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The Role of Health Care Systems in Increased Tobacco Cessation

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smoking, health care delivery, audit and feedback, health care financing, costs of tobacco

Abstract

Health care delivery systems are critical components of tobacco cessation efforts. This review summarizes recent evidence in support of the health care system recommendations in the 2000 U.S. Public Health Service Clinical Practice Guideline, *Treating Tobacco Use and Dependence*. Measurable progress in addressing tobacco use through the health care system is summarized, including accountabilities for addressing tobacco in national health care reporting systems, increases in reported advice to quit smoking from health care providers, and wider availability of insurance coverage for tobacco cessation treatments. Despite progress, significant gaps remain between what is possible and what is done by health care systems to impact tobacco cessation. A four-point public policy agenda is outlined to help close these gaps.

INTRODUCTION

The imperative to increase tobacco cessation is evident in the devastating toll of tobacco use in the United States. Each year more than 400,000 people die prematurely owing to tobacco use; an additional 50,000 lives are lost from second-hand smoke exposure. Additionally, more than 8.6 million people in the United States currently suffer from smoking-caused illnesses (11).

In addition to the overwhelming human costs, the annual financial costs related to tobacco use are staggering. Total annual public and private health care expenditures caused by smoking amount to \$96.7 billion, excluding the \$4.98 billion in annual health care expenditures resulting from second-hand smoke. Costs associated with lost productivity due to tobacco use exceed \$97 billion. Smoking-caused health costs and productivity losses are conservatively estimated at \$10.28 per package of cigarettes sold in the United States (11).

Reducing the health and economic costs from tobacco use requires a comprehensive approach to tobacco control. Complete coverage of this topic is beyond the scope of this review. Here we focus specifically on the role of health care systems in increasing tobacco cessation. The potential of tobacco cessation is enormous. Estimates are that deaths from tobacco-related diseases can be halved over the next 50 years through concerted efforts to increase cessation among current smokers (84). By reducing the prevalence of cancer risk factors, Byers and colleagues estimated achievable reductions of 19% in cancer incidence and 29% in cancer mortality in the United States by 2015. Notably, 47% of the achievable reductions in cancer incidence and 51% of achievable reductions in cancer mortality would come from tobacco use cessation (10). A similar analysis for coronary disease mortality, conducted in the United Kingdom, indicates that tobacco use cessation would result in a 44% reduction in mortality (19).

Smoking cessation offers the potential to reduce future health care costs. Because poor

health is a strong motivator for smoking cessation, several studies show that health care costs and utilization for former smokers are higher than those for continuing smokers at the time of cessation (35, 36, 90). However, these studies also find that former smokers, despite being in poorer health, have reduced health costs in comparison to continuing smokers within a five- to six-year period post cessation. Moreover, quitters without chronic conditions have health care costs comparable to never smokers' within five years of quitting. Quitters with chronic conditions have health care costs comparable to never smokers' within 10 years (72).

Effective behavioral and pharmacological treatments are available. A course of tobacco-dependence treatment that involves at least four counseling sessions and the use of a Food and Drug Administration–approved pharmacotherapy can achieve 12-month abstinence rates of 25%–30% (32). Because failure to quit smoking following treatment does not preclude future success with the same treatment, cumulative cessation rates can be significantly higher (85). These outcomes compare favorably to success rates for management of other chronic conditions. Estimates are that only 27% of hypertensive individuals achieve targeted systolic and diastolic blood pressure (13). A longitudinal study of the effectiveness of targeted diabetes care in primary care practice found that only 40% of patients achieved reductions in hemoglobin A1C after three years of treatment (44).

Tobacco-dependence treatment is far more cost-effective than many standard medical treatments. Estimates of the cost-effectiveness of tobacco dependence treatment range from \$883 to \$3590 per year of life saved (23, 54, 85, 86). This is a fraction of the annual cost for treating mild hypertension (\$11,300) or hypercholesterolemia (\$65,511), and well below the conventional benchmark for cost-effectiveness of \$50,000 per year of life saved (28).

