

Tobacco treatment implementation within 28 commission on cancer accredited programs in the Northeast region of the USA: A pilot study

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Abstract

Cancer survivors are a rapidly growing population and an important target for tobacco treatment interventions. Continued smoking after the diagnosis of cancer is associated with a higher risk of cancer recurrence and mortality. Systematic tobacco cessation programs are effective. This study surveyed American College of Surgeons Commission on Cancer (CoC) programs in the Northeast region of the USA regarding their tobacco control programs. Seventy percent of cancer survivors are treated within CoC programs. The purpose of this study was to describe the extent of implementation of tobacco treatment and determine the organizational delivery of tobacco treatment as measured by the presence of goals to address smoking, leadership support, and integration of tobacco treatment guidelines into care delivery. Data were collected by a survey. The Assessment of Chronic Illness Care questionnaire was used to collect data on implementation of tobacco treatment services. Descriptive statistics were used to analyze the data. Most programs (78.6%) had an electronic health record and of these 68% captured smoking status. Implementation of tobacco treatment was not optimal for identifying smokers, providing patients with community linkages or self-care cessation support. Implementation of decision aides for pharmacotherapy and reassessment of smoking status were the least developed areas. Moreover, the organizational delivery for tobacco treatment was less than optimal. Many cancer programs have not implemented systems to deliver optimal tobacco treatment. Efforts should be made to help cancer programs develop sustainable system-wide programs that address the urgent need to deliver tobacco treatment to all cancer survivors.

Keywords

Tobacco use, Cancer survivors, Tobacco treatment programs, Cancer programs, Implementation of tobacco treatment services

INTRODUCTION

There are 15.5 million cancer survivors in the USA, with a doubling expected by 2050 [1, 2]. Smoking rates are high among cancer survivors; 38% of those aged 18–44 years and 23% aged 45–64 years [3]. Smoking cessation after the diagnosis of cancer is essential. Multiple studies have identified the association between continued smoking and adverse effects such as decreased effectiveness of cancer treatment, decreased quality of life, increased cancer

Implications

Practice: Evidence-based tobacco treatments are available, yet are not delivered consistently due to multiple barriers including lack of clinician knowledge, time, and a system-level approach to integrate clinical decision support into the workflow of routine clinical care.

Policy: Recent changes in health policy that promote the meaningful use of electronic health records and clinical decision support to improve clinical care have the potential to seamlessly integrate tobacco treatment into the routine care of cancer survivors.

Research: This work illustrates that cancer programs have not developed optimal systems to implement essential tobacco treatment services into routine care.

recurrence, and decreased survival among survivors who continue smoking [4–8]. It was not until 2014, however, that the surgeon general published a landmark report concluding that there was a causal relationship between continued smoking and adverse outcomes, including cancer specific and all-cause mortality [8]. This report has created a paradigm shift underscoring the importance and urgent need to identify sustainable and scalable ways to deliver tobacco cessation services to cancer survivors who continue smoking [9, 10].

Evidence-based guidelines for tobacco treatment are available. The Public Health Service sponsored an update of a clinical practice guideline related to tobacco dependence treatment in 2008 [11]. A panel of experts conducted a systematic review and meta-analysis to identify best practices for optimal tobacco treatment. The guideline contained key recommendations designed to assist clinicians and health care systems in delivering effective tobacco dependence treatment (Table 1). More recently,

Table 1 | Key recommendations for guideline-based tobacco dependence treatment [11]

