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Organizational Systems to Support Publicly Funded Tobacco Treatment Services

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Abstract

Background: Professional societies and government organizations have promoted guidelines and best practices that encourage clinicians to routinely integrate cessation counseling into patient encounters. While research in health maintenance organizations has demonstrated that the development and maintenance of office systems do enable clinicians' smoking-cessation services, little is known about the adoption of system strategies in diverse organizations serving disadvantaged populations.

Methods: Data were collected via face-to-face interviews from November 2001 to October 2002 using a standardized systems assessment checklist at service delivery sites of 83 funded community health service agencies, which included hospitals, community health centers, and other organizations (e.g., substance abuse, mental health, and multiservice). The content of the structured assessment reflected system elements with proven effectiveness that have been included in guidelines and best practices recommendations. Detailed information was collected on the implementation strategies.

Results: This study found considerable attention to systems that support cessation services in diverse healthcare organizations, but much remains to be done. There is a wide diversity of implementation strategies employed, with varied degrees of sophistication.

Conclusions: A major challenge is to develop systems capable of providing population-based feedback to, and between, providers, which will enable further quality improvement efforts.

Introduction

Tobacco use is the leading preventable cause of death in the United States, responsible for >440,000 deaths annually,^{1,2} and resulting in 5.6 million years of potential life lost, \$75 billion in direct medical costs, and \$82 billion in lost productivity.² The potential health benefits of smoking cessation are substantial,³ and evidence mounts supporting the effectiveness of behavioral and pharmacologic interventions.^{4,5} Professional societies and government organizations have promoted guidelines and best practices that encourage clinicians to routinely integrate cessation counseling into client and patient encounters, focusing on clinician intervention, smoking-cessation counseling, and pharmacotherapy.⁶

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Awareness of the health threat of tobacco use and knowledge of guidelines, however, are insufficient for routine and vigorous application by busy clinicians.^{7,8} For preventive services and chronic disease management, there is growing evidence that institutionalization of office systems is key to practice improvement and integrating the guidelines for daily use.^{3,9-11} These systems include implementing procedures for identifying and documenting tobacco users, prompting providers to intervene, providing resources and feedback to providers to support intervention with patients, providing dedicated staff and performance evaluation, and assuring benefit coverage and reimbursement. Previous work has described the adoption of systems to support cessation services in health maintenance organizations.^{7,10,12} No studies, however, describe the adoption of systems approaches among a wide range of organizational types, notably those serving disadvantaged populations.

This paper reports on a structured assessment of the prevalence and patterns of organized procedures and systems to support tobacco treatment services adopted by health organizations that are funded by a state public health initiative. Specifically, this paper (1) describes the extent of organizations' adoption of office systems elements for smoking cessation reflective of national consensus guidelines; (2) describes the variability in the implementation methods of selected system elements; (3) explores the extent and nature of variability of systems strategies among types of service delivery sites (i.e., primary care, entire health center, specialty care/medical, mental health/substance abuse, multiservice/others); and (4) explores how the systems in place for tobacco compare (thoroughness and strategy) with systems that organizations have in place for their self-selected "model" clinical prevention or screening service.

The Massachusetts Tobacco Control Program (MTCP) was a comprehensive prevention program of the state's Department of Public Health.^{13,14} It included an aggressive public education media campaign, promotion of changes in local laws and health regulations, educational and intervention programs to prevent tobacco use, and interventions to promote cessation. This study, the systems assessment (SA), was part of a larger National Cancer Institute-funded study that examined Massachusetts policy designed to make effective tobacco treatment services available to adult tobacco users, especially those at greatest risk (e.g., underserved, low-income, cigarette industry-targeted minority groups, and populations with high comorbidity).

