in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). *Am J Prev Med*. 1994;10(2): 77-84.
28. Graham AL, Papandonatos GD, Bock BC, et al. Internet- vs telephone-administered questionnaires in a randomized trial of smoking cessation. *Nicotine Tob Res*. 2006; 8(suppl 1):S49-S57.
29. Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM Jr. Social ties and susceptibility to the common cold. *JAMA*. 1997;277(24):1940-1944.
30. Cohen S. Social supports and physical health. In: Greene A, Cummings M, Karraker K, eds. *Life-Span Developmental Psychology: Perspectives on Stress and Coping*. Hillsdale, NJ: Erlbaum Associates; 1991.
31. Hughes JR, Benowitz N, Hatsukami D, Mermelstein RJ, Shiffman S. Clarification of SRNT workgroup guidelines for measures in clinical trials of smoking cessation therapies. *Nicotine Tob Res*. 2004;6(5):863-864.
32. National Center for Health Statistics National Health Interview Survey, 2007. http://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm. Accessed March 23, 2009.
33. Thorpe KE, Zwarenstein M, Oxman AD, et al. A pragmatic-explanatory continuum indicator summary (PRECIS): a tool to help trial designers. *CMAJ*. 2009;180(10): E47-E57. doi:10.1503/cmaj.090523.
34. Green LW, Glasgow RE. Evaluating the relevance, generalization, and applicability of research: issues in external validation and translation methodology. *Eval Health Prof*. 2006;29(1):126-153.
35. Abrams DB, Orleans CT, Niaura RS, Goldstein MG, Prochaska JO, Velicer W. Integrating individual and public health perspectives for treatment of tobacco dependence under managed health care: a combined stepped-care and matching model. *Ann Behav Med*. 1996;18(4):290-304.
36. Levy DT, Graham AL, Mabry PL, Abrams DB, Orleans CT. Modeling the impact of smoking-cessation treatment policies on quit rates. *Am J Prev Med*. 2010;38 (3)(suppl):S364-S372.

INVITED COMMENTARY

Integrating Comprehensive Tobacco Treatment Into the Evolving US Health Care System

It's Time to Act

Tobacco use remains the leading preventable cause of death in the United States, contributing to unsustainable health care costs and unacceptable socioeconomic disparities in disease burden.[1] Clearly, treating tobacco use and dependence should be a high priority for physicians and for all those who organize, provide, and pay for health care. Unfortunately, this is not the case. Despite its recognition as a chronic disease,[2] the availability of therapies that are among the most cost-effective in health care,[3] and evidence-based clinical guidelines,[4] tobacco dependence has not been treated with the respect and attention it deserves by the US health care system.[1]

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As health care provision evolves in the era of health care system reform, how can we ensure that tobacco dependence treatment is no longer neglected? How can we integrate tobacco treatment into the newly envisioned systems for providing and paying for health care, from ambulatory-based, patient-centered medical homes and neighborhoods to more comprehensive integrated health care provision systems such as accountable care organizations?

A substantial body of evidence indicates that we need a comprehensive care management system for tobacco dependence similar to the systems being used to manage other chronic diseases.[4,5] A tobacco care management system should look like this:

- The tobacco use status of every patient encountered in any setting (inpatient and outpatient, primary and specialty care) is routinely assessed and recorded in a way that allows easy identification of a registry of tobacco users (ie, all the tobacco users for whom a health care professional, practice, or health care organization is responsible).
- Every tobacco user who presents for care is routinely advised to quit, briefly offered appropriate evidence-based tobacco treatment (including Food and Drug Administration [FDA]–approved pharmacotherapy), and automatically linked to affordable resources in the health care system or community that supplement the health care professional's brief visit-based effort. Such resources would include counseling and medication management provided in person, by telephone, or via the Internet.
- Visit-based care is supplemented with "direct-to-smoker" outreach from the practice or health care system that offers treatment to the entire population of smokers for whom the organization is responsible.
- Treatment is coordinated centrally across sites of care and over time.
- Evidence-based tobacco dependence treatment, including counseling and medication, is reimbursed without constraints that limit access to care, such as preauthorization and substantial copayments. Coverage policies should recognize the relapsing nature of tobacco dependence and allow for multiple courses or long-term use of all FDA-approved medications, including nonprescription nicotine replacement products.
- A health care system's performance in providing tobacco treatment to patients (and eventually in achieving the outcome of tobacco use cessation) is routinely monitored as a quality indicator, reported back to the system, and publicly reported.