Tobacco cessation is a major national health priority. *Healthy People 2010* includes

27 objectives related to tobacco use, including the goal of reducing adult tobacco use from 24% in 1998 to 12% by 2010 (87). In the wake of the Institute of Medicine's landmark report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, the Institute of Medicine selected treatment of tobacco use and dependence as one of 20 priorities for national health care quality improvement (52). In its most recent assessment, the National Commission on Prevention Priorities identified tobacco use screening and cessation intervention as the single highest-priority clinical preventive service for adults in the general population (64, 65). The commission estimates that closing existing gaps in the delivery of tobacco use screening and intervention as part of routine health care delivery could save as many quality-adjusted life-years as closing existing gaps in the delivery of all other 11 adult clinical preventive services recommended by the U.S. Preventive Services Task Force combined (64, 85). The 2007 Institute of Medicine Report *Ending the Tobacco Problem: A Blueprint for the Nation* evaluated numerous policy strategies to address tobacco use and also concluded that cessation interventions have the potential to significantly reduce tobacco use prevalence over time (51).

Health care delivery systems are a critical component of tobacco cessation efforts (67). An estimated 70% of the 45 million adult smokers in the United States see a health care provider each year, representing over 31 million opportunities for brief intervention and treatment (25). A Cochrane Collaboration meta-analysis of randomized trials concluded that brief advice to quit from a health care provider significantly increases cessation rates (59). There is also evidence from national surveys that advice from a health care provider increases the use of evidence-based tobacco cessation treatments, particularly among groups of smokers with very low rates of treatment use. An analysis of data from the 2000 National Health Interview Survey found that the relationship between receipt of advice to quit by a health care provider and use of cessa-

tion aids was strongest among Medicaid recipients and the uninsured, compared with smokers with private health insurance (17). A separate analysis of the 2005 National Health Interview Survey found that use of pharmacotherapy more than doubled among young adult smokers (aged 18 to 24 years) who received advice to quit smoking from a health care provider (25).

First released by the Agency for Health Care Policy and Research (now the Agency for Healthcare Research and Quality) in 1996 (31) and updated by the United States Public Health Service in 2000 (32), the clinical practice guideline for treating tobacco use and dependence recommends an evidence-based set of clinical practices to ensure that every smoker receives support and treatment for smoking cessation at every clinical visit (see **Table 1**). For frontline clinicians and the health care systems in which they work, the guideline recommends the 5As: Ask all patients about their smoking status and record it in their medical records; advise all smokers to quit smoking; assess the willingness of each smoker to make a quit attempt; assist smokers willing to make a quit attempt by providing health care or community-based counseling and prescribing pharmacotherapy; and arrange for follow-up, preferably during the first week after a planned quit date.

The guidelines were visionary in recognizing the importance of health care system changes in institutionalizing tobacco-dependence treatment rather than relying solely on clinicians to take action. The guideline-recommended health care system strategies include implementing tobacco-user identification systems; providing education, resources, and feedback; dedicated staff to foster the delivery of treatment; hospital policies to support inpatient cessation services; insurance coverage for evidence-based behavioral and pharmacological treatments; and accountabilities and reimbursement for clinicians to deliver cessation treatments as a routine part of clinical care. The Task Force on Community Preventive Services (TFPCS) made similar

TFPCS: Task Force on Community Preventive Services

Table 1 Treating tobacco use and dependence clinical practice guideline summary and recommendations

1. Tobacco dependence is a chronic condition that often requires repeated intervention.
2. Because effective tobacco-dependence treatments are available, every patient who uses tobacco should be offered at least one of these treatments if they are willing to try quitting or a brief motivational intervention if they are unwilling to try quitting.
3. Clinicians and health care delivery systems should institutionalize the consistent identification, documentation, and treatment of every tobacco user seen in a health care setting.
4. Brief tobacco-dependence treatment is effective, and every patient who uses tobacco should be offered at least brief treatment.
5. There is a strong dose-response relation between intensity of treatment and its effectiveness. Treatments involving person-to-person contact are consistently effective, and their effectiveness increases with treatment intensity.
6. Three types of behavioral therapies are especially effective: practical counseling (problem solving/skills training), provision of social support as part of treatment, and help in securing social support outside of treatment.
7. Unless contraindicated, pharmacotherapies should be used with all patients attempting to quit smoking. First-line pharmacotherapies include Bupropion SR, nicotine gum, nicotine inhaler, nicotine nasal spray, and nicotine patch. Second-line pharmacotherapies that may be considered are Clonidine and Nortriptyline.
8. Over-the-counter nicotine patches are effective relative to placebo and their use should be encouraged.
9. Tobacco-dependence treatments are cost-effective relative to other medical and disease prevention interventions. As such, insurers and purchasers should ensure that insurance plans include counseling and pharmacotherapeutic treatments as reimbursed benefits, and that clinicians are reimbursed for providing tobacco-dependence treatment as they are for treating other chronic conditions.