The state-sponsored component for tobacco treatment was implemented over three waves of funding through request for applications (RFA) mechanisms. In all three waves, MTCP specified that proposals must address populations at risk and provided examples such as stated above. The review process included evaluation of this component. During the first RFA in 1994, 66 smoking-cessation programs were funded in hospitals, community health centers, and substance abuse treatment programs across the state. The primary scope of work for the funded agencies was to implement the 4A's (ask, advise, assist, arrange) intervention, and to deliver outreach and community education.

In 1997, there was a second RFA with important changes in the model, productivity goals, and contract outcome measures, and 48 programs were funded. The MTCP implemented a unit reimbursement rate for individual and group tobacco treatment and pilot tested reimbursement for nicotine replacement therapy. To address the varying levels of experience and training among smoking-cessation counselors, MTCP funded a competency-based tobacco treatment specialist (TTS) training and certification program through the University of Massachusetts Medical School.

The third wave of funding in 2000 again mandated programs to rebid, and provided support for 86 programs in community health service agencies (CHSs) across the state. The 4A's now were expanded to 5A's and included "assess," consistent with updated guidelines.⁵ In addition,

at least one TTS at each funded program was required to become certified. A full range of services that included 5A's delivery by clinicians, group and individual counseling sessions, and the provision of nicotine replacement therapy (patch or gum) were reimbursed.

Methods

Participating Organizations and Respondents—The 86 funded agencies (CHSs) in the third wave were eligible for the study. These included hospitals, community health centers, and an assorted “other” category (i.e., substance abuse; mental health; Women, Infants, and Children [WIC]; multiservice). Many of the CHSs had multiple referral service sites. For example, a hospital might be the funded CHS, but provided contracted services in different locations in its catchment area, such as a community health center or a substance abuse treatment center. Criteria were developed for selecting one referral site in order to obtain one “snapshot” of systems within the CHS. The primary TTS identified the site that produced the most referrals to the tobacco treatment program during the past 6 months. In some cases, subjective estimates were made because not all CHSs kept records of referrals by source. Four TTS respondents reported that all clients were self-referred or from “word of mouth.” In these cases, the TTSs were asked to identify a clinic or department within the site that provided at least some referrals. Respondents were identified based on their knowledge of clinical and office documentation systems, specifically those related to preventive screening and tobacco-cessation services. Some interviews were conducted with several people depending on the site representative's recommendation of who could provide the best information. This research was approved by the Institutional Review Board at the University of Massachusetts Medical School.

Measures and Data Collection—The SA standardized checklist was developed to capture adoption and implementation of system strategies with proven efficacy that have been included in guidelines and “best practices,”^{4,5} and that built on previous work of the investigators^{12, 15} and others.¹⁶ The checklist focused primarily on profiling the systems and procedures in place that would support the MTCP intervention strategies. The checklist was piloted in six diverse nonparticipating service sites and refined. Major sections of the assessment include: (1) background information on the site and populations served, 8 items; (2) description of client care documentation systems in place (e.g., intake form records, integrated record, claims forms), 4 items; and (3) office systems that enable tobacco-control and smoking-cessation services, 11 items, plus two follow-up items. Because a “system” may be implemented in a variety of ways, we asked for descriptions and documentation, referred to as “implementation descriptors.” We also asked respondents to provide information on a clinical prevention or screening service for which they thought their administrative systems were the most sophisticated or most developed. The systems in place in the self-identified “model service” could then be compared with the tobacco system elements.

Data were collected via face-to-face interviews by trained research staff when all programs were funded (November 2001 to October 2002). Before the interview, a letter was sent to the SA site's identified respondent requesting that samples of office forms (e.g., clinical intake and general visit form, medical/clinical record forms) and data on client population served annually be available at the time of the interview. The length of the interviews ranged from 20 to 101 minutes, with an average of 46 minutes. Inter-rater reliability among the three field staff and research coordinator conducted during training averaged 96%, and was continued quarterly in the field resulting in 96% average reliability.

