also be problematic. Developers should aim for the simplest guideline, preferably with an algorithm that could fit on a pocket-sized card. Congruence with prevailing practice is another important consideration. If guideline recommendations radically depart from usual patterns of care, they need very high-quality evidence and, even then, adoption of the practice guideline could require considerable efforts to change practice norms. Finally, the goals of the guideline should be explicit and measurable. This will increase the likelihood of pull from other organizations (e.g., accreditation/regulatory organizations, health-care purchasers) by incorporating the desired clinical outcomes into the accountabilities of the health-care organization.

In addition to establishing EBGs, professional organizations can influence adoption of guidelines in several ways. First, organizations enhance the credibility of guidelines by publicly endorsing them, and by working to change practice norms to align with new guidelines. In addition, such organizations can help to set and implement the research agenda for further refinement and evaluation of the impact of guidelines.

There is a synergistic relationship between the availability of EBGs and the requirements of agencies that provide accreditation and “report cards” for
health-care organizations (eg, the National Commit-
tee on Quality Assurance [NCQA]). Accrediting
organizations often look to EBGs in determining
which clinical outcomes to include as benchmarks
for assessing quality of care. Likewise, regulatory and
quality-rating requirements strongly influence the
clinical priorities of health-care organizations. For
example, the current Health Plan Employer Data
and Information Set (HEDIS) of the NCQA draws
on USPSTF guidelines for prevention measures.10 In
turn, many managed-care organizations (MCOs)
have accelerated work in adoption and compliance
with USPSTF guidelines in response to the HEDIS
measures.

**Insurer/Health-Care Organization Strategies**

With increased penetration of various managed-
care models in health-care delivery, the vast majority
of physicians practice in a larger organizational con-
text. Health-care organizations and insurers encour-
age guideline implementation through their benefit
structures, the administrative and technological re-
sources they make available to practices, and the
accountabilities they establish for physicians.

Insurers and MCOs influence the likelihood that
patients will receive the treatments recommended
by EBGs. They determine whether and how much
their benefit structures cover the recommended treat-
ments.11 There is substantial literature that shows lower
use of preventive and other health-care services
among patients who have no coverage or reduced
coverage (ie, copayments) for those services.12–14
Physicians are also less likely to implement treatment
guidelines if the time and services required are not
reimbursed. Of course, not all treatment guidelines
involve complicated and time-consuming patient-
provider interactions or separate treatments. It is
helpful for guideline developers to distinguish be-
 tween aspects of a guideline that should be consid-
ered part of routine medical care (eg, assessing
smoking status as a vital sign) that would not be
separately reimbursed, and additional treatment pro-
 tocols for which providers should be compensated
(eg, smoking cessation counseling visits).15

EBGs encourage systematic and consistent medi-
cal practice. Achievement of this goal extends be-
 yond the patient-provider interaction. Effective
guidelines provide defined roles for all practice-team
members (eg, clinic receptionists, medical assistants,
nurses, and other allied health professionals). Health-
care organizations can provide several important
resources to ensure that these roles are fulfilled. First,
they can provide relevant training, preferably
through an academic detailing model.16,17 Trainers
could be local experts or guideline champions who
are compensated as part of their practice. Second,
the practice team will need clinical information and
tracking systems that allow for population-based
application of the guideline.9,18 These information
and tracking systems can also be used to provide
practice-specific as well as comparative-normative
feedback, which has been demonstrated to enhance
guideline adherence.19

Perhaps one of the most potent strategies for
enhancing guideline adherence is incorporating
guideline-related outcomes as performance account-
abilities for physician evaluation and compensa-
tion.20 This could be easily integrated by health-care
organizations that track outcomes as part of their
overall quality assurance strategy and that participate
in reporting systems such as HEDIS.

**Purchaser Strategies**

Employers are the largest purchasers of health
care in the United States, and their influence on
health care has grown substantially over the past
decade.21,22 Purchasers have implemented a number
of strategies in their efforts to contain rising health-
care premium costs. These include limiting health-
care choices to MCOs, requiring employees to share
health-care premium costs, direct contracting be-
tween employer coalitions and health-care provider
systems, and implementing self-insurance plans.21,22
As part of these efforts, health-care purchasers can
influence the types of health-care services that are
covered, and the degree to which health-care pro-
viders achieve certain outcomes.

Purchasers often look to published guidelines to
inform their negotiations with health-care organiza-
tions over benefit packages.23 In turn, health-care
organizations can use their commitment to cover
EBG services as a means of encouraging employees
to select their plans. In some areas, groups of
employers have formed purchasing collectives or
coalitions whose organizational strategies can also
encourage guideline implementation. Through
agreements on uniform benefit structures and col-
lective negotiation of health-care premiums, pur-
 chaser coalitions facilitate a model of “managed
competition,” where health-care organizations and
insurers compete not only on the basis of price, but
also on the basis of quality.23 Quality measures
 include patient satisfaction ratings and specific out-
come targets. By placing a small percentage of
the negotiated health premiums at risk, these outcome
targets become performance guarantees. These out-
comes can be based on EBG recommendations.