- 1) Tobacco dependence is a chronic disease that often requires repeated intervention and multiple attempts to quit.
- 2) It is essential that clinicians and health care delivery systems consistently identify and document tobacco use status and treat every tobacco user seen in health care settings.
- 3) Counseling and medication are effective when used by themselves for treating tobacco dependence. The combination of counseling and medication, however, is more effective than either alone. Thus, clinicians should encourage all individuals making a quit attempt to use both counseling and medication
- 4) Individual, group, and telephone counseling are effective, and their effectiveness increases with treatment intensity. Two components of counseling are especially effective, and clinicians should use these when counseling patients making a quit attempt: Practical counseling (problem solving/skills training) and Social support delivered as part of treatment
- 5) Telephone quitline counseling is effective with diverse populations and has broad reach. Therefore, clinicians and health care delivery systems should both ensure patient access to quitlines and promote quitline use.
- 6) Numerous effective medications are available for tobacco dependence, and clinicians should encourage their use by all patients attempting to quit smoking—except when medically contraindicated or with specific populations for which there is insufficient evidence of effectiveness (i.e., pregnant women, smokeless tobacco users, light smokers, and adolescents). Seven first-line medications (5 nicotine and 2 nonnicotine) reliably increase long-term smoking abstinence rates: Bupropion SR, Nicotine gum, Nicotine inhaler, Nicotine lozenge, Nicotine nasal spray, Nicotine patch, Varenicline.
- 7) If a tobacco user currently is unwilling to make a quit attempt, clinicians should use the 5 R's to increase motivation, which include
 - **Relevance**—Encourage the patient to indicate why quitting is personally relevant.
 - **Risks**—Ask the patient to identify potential negative consequences of tobacco use.
 - **Rewards**—Ask the patient to identify potential benefits of stopping tobacco use.
 - **Roadblocks**—Ask the patient to identify barriers or impediments to quitting.
 - **Repetition**—The motivational intervention should be repeated every time an unmotivated patient has an interaction with a clinician. Tobacco users who have failed in previous quit attempts should be told that most people make repeated quit attempts before they are successful.
- 8) Tobacco dependence treatments are both clinically effective and highly cost-effective relative to interventions for other clinical disorders. Providing coverage for these treatments increases quit rates. Insurers and purchasers should ensure that all insurance plans include the counseling and medication identified as effective in the guidelines

the National Comprehensive Cancer Network has published guidelines specifically for smoking cessation for patients with cancer [12]. These guidelines focused primarily on the adverse outcomes associated with continued smoking after the diagnosis of cancer, common barriers to smoking cessation, and simple, yet effective, assessment approaches. According to both of these published guidelines, the gold standard for tobacco treatment is to assess smoking status, provide advice to quit, offer assistance through pharmacotherapy and behavioral counseling, and reassess smoking status among former smokers [11].

Despite the fact that tobacco treatment doubles cessation rates, there has been low adoption in cancer care [13–15]. Emmons and colleagues [16] reported that only 55% of adult survivors of pediatric cancer who smoke received advice to quit and 36% discussed pharmacotherapy with their clinicians. Tobacco use is not systematically assessed in National Cancer Institute-designated comprehensive cancer centers. Goldstein and colleagues [17] reported that 58.6% of comprehensive cancer centers have an internal program, whereas 20.7% reported resources within their health systems, and 20.7% reported that no services were available. As a result, a large proportion of smokers do not receive assistance with cessation [14, 18, 19].

Although there are limited data on the implementation and effectiveness of smoking cessation programs within cancer care settings, several

studies have been published in other areas of clinical practice. Duffy and colleagues [20] tested the effectiveness of the Tobacco Tactics Program in five community-based hospitals in Michigan. Three of the hospitals received the Tobacco Tactics Program and two hospitals received usual care. Components of the Tobacco Tactics Program included a nurse delivered tobacco treatment intervention, a tobacco use documentation template, standardized teaching materials, and protocols to provide behavioral counseling and pharmacotherapy. Results from this study demonstrated significant improvement in the pre- to post-intervention self-report quit rate (4.3% vs. 8.0%, $p < .05$) among the intervention sites compared to no change in the usual care sites. In another study, Winickoff and colleagues [21] tested the implementation of a system-level tobacco treatment intervention for parents of pediatric patients in 20 community-based practices in 16 states. The intervention group practice sites received clinician training in delivering tobacco treatment to the parents, had templates for documenting tobacco use, standardized teaching materials, decision aides to assist with prescribing pharmacotherapy, and an integrated referral system for telephone based behavioral counseling. Results from this study indicated that the rate of delivering tobacco treatment improved in the intervention group (42.5%) as compared to the usual care group (3.5%) ($p < .0001$).