Data Management and Analyses—The SA data were double entered using Epi Info, version 6 (Centers for Disease Control and Prevention, Atlanta GA, 2001), and mismatched entries were resolved. DBMS/Copy, version 7 (Data Flux Corp., Cary NC, 2002) was used to transform the Epi Info entries into an SAS data set (SAS Institute Inc., v9.1, Cary NC, 2002).

Variables were labeled and formatted in SAS, and then a codebook was made from the contents procedure. Program identification numbers were verified to make sure all forms were entered, and the distribution of all variables was checked for outliers and to resolve any missing responses.

Distributions were calculated for the SA items. Branch patterns diagrams were constructed to illustrate the implementation descriptors for each system element. Summated nonweighted scores were calculated for the model prevention service system elements and for the tobacco system elements. Bivariate descriptions were generated. Fisher's exact tests were used to compare systems in place across sites. Analysis of variance was used to compare mean systems scores across sites. Data were analyzed in 2003 and 2004.

Results

Settings and Respondents—Sites from 85 of the 86 funded organizations were eligible. One site was ineligible due to conflict of interest in the evaluation. Representatives of 83 sites completed the assessment, representing a 97% response rate.

As reported in Table 1, a diverse group of sites was represented that included primary care clinics, entire health centers, specialty care clinics, specific clinics or departments within agencies (e.g., outpatient substance abuse, mental health/substance abuse agencies), and a mixed group of other sites, such as WIC/nutrition or family planning clinics. Key informant respondents most commonly were clinical directors, but had variable lengths of time in the position.

Documentation Systems—Table 2 reports the individual elements in general, and specifically for tobacco treatment. The vast majority of sites had standardized documentation systems for their general services, including intake forms, integrated records, and claims forms. Use of a separate encounter form for each visit (other than billing) was less prevalent.

Tobacco System Elements—As reported in Table 2, respondents were queried about the 11 elements of supportive systems for tobacco treatment, and a majority answered affirmatively for many of the elements, such as provider prompts, smoking status documentation, and procedures for TTS referral. For other elements, the reported prevalence was lower (e.g., self-help material distribution, clinician counseling protocol, and pharmacotherapy use). Some system elements were reported by less than half of the respondents, notably those for tracking a smoker's progress, and the feedback loop mechanism from the TTS to the referring provider. There were significant differences by referral site type in reported systems in place, although some comparisons could not be made because of small sample size. For example, sites that were entire health centers were significantly ($p=0.05$) more likely (100%) to report a protocol for clinicians to provide cessation counseling and follow-up, than were primary care sites (62.58%). Significant differences were also observed between entire health centers versus mental health organizations ($p=0.015$), and versus multiservice sites ($p=0.0006$). There were also differences among the sites reporting that providers prescribed/recommended pharmacotherapy ($p<0.001$). Primary care and entire health center sites were more likely to report that providers prescribed or recommended pharmacotherapy (88% and 100%, respectively, $p<0.001$), than specialty care and mental health sites (58% and 46%, respectively), which were higher again than multiservice sites.

We created an average score for the 11 tobacco treatment system elements (range 0 to 11), noted in Table 3. Paired t -tests indicated that health center sites were significantly different from all other site types ($p<0.011$ for all comparisons), and had the highest mean scores. The mean total system scores are reported in Table 3.

Figure 1 illustrates the diversity of implementation approaches to prompting clinicians to ask about tobacco status. Eight sites reported no system. Preprinted forms are common for prompting, and are frequently included in the intake form. A variety of staff persons are responsible for making sure that they are in place for the responsible clinician, both representative of the particular service site. Figure 2 illustrates the implementation variation for documenting smoking status. Eight sites reported no system, while 75 sites reported a variety of strategies for documentation, the most common being the intake/history form (89%) and the clinic notes (75%); and the problem list (about two thirds). Figure 3 illustrates the implementation descriptors for the system element “documentation of referral to the TTS.” All organizations had a specialist to whom clinicians could refer, but 22% of them had no documentation system for referrals. Of those that did, multiple procedures were reported. The majority noted the referral in the clinical record. However, to efficiently track referrals, a cumulative logging system is necessary. A smaller proportion reported this capability by computer ($n=8$, 13%) or paper ($n=20$, 32%).