The Pacific Business Group on Health has been a
pioneer in this area. Beginning in 1996, they nego-
tiated over two dozen performance guarantees with
13 of the largest MCOs in California. Many of the quality-of-care targets were derived either from published guidelines (eg, USPSTF prevention guidelines) or report card measures (eg, HEDIS) in areas such as immunization, mammography screening, and prenatal care. In 1996, the performance guarantees placed >$10 million (approximately 2% of total premiums) at risk, of which nearly $2 million (23%) was refunded by health maintenance organizations that missed their targets.24

**CASE EXAMPLE: AHRQ CLINICAL PRACTICE GUIDELINE ON SMOKING CESSATION**

The AHRQ Clinical Practice Guideline on Smoking Cessation was published in April 1996, following 2 years of work by a distinguished panel of smoking cessation experts.1 In addition to the goal of identifying which smoking cessation treatments had quality data supporting their effectiveness, the guideline panel defined a second goal of recommending strategies to institutionalize effective treatments. The guideline panel accomplished the first goal by conducting >50 meta-analyses of smoking cessation treatment studies published since the mid-1970s. The emerging recommendations received nationwide peer review prior to their publication.1

**Inclusion of a “Systems Approach” Component in the Guideline**

In addition to publishing the full guideline, the AHRQ implemented an innovative strategy by publishing a series of additional documents. The target audiences for these documents included patients, primary-care physicians, specialists, and insurers and MCOs. The document for insurers and MCOs included six recommendations for health-care administrators, purchasers, and insurers that are designed to facilitate the implementation and assimilation of the guideline. As summarized in Table 1, these recommendations encompass practice-level resources, benefit policies, and performance accountabilities.

**Table 1—AHRQ Guideline Recommendations for Health Care Administrators, Purchasers, and Insurers**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Implement a tobacco-user identification system in every clinic.</td>
<td></td>
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<tr>
<td>Provide education, resources, and feedback to promote provider intervention.</td>
<td></td>
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<tr>
<td>Promote hospital policies that support and provide smoking cessation services.</td>
<td></td>
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<tr>
<td>Include smoking cessation treatments as paid services in all health benefits packages.</td>
<td></td>
</tr>
<tr>
<td>Address effective smoking cessation treatment in clinician compensation agreements.</td>
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</table>

**Addition of Smoking Cessation Advice to HEDIS Measures**

The release of the smoking cessation guideline of the AHRQ was an important catalyst for the addition of smoking-related measures in the 1997 HEDIS 3.0. HEDIS 3.0 included smoking cessation advice (the percentage of adult current smokers who received advice to quit smoking from a plan provider during the previous year) as part of the reporting set, as well as two measures for the “testing” set (prevalence of current smokers and prevalence of quitting). During the first year of reporting, the aggregate result was 61% of smokers received advice to quit from a health-plan provider (range across plans that reported data, 30 to 85%). In 1997, the aggregate rate was 64%; in 1998, it fell to 62.5%. However, the measure changed between 1997 and 1998. The 3-year average among organizations that reported in 1996 through 1998 was 66%. While it is encouraging that a majority of providers appear to be implementing a key component of the AHRQ guideline, there is still room for improvement. The 90th percentile benchmark of the NCQA is 74.3%.

**The Addressing Tobacco in Managed Care Program of the Robert Wood Johnson Foundation**

In 1998, inspired by the release of the smoking cessation guideline by the AHRQ, and the volume of interest among MCOs in evaluating system-level innovations to facilitate implementation of the guideline, the Robert Wood Johnson Foundation launched the Addressing Tobacco in Managed Care (ATMC) program as a national initiative.25 This two-part program includes a technical assistance office and a grants program. The technical assistance office, under the direction of the American Association of Health Plans in partnership with Health Alliance Plan and Prudential Center for Health Care Research, provides technical assistance to health plans that wish to develop tobacco cessation programming; conducts a benchmarking awards program to highlight exemplary initiatives by health plans in tobacco cessation; conducts a biannual survey of health plans to determine practices related to the AHRQ smoking cessation guideline; and promotes best practices through training workshops and national and regional conferences. The national program office of the ATMC grant program is based at the University of Wisconsin in partnership with the Center for Health Studies at Group Health Cooperative. ATMC grants support the evaluation of organizational policies and practices that lead health-care providers, practices, and plans to adopt and adhere to the recommendations of the AHRQ Smoking...
Cessation Clinical Practice Guideline. Currently, the program funds 11 12-month planning grants and 4 2- to 3-year evaluation grants. The projects funded under this initiative examine the impact of organizational strategies (including clinical, financial, and administrative practices) on such outcomes as smoker identification, tobacco use reduction among patients, rates of clinician intervention, and costs of intervention efforts. This program of research spans the full spectrum of MCO models so that results may benefit a wide range of providers and health plans.

**Recommendations**

Professional organizations, organizations committed to oversight of health-care quality, large purchasers of health care, insurers, and MCOs can significantly impact the implementation of EBGs. The push-pull-capacity framework offers several recommendations to increase the adoption, reach, and impact of EBGs.

**Guideline Development (Push)**

- Base guidelines on rigorous reviews and meta-analyses of peer-reviewed research.
- Use a multidisciplinary team of experts to develop the guidelines.
- Subject guidelines to peer review and comment prior to dissemination.
- Define guideline goals in terms of measurable clinical outcomes.

**Demand for Guideline Implementation (Pull)**

- Professional organizations endorse rigorous EBGs and promote practice norms that are consistent with guideline protocols.
- Base national report card quality measures on guideline-related outcomes.
- Include guideline-based performance objectives and performance guarantees as part of health-care premium negotiations.
- Include guideline-based performance objectives in physician compensation agreements.

**Systems To Facilitate Guideline Implementation (Capacity)**

- Provide benefit coverage (for patients) and/or reimbursement (for physicians) for guideline-based treatment protocols.
- Implement clinical information systems that allow for the following: (1) population-based tracking of patient populations; (2) monitoring of outcomes to assess progress in guideline implementation; and (3) benchmarking feedback to physicians.

**References**

10. Davis RM. An overview of tobacco measures. Tob Control 1998; 7:S36–S40
15. Schaufele HH. Defining benefits and payment for smoking cessation treatments. Tob Control 1998; 7:S81–S85
the initial care of health care workers exposed to body fluids. JAMA 1997; 278:1585–1590