To build this system, models of treatment demonstrated to be efficacious in research settings must be adapted to fit into real-world health care provision and reimbursement structures. The care of smokers after an acute myocardial infarction (MI) is a good example. These patients benefit more rapidly and substantially from quitting than any other group of smokers.[6] The efficacy of initiating tobacco treatment during a hospital stay for MI

was first demonstrated in 1990.[7] A randomized controlled trial found that a nurse-provided behavioral counseling program begun in the hospital and continued by telephone for 3 months after discharge nearly doubled the proportion of smokers who abstained from tobacco at 1-year follow-up, from 32% to 61%. Subsequent clinical trials replicated and extended the work, demonstrating the efficacy of hospital-initiated smoking intervention for all patients, not just those admitted for MI.[8] A 1993 cost-effectiveness analysis using data from the original 1990 trial found that initiating tobacco treatment during a hospital admission for acute MI and continuing contact after discharge was more cost-effective than virtually all other post-MI treatment then in routine use.[9]

In the past 17 years, post-MI and tobacco treatment standards have changed substantially. Therefore, it is welcome to have an updated cost-effectiveness analysis by Ladapo et al in this issue of the *Archives*.[10] Using new evidence regarding treatment efficacy and generally conservative assumptions about costs and survival benefits, the investigators estimated a cost-effectiveness ratio of $5050 per quality-adjusted life-year for a counseling-only program and $11 400 to $13 700 per quality-adjusted life-year if a full 3-month course of smoking cessation pharmacotherapy is also included.

The analysis was carefully done, although I would quibble with a few details. Most notably, the authors model a nurse-provided program, but a nurse's training and salary are not required. A more realistic model would have a certified tobacco treatment counselor (often a health educator or social worker) provide counseling under a nurse's supervision. This option is explored in the sensitivity analysis, producing a 23% decrease in estimated program cost and even greater cost-effectiveness. Either way, their main finding is clear. In 2010, as in 1993, hospital-initiated tobacco treatment is as or *more* cost-effective than any other standard component of post-MI care that physicians, hospitals, health care systems, and payers would be faulted for failing to provide.

The original 1993 article was accompanied by an editorial asserting that a routine, hospital-based smoking intervention for patients with MI was "an idea whose time had come."[11] Unfortunately, it had not. Despite the evidence, the intervention was not widely adopted. Tobacco was a neglected cardiac risk factor in an era when aggressive risk factor management was emphasized.

Why were these results not translated into practice? Can we expect this new evidence to have any different effect? A major reason for the failure to adopt the tobacco intervention program was that it did not fit readily into the prevailing structure of US health care provision or reimbursement. No single organization could do it all. Hospitals could provide the inpatient counseling, but they neither felt responsible for nor were reimbursed for postdischarge care. The visit-based fee-for-service reimbursement system in ambulatory care did not cover telephone calls. Putting the program into practice required coordinating a patient's care over time and across inpatient and outpatient treatment settings. This concept of care management for chronic diseases was essentially unknown. Since then, the health care environment has changed substantially. Building systems of care to improve the outcomes of patients with chronic diseases is now a priority. Systems of reimbursement are beginning to shift from rewarding visit and procedure volumes to rewarding the value that treatments offer patients and society.

Incentives for hospitals to address tobacco use appeared in 2004, when the Joint Commission began public reporting of national hospital quality measures.[12] These measures included assessment of whether smokers discharged with acute MI (or congestive heart failure or pneumonia) received advice or assistance to quit smoking during their hospital stay. Public reporting led hospitals to pay greater attention to tobacco than ever before. Over time, hospitals' performance on this measure increased, but the existing measure is imperfect. It does not require hospitals to connect patients to the postdischarge care needed to make the intervention effective in the long term, and the measure itself can be "gamed."[12] Revised tobacco measures that address these problems are under development[13] and should be adopted.