There are limited data on the implementation of tobacco treatment in community-based cancer

programs where most cancer patients are treated. Seventy percent of patients were diagnosed and/or treated within the American College of Surgeons, Commission on Cancer (CoC) accredited programs [22]. The CoC is a consortium of professional organizations that are dedicated to improve the quality of cancer care through (a) setting standards to ensure quality, multidisciplinary, and comprehensive cancer care, (b) conducting surveys to assess adherence to these standards, (c) collecting data to monitor outcomes, and (d) implementing educational programs to improve outcomes [23]. Accreditation by the CoC

demonstrates a cancer program's commitment to provide high quality, patient-centered care. As part of the accreditation process, cancer centers are reviewed and then assigned into one of nine categories based on the type of facility, number of cases seen in the facility each year, the type of services provided, and the program structure (Table 2). Although the CoC accredits all types of cancer centers, including, as of 2017, almost all of the NCI-designated comprehensive cancer centers, the majority of CoC-accredited programs are community centers. Therefore, the CoC accreditation program provides a framework and

Table 2 | Cancer program categories designated by the commission on cancer

Category ^a	Definition	% of programs
Comprehensive Community Cancer Program	500 or more newly diagnosed cancer cases seen each year. Has full range of diagnostic and treatment services provided either on-site or by referral. Participates in cancer-related clinical research by enrolling patients in cancer-related clinical trials or referring patients for enrollment at another facility	41%
Community Cancer Program	More than 100 but fewer than 500 newly diagnosed cancer cases are seen each year. Full range of diagnostic and treatment services provided but referral for a portion of diagnosis or treatment may occur. Participates in cancer-related clinical research by enrolling patients in cancer-related clinical trials or referring patients for enrollment at another facility	30%
Academic Comprehensive Cancer Program	Provides postgraduate medical education in at least four program areas, including internal medicine and general surgery. More than 500 newly diagnosed cancer cases seen each year. Has full range of diagnostic and treatment services provided either on-site or by referral. Participates in cancer-related clinical research by enrolling patients in cancer-related clinical trials or referring patients for enrollment at another facility	13%
Integrated Network Cancer Program	No minimum caseload needed for this category. Owns, operates or leases or is part of a joint venture with multiple facilities providing integrated cancer care and offers comprehensive services. At least one facility is a hospital and all facilities are CoC-accredited cancer programs. Characterized by a unified cancer committee, standardized registry operations with a uniform data repository and coordinated service locations and practitioners. Each entity meets performance expectations for the quality measures under the umbrella of the integrated program. Participates in cancer-related clinical research by enrolling patients in cancer-related clinical trials or referring patients for enrollment at another facility	7%
Veteran's Affairs Cancer Program	No minimum caseload needed for this category. Provides care to military veterans. Full range of diagnostic and treatment services on-site or by referral preferably to CoC-accredited cancer programs. Participates in cancer-related clinical research by enrolling patients in cancer-related clinical trials or referring patients for enrollment at another facility	4%
NCI-Comprehensive Cancer Center Program	No minimum caseload need for this category. Secures a NCI peer-reviewed cancer center support grant and is designated a Comprehensive Cancer Center. Full range of diagnostic and treatment services provided and staff physicians are available. Participates in basic and clinical research.	2%
Pediatric Cancer Program	Facility provides care only to children or the pediatric oncology program is a component within a larger CoC-accredited facility. Offers the full range of diagnostic or treatment related services either on-site or by referral. Facility is required to participate in cancer-related clinical research focused on pediatric patients either by enrolling in cancer-related clinical trials or referral to another facility.	1%
Hospital Associate Cancer Program	100 or fewer newly diagnosed cancer patients seen each year. Limited range of diagnostic and treatment services available on-site. Other services are available by referral. Clinical research is not required.	1%
Free Standing Cancer Center Program	No minimum caseload for this category. Facility is a nonhospital based program and offers at least one cancer-related treatment modality. Full range of diagnostic and treatment services is available by referral. Referral to CoC-accredited cancer programs is preferred. Participation in cancer-related clinical research is encouraged but not required.	1%