Table based on Reference 32, pp. 3–5.

recommendations in the 2001 *Guide to Community Preventive Services* (48, 49).

This review has two primary aims. The first is to review the current evidence base for the role of health care system supports in increasing tobacco cessation, with a particular emphasis on studies published since Manley et al.'s review on the role of health plans in tobacco control (67). The review draws on primary research, on published meta-analyses (e.g., Cochrane Collaboration reviews), and on recent reviews and syntheses of this literature (24, 34, 51). The second aim is to discuss future directions for health care systems in increasing tobacco cessation from the perspectives of research needs, changing public health priorities, and changing models of health care organization and financing.

EVIDENCE SUPPORTING SYSTEMS-LEVEL INTERVENTIONS TO ADDRESS TOBACCO USE

A relatively small number of individual studies, in addition to expert opinion, informed the health care system recommendations in

the United States Public Health Service Clinical Practice Guideline and the TFCPS community guidelines. In the years since the Manley et al. review, authors have yielded a respectable number of new studies of health care system strategies to increase smoking cessation. This new research explores the effectiveness of strategies at the practice, organizational, and financial levels and is summarized below.

Practice-Level Strategies

Practice-level strategies include tobacco user identification systems, provider education, reminder systems, and feedback.

Tobacco-user identification systems. Tobacco-user identification systems, such as expanded vital signs, chart stickers, or computerized systems, increase the rates at which clinicians ask patients about tobacco use and document this information in the medical record (1, 8, 12, 33, 75, 79).

Research on whether these systems by themselves spur greater action by clinicians beyond documentation is mixed. On the basis

of studies published prior to May 2000, the TFCPS concluded that tobacco-user identification systems increased the number of health care providers who advise smokers to quit (48). Two recent studies cast doubt on that conclusion. Piper et al. found that the expanded vital signs resulted in a significant increase in asking about smoking status, but rates of advice to quit, assistance with quitting, and abstinence rates were either unchanged or decreased (75). Similarly, Boyle & Solberg found that the expanded vital signs resulted in increased chart documentation of tobacco use during clinic visits (from 38% to 78%) but decreased chart documentation of advice about smoking (from 34% to 19%). The authors also found that patient self-reports of advice to quit did not change after the expanded vital signs were implemented (8).

Provider education, reminder systems, and feedback. The TFCPS review of multicomponent interventions, comprising both provider education and reminder systems, found that these combined strategies improved the delivery of evidence-based tobacco-dependence treatments. However, there was insufficient evidence to recommend provider education as a stand-alone strategy (48).

The Cochrane Collaboration conducted a meta-analysis to evaluate the effectiveness of training health care professionals in delivering smoking cessation interventions and to assess the additional effects of prompts and reminders. The review concluded that training increased rates of intervening with smokers, and these rates were further improved with the addition of clinician prompts and reminders (58). The review did not find evidence for a direct effect of provider training on patient smoking cessation outcomes.

A separate Cochrane Collaboration review examined audit and feedback in clinical practice (not limited to tobacco-dependence treatment) and concluded that these strategies resulted in small to moderate improvements in provider performance, with larger effects seen

when initial performance was low and when feedback was delivered in a more intensive fashion (53).

Recent evaluations of audit and feedback with regard to tobacco-dependence treatment have supported these conclusions. Andrews and colleagues studied a multicomponent intervention comprising provider education and feedback (2). The authors found that provider education alone did not improve clinical practice, but the addition of feedback significantly improved rates of advice, assistance, and arranging follow-up. McAfee et al. studied whether automated performance feedback and senior-level incentives would have an effect on compliance with a new tobacco status identification and intervention system (68). Results indicated a tenfold increase in the rate of tobacco-user identification and more than a threefold increase in documentation of provider advice and intervention after feedback and incentives were implemented (68). Bentz and colleagues studied whether practice feedback generated from an electronic medical record would change rates of referrals to a state tobacco cessation quitline and found increased rates of advice, assessment, and assistance among practices in clinics receiving the intervention compared with those in control clinics (4). A recent study by Wadland and colleagues demonstrated a twofold increase in practice-based referrals to a tobacco-cessation quitline among practices that received comparative feedback compared with those receiving general reminders (88). The feedback provided in both the Bentz et al. and Wadland et al. studies utilized an Achievable Benchmarks of Care approach that has been effective in improving diabetes care (57).