Comparison to Model Service—The diversity of sites in which the SA was conducted was reflected in the “model” preventive service selected by the respondents. One third selected cancer screening (16% mammography, and 17% cervical); 18% substance abuse screening; 12% depression/mental health; 10% diabetes; and the remainder selected others, such as cholesterol and HIV. We asked about four generic systems elements for their selected model service. As reported in Table 4, the majority of SA sites reported several key elements for their model preventive service. For example, 98% reported a system to document the services had been scheduled or performed. We created a summated score for the SA respondent’s reported “model system” (data not shown). There was no significant difference in score ($p=0.91$) between SA site types, and there was no correlation between the summated scores for the model service and the tobacco systems score ($r=0.06$, $R=0.58$).

Discussion

The importance of organizing a medical practice for delivery of preventive services, including adopting systems related to tobacco treatment services, is well documented.^{17,18} This analysis is among the first to investigate adoption of system elements to support tobacco treatment in diverse types of health service organizations and to profile the variety of strategies used in such systems. The study demonstrates a considerable level of adoption of selected system elements, notably clinician prompts and record documentation. Other strategies had lower adoption; for example, about one third of service organizations in this study reported having a written protocol, compared to 72% in a recent review of nine HMOs.¹² For some systems, implementation elements such as feedback to providers is low in all settings, including HMOs.

Health centers were significantly more likely to report more systems in place. Variability across type of site may be explained by the mission and services of the organization. For example, primary care clinicians are more likely to have prescribing privileges for pharmacotherapy. Similarly, mental health/substance abuse sites and specialty medical sites were significantly less likely to report procedures for clinicians to provide cessation counseling/education than were primary care, health center, and multiservice sites. This may reflect their traditional mission and the process where they referred to the TTS specialist. Data management capability also differed by organization and/or site.^{10,11} Many study sites do not have computerized MIS systems, hampering feedback and assembling aggregate data.

Data collected on the organization’s self-assessed “model preventive service” highlighted substantial adoption of system elements. Additionally, there was no significant difference between referral site type in a summated score for the model service, while there was for the summated tobacco score. This could in part reflect the differences in site missions, as well as

the longer adoption of tobacco services within the organization. For example, community health centers have focused on tobacco issues more traditionally than have mental health organizations, and may have been refining systems for their model service for many years. Systems for some preventive services such as reporting mammography rates have been expected by payors for years, probably prompting development of systems capable of population-based reporting. Thus, a combination of motivators may be in place to strengthen systems. As noted earlier, many study sites do not have computerized tracking systems, which hampers conducting quality improvement studies and giving feedback to individual clinicians about strategies with demonstrated efficacy in improving practice in their practice panel. The implementations in Figures 1 to 3 echo the finding that while documentation might be there if the record for an individual is in hand, there is no way to efficiently obtain aggregate data for measuring overall individual clinician or organizational performance.

Early in the MTCP program, investment was made in training primary care clinicians in principles and skills for intervening with their patients who smoke. Interestingly, only 34% of the organizations reported having a protocol for clinicians to provide smoking counseling. This may be a trade-off of the tobacco specialist strategy. MTCP's strategy to fund a TTS, a professional identified as a separate healthcare provider to whom clinicians may refer, may be a better way of providing skilled intervention and of tracking "fee for service" data, (e.g., number of patients referred for counseling, number of patients seen by TTS, number of patients who completed group or individual sessions).¹⁹ However, maximal use of TTS resources requires the clinician to remember to refer, as well as the ability to track referrals. The climate at MTCP-funded facilities (e.g., turnover and/or lack of personnel, lack of consistent funding to maintain a specialist, etc.) must be kept in mind when assessing the relative value of approaches.