^aCategories for cancer programs were obtained from American College of Surgeons website <https://www.facs.org/quality-programs/cancer/coc/apply/categories>.

infrastructure to evaluate tobacco cessation programs in community practice.

This pilot study is the first to examine how tobacco treatment is implemented within the U.S. community-based cancer programs using the CoC as a sampling frame. The aims were to: (a) describe the extent of implementation of tobacco treatment and (b) determine the organizational delivery of tobacco treatment (measured by the presence of goals to address smoking, leadership support, and integration of guidelines) within CoC-accredited programs in the Northeast region (Connecticut, Massachusetts, Maine, New Hampshire, and Vermont) of the USA.

METHODS

This study was reviewed and deemed exempt by the institutional review board at Dana-Farber Cancer Institute. A list-based sampling frame was used to identify the target population for the survey. A list of e-mail addresses for the Chairs of the Cancer Committee for each cancer program was obtained through the CoC. This is one of the most common methods of conducting e-mail based surveys, especially within organizations where e-mail lists are available [24]. A letter of support from the CoC was sent to the Chair of the Cancer Committee asking each site to participate in the study. The Chair of the Cancer Committee oversees CoC activities thus were asked to identify the best person within the cancer program to provide information for the study.

Data collection

Data were collected by a one-time survey that was completed by e-mail, telephone, or mail (respondent choice). An initial invitation was sent from study staff followed by an additional invitation from the Chair of the CoC requesting survey completion. The eligibility criterion for completing the survey was that the cancer program had to be accredited by the CoC. Survey completion indicated consent. Respondents received a nominal \$25 gift card for their time.

The survey included data about characteristics of respondents (gender and role within the cancer program), the number of clinical staff, office staff, and whether an electronic health record (EHR) captured smoking status. A modified Assessment of Chronic Illness Care (ACIC) questionnaire was used to collect data about tobacco treatment services. The original ACIC collected data related to general office changes that were reflective of chronic illness and were not specific to tobacco treatment [25]. Winickoff and colleagues [26] adapted the ACIC questionnaire based on extensive interviews with leaders in the field of implementing practice change, existing Public Health Service tobacco treatment guidelines, and the Chronic Care Model. A national advisory group and steering committee assisted with

changes in the items and content validity was established through consensus approval. This questionnaire has been used in previous studies examining the implementation of tobacco treatment [21, 27].

The revised items examined to what extent the cancer program provided tobacco services and were developed based on the United States Public Health Service tobacco treatment guidelines and the original questionnaire items [11]. The items were related to what extent the cancer program provided: (a) a method of identifying and documenting tobacco status; (b) self-help cessation support; (c) community linkages such as referral to quitlines; (d) decision-aids for prescribing pharmacotherapy; and (e) re-evaluation of smokers' goals. Once smokers commit to a quit attempt, providing tobacco treatment to assist with the quit attempt and then re-evaluating the outcome of the quit attempt is an essential part of evidence-based tobacco treatment. Re-evaluation of smokers' goals should be done at each follow-up after a recent quit attempt [11].

