

# An Electronic Health Record–Based System to Improve Tobacco Treatment

*Kruse GR, Kelley JH, Linder JA, et al. Implementation of an electronic health record-based care management system to improve tobacco treatment. J Gen Intern Med 2012;27:1690–6.*

## Study Overview

**Objective.** To examine the feasibility and acceptability of an electronic health record (EHR)–based internal referral system to increase provision of tobacco treatment.

**Design.** Mixed study design using quantitative methods to examine utilization of the referral system, and qualitative methods to obtain perspectives from primary care providers (PCPs) on the feasibility and acceptability of the referral system.

**Setting and participants.** The study took place in 2 community health centers in Boston, Massachusetts. Both health centers used a locally developed EHR that included progress notes, laboratory results, medication lists, electronic prescribing, and clinical reminders. A total of 36 PCPs (21 physicians, 3 nurse practitioners, and 12 physician trainees) participated in this study between February 2010 and July 2011. The Tobacco Care Management System was built into the existing clinic infrastructure, and involved a 1-click referral to a tobacco treatment coordinator (TTC). When a provider documented a patient’s smoking status, they were prompted to refer the patient to the TTC. The TTC received an email when a patient was referred and re-

sponded by calling the patient up to 3 times for tobacco cessation counseling. The phone calls would include an assessment, screening for medication contraindications, brief tobacco treatment counseling, and referrals to more intensive services if the patient expressed interest (eg, multisession tobacco counseling and 2 weeks of free nicotine replacement therapy from the telephone quit line, or in-person counseling at the health center). The TTC entered the outcome of the referral into a research database, placed a note in the EHR, and offered feedback to the PCP. PCPs were trained to use the 1-click referral system, and could refer any smoker whom they felt would benefit from this service. The TTC sent a performance report of monthly referrals to the medical directors of both clinics. The medical director of Health Center 1 forwarded the reports to the PCPs, whereas the director of Health Center 2 did not. Quantitative measurements included the proportion of referrals to the system, number of call attempts, number of patients reached by phone, and the number who accepted referrals to more intensive treatment services. Qualitative assessment included two 1-hour focus groups of PCPs, where topics such as patient selection, barriers to use, and experience with programmatic feedback were explored.

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**Main results.** Over the 18-month study period, 2894 smokers made 28,032 visits to the health centers (16% of all visits). There were demographic differences between the 2 health centers: Health Center 1 had a greater proportion of white smokers (85% versus 34%,  $P < 0.001$ ) and patients who were privately insured (42% versus 24%,  $P < 0.001$ ) than Health Center 2. During the study period, there were 466 referrals to the TTC for 422 smokers (15% of all known smokers). Smokers who were referred did not differ in demographic characteristics compared with those who were not referred. Forty-two smokers were referred more than once. Of the 36 PCPs, 29 used the 1-click referral system. PCPs in Health Center 1 (366 referrals) referred more than those in Health Center 2 (100 referrals). PCPs in Health Center 1 received monthly performance reports whereas those in Health Center 2 did not. Of the 1064 calls made to the 466 referred smokers, the TTC was able to reach 260 smokers (56%). The proportion of smokers reached did not differ by health centers (55% in Health Center 1 versus 58% in Health Center 2,  $P = 0.65$ ). Of the 260 smokers who were contacted by the TTC, 29% agreed to be referred to intensive smoking cessation services. A lack of a functional telephone (11%) and inability to be reached despite 3 attempts (89%) were the main reasons for not reaching the remaining 206 smokers.

Twenty-four PCPs attended the focus groups. All PCPs felt that the 1-click referral system to an internal TTC was easy to use and most felt that it augmented (rather than replaced) the treatment that they provided during the patient's visits. Some PCPs referred smokers regardless of their readiness to quit in order to trigger an interest in smoking, whereas others referred only those who set a quit date. Some PCPs were discouraged by the fact that the TTC was unable to reach a large proportion of referred smokers. PCPs reported that the monthly performance reports served as an incentive to refer patients to the service. PCPs who used the system frequently felt that the 1-click referral and feedback from the TTC fit into their workflow.

**Conclusion.** The study established the feasibility and acceptability of an EHR-based tobacco care management referral system to improve access to evidence-based tobacco treatment for patients seeking care in community health clinics.