What This Study Adds ...

Previous work has demonstrated the efficacy of office systems to enhance and enable clinicians' smoking-cessation interventions with their patients.

The effective adoption and implementation of systems has been reported primarily in studies within staff/group not-for-profit health maintenance organizations.

This project studied systems adoption for smoking cessation in a wide variety of organizational settings serving disadvantaged populations.

Further, it profiles the diversity of modes used to implement various system strategies.

There are several limitations to this study. While it is the first study to investigate sites from a wide variety of types of organizations, the sites are not necessarily representative of the organization or other sites providing similar services. Additionally, these CHSs may not be representative of similar organizations, as they were motivated to apply for state funds. It is reasonable to assume, however, that adoption of tobacco treatment system elements would be even lower in organizations who had not applied. Efforts were made to investigate the various strategies involved in implementing each system element; however, we did not investigate perceptions about each element's reliability or usefulness.²⁰ While the summated system scores do not reflect any relative value among the elements, we do think the scores provide some modicum of comparison across organizations.

In summary, these MTCP-supported service sites have implemented many of the tobacco service system elements recommended by public health organizations, and have done this using a wide variety of strategies. These accomplishments have been made within the context of a constrained health service environment,²¹ and one that is more complex than generally

acknowledged.²² This is exemplified by both the diversity in organizational types, and in the approaches to implement system improvements. While progress has been made in the development of systems to support tobacco treatment services, many challenges remain to translate the evidence about system support into routine clinical practice. Quality improvement efforts can explore alternative, feasible, and reliable strategies to enhance and ensure tobacco treatment.

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Figure 1.
System to prompt providers to ask about tobacco status. *Responses not mutually exclusive.
MH/SA, mental health/substance abuse.

Figure 2.
Documentation of smoking status. *Responses not mutually exclusive.

Figure 3.
Documentation of referrals to tobacco treatment specialist. *Responses are not mutually exclusive.

Table 1
Characteristics of CHS or selected CHS referral site and respondents (*n*=83)

	Referral site type				
	Primary care ^a	Entire health center ^b	Specialty care/medical ^c	Mental health/substance abuse ^d	Other ^e
Total number of CHS patients served annually (range, mean, SD) ^f	560-18,000 x=8959 (5665)	3422-11,953 x=7765 (3290)	60-35,690 x=6917 (12,869)	70-4500 x=1295 (1056)	425-14,600 x=3521 (4342)
Services provided <i>n</i> (%) ^{f,g}					
Primary care	25 (96%)	9 (100%)	6 (50%)	2 (8%)	
Substance abuse counseling	2 (8%)	4 (44%)	1 (8%)	25 (96%)	1 (10%)
Mental health services	10 (39%)	5 (56%)	3 (25%)	20 (77%)	1 (10%)
Prenatal care	8 (31%)	7 (78%)	8 (17%)	3 (12%)	
Dental services	2 (8%)	2 (22%)		1 (4%)	
Pediatric services	6 (23%)	9 (100%)	4 (33%)		
Nutrition counseling	18 (69%)	7 (78%)	6 (50%)	6 (23%)	6 (60%)
Other ^h	9 (35%)	8 (89%)	11 (92%)	14 (54%)	8 (80%)
Patients eligible for referral to tobacco treatment specialist <i>n</i> (%) ^g					
Men	26 (100%)	9 (100%)	12 (100%)	26 (100%)	5 (50%)
Women	26 (100%)	9 (100%)	12 (100%)	23 (89%)	9 (90%)
Pregnant women	25 (96%)	7 (78%)	8 (67%)	23 (89%)	8 (80%)
Adolescents aged <18 years	11 (42%)	9 (100%)			8 (80%)

CHS, community health service agency; SD, standard deviation.