Dedicated staff. The 2000 United States Public Health Service Clinical Practice Guideline health care system recommendations urge health care systems to communicate the importance of routine assessment and intervention with tobacco users and identify a staff person (e.g., nurse, medical assistant) who could coordinate such treatments. Given

JCAHO: Joint Commission on Accreditation of Health Care Organizations

PMPM: per member per month

the time constraints in clinical practice (office visits average 14.7 minutes in length) (47), designating a tobacco-dependence treatment coordinator can support and augment the role of frontline clinicians. Having dedicated staff can help create a systematized team approach to addressing tobacco in the clinical setting, rather than relying on the physician to conduct all tobacco cessation activities.

Hospital Policies to Facilitate Cessation

Implementing hospital policies and protocols that facilitate tobacco cessation represents an opportunity to systematically intervene with smokers and provide tobacco-dependence treatment during the inpatient stay. The Joint Commission for Accreditation of Healthcare Organizations (JCAHO) issued a standard in 1992 requiring all accredited hospitals adopt a policy prohibiting smoking in the hospital. Subsequent research found that 96% of hospitals surveyed complied with the JCAHO standard by 1994. Additionally, more than 40% of hospitals surveyed had implemented a policy stricter than the JCAHO standard (63).

Interventions targeting patients in the inpatient setting have been rigorously evaluated and found to be effective. An updated review published by the Cochrane Collaboration in 2007 concluded that “High intensity behavioural interventions that begin during a hospital stay and include at least one month of supportive contact after discharge promote smoking cessation among hospitalised patients. . . . Interventions of lower intensity or shorter duration have not been shown to be effective in this setting” (71; 78, p. 2).

Health Care Financing Strategies

Insurance coverage. The TFCPS concluded that reducing costs borne by patients for such treatment increased both the number of people who used cessation therapies and the number of successful quitters (48). A Cochrane Collaboration review of health

care financing systems to increase the use of tobacco-dependence treatment found that full coverage of tobacco-dependence treatment results in increased self-reported sustained abstinence rates at relatively low costs compared with either a partial or no benefit (56).

Researchers have also published cost estimates for providing such treatment. Curry et al. compared the use and cost-effectiveness of three forms of smoking cessation service coverage with a standard form of coverage (23). People with full coverage (e.g., no cost-sharing requirement) made more quit attempts compared with people with a cost-sharing requirement. Although quit rates were lower among people with full coverage, the positive population impact of full coverage was greater than the other forms of coverage tested. The per-member-per-month (PMPM) cost ranged from \$0.07 to \$0.41, depending upon the extent of coverage. Subsequent research by Schauffler et al. and Burns et al. has also demonstrated modest PMPM costs for cessation coverage. Schauffler et al. reported a range of \$0.47 to \$0.73 PMPM (81). Burns et al. reported a PMPM cost of approximately \$0.13 (9).

Provider reimbursement and incentives.

Insufficient insurance reimbursement is often cited as a barrier to providing preventive services such as smoking cessation treatment (46). There is a limited body of literature that has evaluated payment or other financial incentives directed toward clinicians to improve health care quality or to foster treatment of tobacco use. An eight-year insurance industry study found that reimbursing physicians for provision of preventive care resulted in reported increases in exercise, seat belt use, and weight loss, as well as decreased alcohol use and a trend toward decreased smoking (62). Because most providers receive reimbursement from multiple insurers, it can be difficult to evaluate the effect of reimbursement on counseling for smoking cessation. For example, in one study of the effect of a \$150 payment from a managed care

organization to obstetricians for each pregnant smoker they counseled, only four claims were submitted out of 21 eligible smokers (60). Only a small proportion of patients in each participating practice were insured through the managed-care organization offering reimbursement, and most clinicians were unaware of a patient's insurance coverage when they interacted with the patient during a visit, which could account for the low claim rates. This study highlights the importance of uniformity in providing reimbursement across the multiple insurance plans with which providers contract.

A general review of the literature on incentive use in health care had mixed findings (37). Among studies that provided incentives to individual providers, five had positive results and two had negative results; among studies that provided incentives to groups, one had a positive result and two had negative results. The magnitude of incentives provided varied greatly, from \$0.80 per flu shot provided to a \$10,000 annual bonus per group. Four of the five studies that evaluated fee-for-service incentives had positive results; two of the four studies that evaluated bonuses were positive. In general, performance incentives were more effective when the indicator measured required less patient cooperation compared with more active patient cooperation or participation. Given the mixed results, the authors conclude that "the potential to improve quality through the use of incentives remains unknown" (37, p. 188).