## Commentary

The adoption of the EHR presents unique opportunities for health care systems to improve the delivery and quality of health care. As part of EHR implementation, health centers are required to adhere to the meaningful use criteria, a set of standards that are intended to track and improve patient outcomes. The current study described the implementation of an EHR-based tobacco care management referral system to improve the delivery of tobacco cessation treatment among patients seeking care in community health settings. The study established the feasibility and acceptability of the referral system, and demonstrated a potential for the system to improve the delivery of and outcomes related to smoking cessation treatment.

The tobacco care management referral system had several features that made it easy to use. To refer patients to the tobacco care management system, PCPs had to go through only 1 prompt in the EHR. Compared to a system where PCPs referred to an outside, community-based telephone quit line [1], the Tobacco Care Management referral system was internally placed and integrated into the primary care workflow. This allowed for a direct 2-way communication between the TTC and the provider, where the former was able to provide monthly feedback and performance reports to the providers. This interaction served as an incentive for PCPs to use the referral system. The system was set up to enlist the support of another provider to refer patients to more intensive tobacco treatment, largely through state-funded telephone quit lines.

Of all the smokers who were seen during the study time period, 15% were referred to the TTC. This rate of referral was equivalent to the rate observed for referrals to community-based telephone quit lines. Although the TTC was able to reach 56% of smokers, a minority of those smokers were interested in more intensive treatment for tobacco cessation. This may be because some of the referred smokers were unmotivated to quit smoking. Those who may have been less motivated may have had fewer contacts and lower acceptance of additional treatment options. While this was a discouragement to PCPs, the authors offered suggestions on ways to improve treatment for these patients. For those unmotivated to quit, the TTC could tailor messages to induce smokers to engage in the process of smoking cessation (eg, practice quit attempts) without requiring immediate abstinence [2]. This may increase the

likelihood of referred smokers from any stage of quitting to participate in the smoking cessation counseling program. Despite the low rate of referrals to more intensive smoking cessation treatment, the study was able to connect approximately 3% of known smokers to the state quit line. The Tobacco Care Management system was set up to increase awareness and referrals to the state-supported telephone quit line, thereby increasing use of an underutilized, state-supported cessation resource.

The study had several limitations. It was conducted in 2 clinics, one of which had a well-insured and predominantly white patient population, thereby limiting generalizability of the findings to other clinic populations and health systems. As with all successful EHR-based quality improvement initiatives, the implementation of an intervention should ideally be associated with improvement in patient outcomes. In this study, the absence of information on smoking cessation outcomes among patients who participated in the referral program is a limitation that merits further exploration. Some PCPs referred patients more than once; whether this was associated with improved smoking cessation outcomes also merits further exploration. To implement the intervention, clinics will need to allocate additional resources (eg, a counselor and/or care coordinator) to provide tobacco treatment, which may limit feasibility in some settings. The system may have limited applicability to patients who move frequently (eg, patients who are homeless or unstably housed) or lack a regular telephone number, necessitating other methods to maintain con-

tact with these patients (eg, in-person counseling when patients are in clinic).

**Applications for Clinical Practice**

The current study highlights a systems-based approach to increase access to evidence-based tobacco cessation treatment among low-income populations. With increasing adoption of the EHR, health systems, particularly those that serve low-income populations, should consider implementing EHR-based interventions that increase documentation of tobacco status, improve provider-initiated counseling, and increase access to tobacco cessation treatment. Although the designation of a tobacco cessation counselor may pose challenges to health systems that are resource-constrained, the potential benefits from improving access to and outcomes from smoking cessation treatment may offset the cost of implementing such an intervention. To demonstrate success and to increase reproducibility of these interventions in other settings, data on patient outcomes and cost-effectiveness will be crucial.

—*Maya Vijayaraghavan, MD*

**References**

- 1 Rothemich SF, Woolf SH, Johnson RE, et al. Promoting primary care smoking-cessation support with quitlines: the QuitLink Randomized Controlled Trial. *Am J Prev Med* 2010;38:367-74.
- 2 Carpenter MJ, Hughes JR, Gray KM, et al. Nicotine therapy sampling to induce quit attempts among smokers unmotivated to quit: a randomized clinical trial. *Arch Intern Med* 2011;171:1901-7.

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