^aPrimary care sites included adult and internal medicine clinics and other sites that defined themselves as providing primary care medical services exclusively.

^bEntire health center means that the center itself was the focus and that a variety of multiservices is provided in a single physical facility.

^cSpecialty care/medical included a wide variety of sites, such as surgery, pulmonary, or cardiac rehabilitation, diabetes clinics, and emergency departments.

^dMental health/substance abuse included sites that focused primarily on one or both of these issues, and typically the providers were social workers, case workers, or counselors.

^eOthers were sites which provided either a very specific service (e.g., influenza vaccinations) or broader services, such as Women, Infants and Children (WIC) nutrition, family planning, or multiservices social service organizations.

^fSixty-three CHSs provided this information.

^gCategories are not mutually exclusive.

^hSome examples include advocacy and referral, social services, optometry, podiatry, domestic violence counseling, HIV services, day surgery, elder services, tuberculosis services, radiology/lab services, pulmonary function testing, cardiology and/or pulmonary rehabilitation.

Table 2
Systems assessment elements and reported adoption (*n*=83)^a

System elements	<i>n</i> (%)
General office documentation systems (yes)	
1. Clinical intake or medical history form (<i>n</i> =83)	78 (94.0)
2. General or repeat visit form (<i>n</i> =73)	40 (54.8)
3. Integrated records (<i>n</i> =83)	74 (89.2)
4. Systems for general claims form submission (<i>n</i> =78)	74 (94.9)
Office systems for tobacco treatment (yes)	
1. Written policies or protocols (<i>n</i> =82)	28 (34.1)
2. Reminders or prompts to providers to ask about tobacco (<i>n</i> =83)	75 (90.4)
3. Documentation of smoking status in clinical record (<i>n</i> =83)	75 (90.4)
4. Routine distribution of self-help materials (<i>n</i> =82)	50 (61.0)
(a) Documentation of self-help materials distribution in clinical record (<i>n</i> =50)	22 (44.0)
(b) Person responsible for material availability (<i>n</i> =49)	48 (98.0)
5. Protocol for clinicians to provide smoking/cessation counseling or education (<i>n</i> =83)	49 (59.0)
6. Pharmacotherapy recommendations or prescriptions (<i>n</i> =83)	51 (61.4)
7. Track smokers' progress and/or process of care (<i>n</i> =83)	33 (39.8)
8. Procedures for making referrals to TTS (<i>n</i> =82)	77 (93.9)
9. Documentation of referrals (<i>n</i> =81)	63 (77.8)
10. Feedback mechanism from TTS to referring provider (<i>n</i> =80)	34 (42.5)
11. Periodic record review for documentation of tobacco use status and treatment (<i>n</i> =79)	44 (55.7)

TTS, tobacco treatment specialist.

^aThe *n* varies for items because the question was not answered.

Table 3Mean total tobacco system score by referral site type^a

Referral site type	<i>n</i>	Mean	SD	Minimum	Maximum
Entire health center	9	0.821	0.117	0.600	1.000
Primary care	26	0.653	0.172	0.417	1.000
Mental health/substance abuse	26	0.616	0.212	0.250	1.000
Specialty care/medical	12	0.576	0.199	0.333	0.917
Multiservice/other	10	0.567	0.183	0.333	0.833

SD, standard deviation.

^aF=2.98, *p* value=0.024.

Table 4
Systems elements in place for comparative model preventive service ($n=81$)

System element	Frequency (%)
1. Written policies or protocols ($n=81$)	69 (85.2)
2. Documentation that services has been scheduled/performed ($n=81$)	79 (97.5)
3. Reminder for provider to perform or talk about service ($n=65$)	48 (73.8)
4. Referrals to have service performed ($n=65$)	33 (50.8)
(a) Documentation of referrals ($n=33$)	31 (93.9)
(b) Feedback to staff on status of patient's referral ($n=33$)	25 (75.8)