Specific to tobacco use, Roski et al. evaluated a performance incentive provided to clinics that achieved preset targets for asking about tobacco use and advising smokers to quit, comparing results to clinics that had both the option to receive financial incentives and a smoker registry and to clinics in a control condition (80). The authors found that patients receiving care in clinics that received the financial incentive were significantly more likely to have their tobacco use status identified. They also found that patients receiving care in clinics with a centralized smoker

registry were more likely to access counseling services than patients in clinics without the registry.

This area may be ripe for further study owing to advances in information technology. These include common billing codes for the 5As in electronic medical records used in the Bentz et al. study (4) and the development of software able to code free-text clinical notes into measures of the 5As (45). Both of these tools can be used to calculate tobacco cessation measures needed for pay-for-performance incentives.

FROM RESEARCH TO PRACTICE

National guidelines supported by scientific evidence are meaningful only if they are implemented (21). Progress in addressing tobacco use and dependence through the health care system in the decade since the release of the first clinical practice guideline is encouraging (24). The inclusion of accountability for addressing tobacco use and dependence in national health care reporting systems clearly encourages health care systems to prioritize tobacco cessation. Currently the Healthcare Effectiveness Data and Information Set (HEDIS) of the National Committee for Quality Assurance (NCQA) includes three measures related to tobacco cessation: patient reports of advice to quit from their physician and the offer of behavioral and pharmacological treatments. In 2005, JCAHO added a measure of the number of inpatients who smoke that receive advice or counseling for smoking cessation during their hospital stay as a core measure for acute myocardial infarction (AMI), congestive heart failure, and community-acquired pneumonia. Both primary care provider advice to quit and postmyocardial infarction counseling to quit smoking are included in the Agency for Healthcare Research and Quality's Annual Healthcare Quality Report.

National survey data show an increase in reported advice to quit smoking from a health

HEDIS: Healthcare Effectiveness Data and Information Set

NCQA: National Committee for Quality Assurance

care provider from between 40% and 50% in the mid-1990s to 62% in the mid-2000s (73). NCQA HEDIS measures from 2006 indicate that 71% of smokers or recent quitters with commercial insurance received advice to quit smoking from their health care provider, and 39% reported discussing smoking cessation strategies. Rates were lower among smokers with Medicaid coverage; 66% were advised to quit and 34% reported discussing smoking cessation strategies (NCQA, personal communication). National rates for the JCAHO measures for the period July 1, 2005 through June 30, 2006 were 95% (AMI), 89% (heart failure), and 86% (community-acquired pneumonia). In contrast, national rates for the previous year were 89% (AMI), 78% (heart failure), and 75% (community-acquired pneumonia) (55).

There have also been improvements in insurance coverage. Both Medicare and the Veterans Administration have added coverage for behavioral counseling and pharmacotherapy treatments. A total of 42 state Medicaid programs cover at least some evidence-based tobacco cessation treatment (compared with 22 in 1997) (24). A recent survey by America's Health Insurance Plans reported that 97% of health maintenance organizations provide coverage for some form of evidence-based tobacco cessation treatment (69). A public domain calculator for insurers and employers that provides individualized estimates of achievable cost savings from investment in smoking cessation is available at <http://www.businesscaseroi.org>.

All of this is encouraging, but gaps remain between what is possible and what is done by health care systems to impact tobacco cessation. Although rates of asking about smoking status and advising smokers to quit are high, delivery of assistance and arranging for follow-up are substantially less frequent. NCQA data indicate that among the 71% of smokers receiving advice to quit, only 39% of those smokers discuss smoking cessation strategies with their provider. This means that only 28% of smokers actually receive

assistance for quitting during routine health care visits. Moreover, there are disparities in rates of provider advice and use of evidence-based treatment, with the lowest levels found among African American, Latino, uninsured, and low-income smokers (50, 61, 95). With regard to insurance coverage, only 20% of employers include coverage of smoking cessation treatments in their primary plans, which tend not to be health maintenance organizations (7, 24). Manley et al.'s review challenges health plans to become more actively involved in tobacco control at both the clinical and community levels and proposes the 5Cs model (covering, counseling, capitalizing, collaborating, and counting) to facilitate their involvement (67).

The gap between what is known and what is done must be closed if we are to reduce the toll of disease, death, and cost resulting from tobacco use. Closing this gap will be facilitated by continued research to improve the evidence base and eliminate knowledge barriers, by implementing a comprehensive approach in the health care setting to address behavioral risk factors and by considering opportunities to promote tobacco cessation in changing health care models. The following section examines future directions from these three perspectives.