Additional items that were part of the original questionnaire were adapted to measure the organizational delivery of tobacco treatment (version 3.5), which included the following components; (a) *presence of goals for addressing patient smoking* within the cancer program, which was defined as tobacco (as opposed to another chronic condition) was identified as a clear institutional goal that was measured, evaluated on a regular basis and the results incorporated into quality improvement plans, (b) *leadership support* was defined as ensuring that leaders within the cancer program were committed and visibly participated in tobacco treatment improvement efforts, and (c) *integration of guidelines* was defined as guidelines were available in the clinical setting, integrated into care, and supported by education. The framing of the questions, scoring algorithm, and rating categories of the modified scale were kept the same as the original questionnaire.

The items consisted of Likert-type scale items scored from 0 to 11 and were defined as (a) "No extent/Limited support for tobacco treatment" when cancer program respondents scores were between "0-2"; (b) "Basic support for tobacco treatment" when scores were between "3-5"; (c) "Reasonably good support for tobacco treatment" when scores were between "6-8"; and (d) "Optimal and fully developed tobacco treatment" when scores were between "9-11". The mean score on each item provides information about areas that need improvement. A mean score of 9 represented optimal delivery of tobacco treatment within the organizational setting.

Statistical analyses

Descriptive statistics, means, standard deviations, and percentages were computed for all programs.

The means were calculated from the survey and ACIC individual item scores. Data were analyzed using STATA version-13.

RESULTS

Sample

One hundred and two sites were potentially eligible, of which 17 were unable to be contacted due to incorrect information, the contact moved to another location or the program was no longer accredited. Twenty-eight of 85 sites participated (response rate of 33%). Twenty-seven (96%) of responding programs were community-based and one was an NCI-designated comprehensive cancer center. The respondents were mostly female and evenly distributed between physicians and others (Table 3).

Extent of implementation of tobacco treatment

Most programs (78.6%) had an EHR and of these 68% captured smoking history. Implementation of tobacco treatment is described in Table 4. An optimal approach to identify and document tobacco use was present in 39% of programs, and 32% had an optimal approach (score of 9 or greater on the scale) to link smokers with community-based resources. Referral to quitlines and websites were the most common resources (Table 5).

The least developed areas regarding implementation were providing self-help cessation materials (25% were optimal), using decision-aids to support prescribing pharmacotherapy (25% were optimal),

and re-evaluating smokers' goals (7% were optimal). The most common self-help cessation materials included; written materials followed by education programs.

Organizational delivery of tobacco treatment

The organizational delivery of tobacco treatment was limited within these programs (Table 6). Four percent of programs had optimal goals (scores of 9 or greater on the scale) for addressing patient smoking, 18% had optimal leadership support, and 7% had optimal integration of guidelines into their delivery system.

DISCUSSION

This was the first study that evaluated the implementation of tobacco treatment in CoC-accredited programs, largely representing community-based care. The study demonstrated that most programs do not have comprehensive institutional programs to identify cancer patients who smoke and systematic tobacco cessation treatment. Tobacco treatment guidelines recommend that clinicians document tobacco use and offer treatment to every smoker seen in healthcare settings [11]. However, in this study only 68% routinely captured smoking within the EHR, even though about 80% had an EHR. This is a missed opportunity as the benchmark set for the screening of tobacco use as part of the meaningful use criteria is 80% [28].

The use of decision aides for pharmacotherapy and reassessment of smoking status were the least

Table 3 | Characteristics of participants and cancer programs (n = 28)

	N (%)	Mean (SD)	Median (range)
Participants			
Female	20 (71.5.0)		
Male	6 (21.43)		
Chair of the cancer committee	11 (39.0)		
Physician	14 (50.0)		
Other ^a	13 (46.4)		
Cancer treatment programs			
Number of clinical staff		38.85 (59.5)	15 (1–250)
Number of office staff		30.73 (76.7)	10 (1–400)
Number of analytic cancer patients program seen per year ^b		1893.60 (2156.9)	1300 (100–10,000)
Type of cancer program ^c			
Academic teaching center	3 (10%)		
NCI-Comprehensive cancer center	1 (4%)		
Comprehensive community center	14 (50%)		
Community center	10 (36%)		
Electronic health record			
Programs with electronic health records (EHR)	22 (78.57)		
Smoking routinely captured in EHR	15 (68.2)		

Totals may not equal 100% due to missing values.