Evolving technologies such as the Internet could offer new options for smoking cessation. If they are effective, health care professionals could refer to them to support and extend their own office-based efforts. Originally, health care professionals referred smokers to in-person smoking cessation programs, but these programs attracted relatively few smokers despite proven efficacy. In the 1990s, telephone counseling replaced most in-person efforts to improve the accessibility, convenience, privacy, and cost-effectiveness of treatment. The efficacy of proactive (ie, counselor-initiated) telephone counseling was clearly established,[14] and it is included in national clinical tobacco treatment guidelines.[4] Today, a network of state-funded quit lines with a common access number (1-800-QUIT-NOW) offer telephone counseling free to smokers nationwide.

The emergence of the Internet offered the prospect of further increasing the reach, effect, and cost-effectiveness of tobacco treatment.[15] The Internet's interactive and social networking features offer new ways to tailor treatment to a smoker's unique situation and provide the social support that clearly contributes to treatment success. These interventions could be accessed at any hour and might attract groups such as younger smokers who are less likely to access treatment in other ways. Visionaries began to combine Internet- and telephone-based interventions into an integrated program.

Evidence of the effectiveness of Internet-based intervention is just beginning to appear. Less is known about the marginal benefit or cost-effectiveness of adding Internet interventions to telephone counseling (or vice versa). The 2008 US clinical treatment guidelines judged Internet-based interventions to be promising but without a sufficient evidence base for endorsement as standard treatment.[4] A subsequent meta-analysis of 9 trials, which included some newer trials, found Internet-based treatment to be effective in adults,[16] but given the heterogeneity of interventions tested and the complexities of study designs, the jury is still out.

The article by Graham and colleagues[17] in this issue of the *Archives* makes an important contribution to the literature. Those authors conducted a randomized controlled trial to compare the effectiveness of a real-world Web site with strong social networking features to the same

Web site plus telephone counseling. Both conditions were compared with a static information-only Web site that lacked the tailoring and social networking functions hypothesized to promote smoking cessation. Contrary to expectations, the fully functional Web site was no better than the static Web site. However, adding telephone counseling to either Web site increased smoking cessation rates significantly. Whether the combination is also more cost-effective than Web-based counseling now needs to be addressed. Testing the reverse combination—the marginal benefit of adding the Internet component to telephone counseling—would also be valuable given the ubiquity of telephone counseling services. If the promise holds, Internet-based tobacco treatment could provide an exciting new component to tobacco care management.

Going forward, we will need more than evidence and real-world models to succeed in giving tobacco treatment the priority it deserves in the evolving health care system. We will also need a receptive environment. Fortunately, recent federal health policy developments, including provisions in the health care system reform law (Affordable Care Act), are promising.

- In August 2010, federal standards guiding "meaningful use" requirements for electronic health records mandated that smoking status be recorded in a coded field.[18] Emerging accreditation standards for patient-centered medical homes have a similar requirement. These mandates will promote the development of tobacco registries and encourage the new models of primary care practice to prioritize tobacco treatment.
- In October 2010, the Affordable Care Act began to require states to cover a comprehensive tobacco cessation benefit for pregnant women in Medicaid programs.[19] States should extend these benefits to all smokers enrolled in Medicaid, as 6 states already do.[20] Taking this action can reduce smoking prevalence in the Medicaid population.[21]
- In 2011, the Centers for Medicare and Medicaid Studies will begin piloting accountable care organizations, integrated care provision systems with novel reimbursement systems that put a premium on prevention and care coordination. Tobacco care management strategies should fit easily into the accountable care organization model.
- In 2013, the Affordable Care Act will offer states a financial incentive to cover all preventive services graded A or B by the US Preventive Services Task Force.[19] Tobacco treatment clearly qualifies. When exact regulations are written, they must define treatment to include all treatments endorsed by clinical treatment guidelines,[4] including all (even nonprescription) FDA-approved medications and all cost-effective counseling methods.

These developments, along with ongoing efforts by health care systems and payers to systematize the provision of high-quality care and improve chronic disease management, make me hopeful that a comprehensive tobacco care management system can and *will* be integrated into the evolving health care provision system. In doing so, we will learn lessons not only about tobacco treatment but also about how to manage other health-related behaviors with major public health effects; we will save countless lives and avert untold suffering. It is time to act.

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Financial Disclosure: Dr Rigotti has consulted without pay for Pfizer Inc and Free & Clear Inc. Her institution has received research grant funding from Pfizer, sanofi-aventis LLC, and Nabi Biopharmaceuticals to study investigational and/or marketed smoking cessation aids.