NEW DIRECTIONS AND OPPORTUNITIES

Health Care Systems Research

A robust knowledge base is one of three key ingredients for effective health policy (3, 77). At a recent State of the Science meeting at the National Institutes of Health, a number of research opportunities were identified that focus on broadening the impact of clinic-level strategies, increasing linkages between health care systems and community resources, understanding the impact of performance measures, and measuring the health economics of addressing tobacco in health care (34).

With regard to clinic-level strategies, we know approaches such as tobacco-user identification systems are successful in improving the documentation of tobacco use, but they do not necessarily result in further intervention. Thus, a key research question is, what strategies can be implemented and evaluated to foster provision of cessation assistance and follow-up for patients who smoke? One possible approach is to better integrate population-based treatments such as quitlines or web-based cessation services into clinical systems. Because of competing priorities and the brevity of a clinical visit, it has been recommended that the 5As be shortened to 2As and an R (ask, advise, and refer) (83). Evidence for the effectiveness of this approach will come from studies of optimal ways to link patients to treatment during routine health care visits.

Although improvements in rates of addressing tobacco in health care have been seen following the addition of tobacco-related measures to national reporting systems, the impact of HEDIS and JCAHO measures on patient outcomes has not been evaluated. In addition, the current JCAHO measures apply only to smokers with certain diagnoses. Future research could examine the impact of a JCAHO requirement mandating that tobacco use be addressed for all hospital admissions.

Similarly, a number of research questions remain with regard to using incentives or pay-for-performance approaches to changing clinical practice, particularly in light of the recent Glickman et al. study that found no significant improvement in quality of care or outcomes for AMI, or any increases in adverse events, among hospitals participating in pilot projects sponsored by the Centers for Medicare and Medicaid Services (41). A recent paper by Christianson and colleagues outlines a research agenda that includes understanding of the incremental effect of pay-for-performance, learning the unintended consequences of this strategy, evaluating the impact of overlapping incentive programs, understanding organizational factors that mitigate its impact, and longitudinal research to under-

stand if changes in medical practice stimulated by pay-for-performance represent short- or long-term changes (14).

In the current climate of ever growing health insurance costs, managed care plans and purchasers of insurance are reluctant to add coverage for smoking cessation treatment in the absence of a strong business case for a return on their investment. Of value would be research examining the health care cost consequences of smoking cessation for specific groups, including pregnant women, parents of young children, and older adults aging into Medicare who use health care most often. There are no definitive studies of whether successful quitters who use a tobacco cessation benefit have higher satisfaction with their health care, or if they change health insurance or health care providers more or less frequently than the average person. These data would address concerns of insurers and health plans that longer-term economic benefits of smoking cessation would be lost because of high turnover rates. With regard to environmental tobacco smoke, there are no studies that specifically examine changes in health care utilization and costs for children of smokers who quit smoking.

Changing Public Health Priorities for Behavioral Risk Factors

Although tobacco use remains the number one cause of premature morbidity and mortality in the United States, it is accompanied by unhealthy diet, sedentary lifestyle, and risky drinking as the nation's leading causes of preventable illness and death. Spending on preventable diseases associated with these behavioral risk factors (e.g., cardiovascular disease, cancer, stroke, and diabetes) accounts for up to 70% of health care expenditures in the United States (22). In recent years, the public health community has increased its attention on obesity because of alarming increases in its prevalence and the accompanying increase in the incidence of obesity-related diseases such as diabetes. Although there is no

empirical evidence for focusing on only one behavioral risk factor at a time, it is easy to get the impression that concern about obesity has diminished tobacco cessation as a priority. To illustrate, a search of news coverage for the month of May 2007 through LexisNexis using the key terms tobacco or obesity in addition to health and health care returned 447 articles for obesity and 47 for tobacco. For May 2000, the number of articles was 15 for obesity and 54 for tobacco.

Thought leaders recognize that the successes and challenges of tobacco control efforts provide valuable lessons for addressing behavioral risk factors to reduce obesity, including the imperative to address behavioral risk factors in the health care system (27, 38, 42, 43, 66, 70, 91, 92, 94). The health care system approaches recommended by the clinical practice guideline and supported by research (e.g., vital signs, reminder systems, education and feedback, and insurance coverage for evidence-based treatments) are applicable to other behaviors, including diet and physical activity. Thus, one way to enhance the impact of health care systems on tobacco cessation could be to scale up from addressing tobacco use to addressing multiple behavioral risk factors versus supporting multiple redundant systems. This is the approach taken by the Robert Wood Johnson Foundation program, Prescription for Health (15).

A future vision for integrating health care system approaches for tobacco use and dependence with other behavioral risk factors could avoid the siloing and competition among specific behaviors that often lead to confusion and inaction in health care delivery (74). In reality, risk factors overlap and nearly 60% of adults have two or more behavioral risk factors. Among smokers, 46% are overweight or obese, 61% have sedentary lifestyles, and 34% are risky drinkers (30). Moreover, health behavior change is important for both prevention and management of chronic diseases (6).

Moving toward an integrated health care system approach to behavioral risk factors suggests additional important research top-

ics. Most health care system-based research focuses on single behaviors. Glasgow and colleagues outlined 15 hypotheses to test for interventions addressing multiple behaviors in primary care (39). The hypotheses focus on the patient-clinician interactions as they impact patient outcomes (e.g., effects of consistent assessment of behavioral changes with feedback to patients, identifying patient characteristics for selecting single versus multiple behavioral targets, the effect of patient choice of target behaviors on success), and practice-level strategies as they impact clinician practices (e.g., the effect of quality improvement practices such as panel and practice-level feedback, the impact of interactive computer technology to prompt implementation of the 5As, and the effect of systems for outreach to community-based patient support services).

The Chronic Care Model (CCM) is a widely disseminated paradigm for redesigning health care systems to be more proactive and focused on keeping people healthy rather than reactively treating preventable conditions (89). Because the elements of the model comprise all of the system approaches recommended for tobacco use, it provides a unifying approach for dealing with multiple behavioral risk factors (40). The CCM focuses on ensuring productive patient and provider interactions through health care system supports that include (a) clinical information systems (e.g., electronic medical records, patient registries), (b) decision support (e.g., clinical practice guidelines), (c) delivery system design (e.g., designated roles and accountabilities for all clinic staff), (d) provision of self-management support (e.g., referral to evidence-based behavioral treatment within the health care system or in the community), and (e) broad external support. To illustrate the model's broad acceptance and influence in the health care system, both NCQA and JCAHO have developed accreditation and certification programs for chronic disease management based on the CCM. The model has been adopted by the U.S. Department of Health and Human Services Bureau of Primary Health Care as well

as by the Centers for Medicare and Medicaid Services.

Changing Health Care Models

Greater attention to tobacco use and dependence in the context of the CCM embraces a redesign and refocusing of the health care practice setting. The future impact of health care systems on smoking cessation will also depend upon changes in overall models of health care organization and financing. As noted above, performance initiatives that include measures and incentives related to tobacco use and dependence may hold promise. When health care organizations put a percentage of their health care premiums at risk for meeting targets, such as the percentage of patients with up-to-date smoking status information in their records or rates of referral of smokers to treatment, this can provide an impetus for ensuring that frontline clinicians have the training and resources to achieve these targets efficiently. Information collected to assure that targets are being met can be used to provide aggregate and individual-level feedback.

The majority of individuals use the health care system with insurance (although a staggering 18% of the population is uninsured), and the majority of insurance is provided through employer-subsidized plans (16). As insurance premiums rise in response to ever increasing health care costs, some believe that there is an “inexorable march towards the demise of employer health insurance” (29, p. 1538). An alternative model of consumer-directed health care (CDHC) is gaining momentum (5). In this model, high deductible health insurance plans are combined with tax-free health savings accounts that can be used to offset deductible payments. This reduces employers’ health care costs and gives individuals a considerable financial stake in their health care costs. Full consideration of the potential advantages and considerable disadvantages of CDHC is beyond the scope of this review. There are serious concerns that

this model penalizes the sick, will discourage individuals from seeking needed health care (including preventive care), and will increase health disparities, all while failing to have a substantial impact on health care costs (5, 26, 93). Nonetheless, the movement toward CDHC highlights the potential role of consumer demand in shaping health care practices and utilizing proven smoking cessation treatments.

In response to CDHC, efforts are underway to provide individuals with information to guide their use of health care. Much of this information centers on the cost and quality of care provided by different health care systems. Which quality indicators are posted sends a message about health priorities. Given that tobacco cessation is a high national health priority, tobacco-related indicators should be posted, such as rates of implementing the 5As, rates of treatment utilization, or quit rates. In addition to information about the costs of treatment, information about avoidable health care costs (i.e., cost savings) that result from high-quality preventive care including treatment for tobacco use cessation should be posted. In this way, smokers can come to expect (or even demand) that their health care providers address tobacco use as part of routine health care and can hope to realize long-term health benefits and their attendant financial gains (22).