1. Schroeder SA, Warner KE. Don't forget tobacco *N Engl J Med*. 2010;363(3):201-204.
2. Steinberg MB, Schmelzer AC, Richardson DL, Foulds J. The case for treating tobacco dependence as a chronic disease. *Ann Intern Med*. 2008;148(7):554-556.
3. Institute of Medicine, Committee on Identifying Priority Areas for Quality Improvement. *Priority Areas for National Action: Transforming Health Care*. Washington, DC: National Academies Press; 2003.
4. Fiore MC, Jaén CR, Baker TB, et al. *Treating Tobacco Use and Dependence: 2008 Update: Clinical Practice Guidelines*. Rockville, MD: US Dept of Health and Human Services, Public Health Service; 2008.
5. Sherman SE. A framework for tobacco control: lessons learnt from Veterans Health Administration. *BMJ*. 2008;336(7651):1016-1019.
6. Critchley JA, Capewell S. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review. *JAMA*. 2003;290(1):86-97.
7. Taylor CB, Houston-Miller N, Killen JD, DeBusk RF. Smoking cessation after acute myocardial infarction: effects of a nurse-managed intervention. *Ann Intern Med*. 1990;113(2):118-123.
8. Rigotti NA, Munafo MR, Stead LF. Smoking cessation interventions for hospitalized smokers: a systematic review. *Arch Intern Med*. 2008;168(18):1950-1960.
9. Krumholz HM, Cohen BJ, Tsevat J, Pasternak RC, Weinstein MC. Cost-effectiveness of a smoking cessation program after myocardial infarction. *J Am Coll Cardiol*. 1993;22(6):1697-1702.
10. Ladapo JA, Jaffer FA, Weinstein MC, Froelicher ES. Projected cost-effectiveness of smoking cessation interventions in patients hospitalized with myocardial infarction. *Arch Intern Med*. 2011;171(1):39-45.
11. Orleans CT, Ockene JK. Routine hospital-based quit-smoking treatment for the postmyocardial infarction patient: an idea whose time has come. *J Am Coll Cardiol*. 1993;22(6):1703-1705.
12. Chassin MR, Loeb JM, Schmaltz SP, Wachter RM. Accountability measures—using measurement to promote quality improvement. *N Engl J Med*. 2010;363(7):683-688.
13. Screening and treating tobacco and alcohol use. The Joint Commission Web site. http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Screening+and+Treating+Tobacco+and+Alcohol+Use.htm. Accessed August 10, 2010.
14. Stead LF, Perera R, Lancaster T. A systematic review of interventions for smokers who contact quitlines. *Tob Control*. 2007;16(suppl 1):i3-i8.
15. Abrams DB, Graham AL, Levy DT, Mabry PL, Orleans CT. Boosting population quits through evidence-based cessation treatment and policy. *Am J Prev Med*. 2010;38(3)(suppl):S351-S363.
16. Myung S-K, McDonnell DD, Kazinets G, Seo HG, Moskowitz JM. Effects of Web- and computer-based smoking cessation programs: meta-analysis of randomized controlled trials. *Arch Intern Med*. 2009;169(10):929-937.
17. Graham AL, Cobb NK, Papandonatos GD, et al. A randomized trial of Internet and telephone treatment for smoking cessation. *Arch Intern Med*. 2011;171(1):46-53.
18. Blumenthal D, Tavenner M. The "meaningful use" regulation for electronic health records. *N Engl J Med*. 2010;363(6):501-504.
19. Save lives and money: help people on Medicaid quit tobacco. Lung USA Web site. http://www.lungusa.org/assets/documents/publications/other-reports/medicaid-cessation-report-2010.pdf. Accessed August 10, 2010.
20. McMenamin SB, Halpin HA, Bellows NM, Husten CG, Rosenthal A; Centers for Disease Control and Prevention (CDC). State Medicaid coverage for tobacco-dependence treatments— United States, 2007. *MMWR Morb Mortal Wkly Rep*. 2009;58(43):1199-1204.
21. Land T, Warner D, Paskowsky M, et al. Medicaid coverage for tobacco dependence treatments in Massachusetts and associated decreases in smoking prevalence. *PLoS One*. 2010;5(3):e9770. doi:10.1371/journal.pone.0009770.