CONCLUSIONS

A significant amount of progress has been made in integrating tobacco-dependence treatment into the health care delivery system, but by no means is this work finished. As described above in this review, significant gaps between what is known to be effective and what actually occurs in health care persist. Closing these gaps is the single most effective way to improve public health. Implementing evidence-based strategies to facilitate the treatment of tobacco dependence must be a priority for the U.S. health care system. Simply stated, addressing tobacco specifically, and

CCM: Chronic Care Model

CDHC: Consumer-Directed Health Care

behavioral risk factors more generally, must be a standard of care across all levels of the health care system. Four steps for achieving this goal relate to training, outside influences on the health care system, resources and accountabilities within the health care system, and public demand (22).

Standards of care are codified in the training and licensing of health care providers. If addressing tobacco is an expected competency during training, it is more likely to be a standard of care during practice (20). It is critical that training not be implemented as the sole intervention to improve care; the evidence is clear that training must be part of a multicomponent strategy (e.g., implemented in combination with the system changes discussed earlier in this review) to be most effective in changing practice.

Health care systems respond to outside influences (82). Employers, who provide the majority of health insurance, can demand coverage for tobacco treatment in their basic insurance packages and hold health care systems accountable in their financing strategies for employee coverage. This can also occur by ensuring that addressing tobacco continues to be included as a standard for accreditation by major organizations. NCQA and JCAHO can expand their inclusion of tobacco-related measures and include these measures in public reports of health care quality.

Health care providers need resources and accountabilities for addressing tobacco use and dependence. As information technology becomes more widespread in health care delivery through computerized health records and other clinical information systems, the basic design of those systems must include the collection and use of information about tobacco use status and discussion of tobacco use during clinical visits. Templates or standardized language used in all electronic medical records can aid in monitoring trends in addressing tobacco use.

Finally, the power of the individual must not be ignored. When health care providers discuss tobacco use with their patients who smoke and when they recommend treatment and follow up with them, it increases patients' satisfaction with their health care (18, 76). Patients should expect that tobacco use will be addressed as part of routine health care—and if it is not, patients should understand that they are not receiving high-quality, comprehensive health care.

The knowledge and tools to systematically address tobacco use, and by extension, other health risk behaviors, are readily available. It is time to ensure that these supports are woven into the fabric of the health care delivery system to further reduce the premature morbidity and mortality resulting from health risk behaviors such as tobacco use.

SUMMARY POINTS

1. Health care systems are essential in fostering tobacco cessation.
2. Health care system changes implemented at the practice, organizational, and financial levels are effective in improving the delivery of tobacco-dependence treatment to patients that use tobacco.
3. Despite the growing evidence base that health care system changes are effective in improving the delivery of tobacco-dependence treatment, such strategies are not routinely implemented by health care systems, which represents a significant missed opportunity to address the leading cause of premature morbidity and mortality in the United States.
4. Closing the gap between what is known to be effective and what is done in practice can be facilitated by continued research to improve system strategies and eliminate

knowledge barriers, by incorporating tobacco cessation into efforts to address other modifiable health risk behaviors and by ensuring that tobacco cessation is a priority in the changing health care and insurance environment.

FUTURE DIRECTIONS

1. Addressing tobacco use should be a standard of care and expected competency for all clinicians.
2. Addressing tobacco use should continue to be included as a standard for accreditation by major organizations, and these measures should be routinely reported as indicators of health care quality.
3. Templates or standardized language for clinical information systems and electronic health records should be designed to permit standardized reporting on how tobacco use is addressed in the clinical encounter.
4. Patients should expect that tobacco use will be addressed as part of routine health care and that failure to address tobacco use is an indicator of less-than-comprehensive health care.
5. New research to evaluate (*a*) strategies to foster provision of cessation assistance and follow-up for patients that use tobacco, (*b*) the impact of national accountability standards (e.g., HEDIS and JCAHO measures) on patient outcomes, (*c*) the effectiveness of incentives such as pay-for-performance to change clinical practice, and (*d*) the health care utilization and cost consequences of smoking cessation for special populations (e.g., pregnant women, parents of young children, and older adults) should be conducted.
6. Lessons learned from systems change research for tobacco to other health risk behaviors should be applied, which would result in an integrated approach to addressing behavioral risk factors in the health care setting.
7. The effect of changes in the health care marketplace, such as CDHC, on demand for and utilization of tobacco-dependence treatment and other preventive services should be evaluated.

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