^aOther includes Cancer Registrar, Certified Tumor Registrar, Clinical Director, Clinical Research Nurse, Nurse Navigator, Oncology Nurse Navigator, Oncology Nurse Navigator, and Psychologist.

^bThe number of cancer patients seen/year was asked as a self-report question on the survey.

^cClassifications for type of center were obtained from the American College of Surgeons website (<https://www.facs.org/search/cancer-programs>).

Table 4 | Descriptive statistics of the extent of tobacco treatment services implementation in cancer treatment programs (*n* = 28)

The extent of TTS implementation	Mean (SD)	Not at all (Score 0–2)	Very little (3–5) Basic	To some extent (6–8) Good	To a great extent (9–11) Optimal
Identifying and documenting tobacco use	7.28 (2.95)	7.14%	10.71%	42.86%	39.29%
Use self-help materials for smoking cessation	6.78 (2.65)	3.57%	21.43%	50.0%	25.0%
Link tobacco users to outside resources (smoking quitline)	6.78 (2.97)	10.71%	14.29%	42.86%	32.14%
Decision aids for TT pharmacotherapy	4.96 (3.26)	21.43%	39.29%	14.29%	25.0%
Prompt follow-up and periodic re-evaluation of smokers' goals ^a	3.37 (2.84)	44.44%	33.33%	14.81%	7.41%

EHR Electronic Health Records; TTS Tobacco Treatment Services.

^a*n* = 27.

Table 5 | Self-help materials/community services used by programs for cessation support

Type of material/services	N (%)
Written materials	22 (78.5)
Videos/DVDs	4 (14.2)
Computer software	1 (3.5)
Education in your hospital	17 (60.7)
The hospital's website	10 (35.7)
Internet websites	14 (50.0)
Referral to state telephone quitlines	16 (57.0)
None	1 (3.5)
Other	6 (21.4)

Other includes: ACS material, ACS Hotline, Tobacco treatment counselor, referral to pulmonologist for smoking cessation counseling and pharmacotherapy, referral to nurse navigator to help refer patient appropriately, written materials for tobacco helpline

developed and need to be targeted for improvement. These findings are consistent with other studies that have shown that oncology clinicians assess tobacco use at the initial visit and offer advice to quit, but provide little assistance through the use of pharmacotherapy [13]. Common barriers cited for the lack of implementation of tobacco treatment were lack of knowledge and need for additional training [13]. Evidence suggests that the use of EHR alone is not adequate to increase screening and treatment [29]. More effective is the integration of a system-level intervention that provides education and decision support to clinicians, which has been shown to have a 12-fold increase in delivery of tobacco treatment [21].

Guidelines for tobacco control implementation have been in existence for over a decade but integration into practice remains less than optimal in cancer programs [17]. Effective strategies for integrating guidelines into practice include focusing on system-level interventions and having leadership visibly support efforts and policy-level interventions [30, 31]. System-level change describes specific strategies that healthcare administrators can implement to treat tobacco dependence. These strategies include implementing a tobacco-user identification

system, providing training, resources, and feedback about delivering evidence-based treatment, dedicating staff to provide tobacco treatments and assessing delivery of treatment in staff performance evaluations and promoting hospital policies that support and provide tobacco treatment services [1]. However, implementation across a community-based practice system may not be simple. This requires collaboration and coordination of the hospital and a number of independent practices where most patients receive follow-up care. Practical solutions to this problem may involve creating an infrastructure that provides education so that clinicians can deliver evidence-based tobacco treatment as part of routine care and/or having a system-wide standardized referral system for tobacco treatment [20, 21, 32]. Another potential solution is that since many small practices often do not have sufficient bandwidth and resources to fully implement these guidelines establishing a collaborative relationship with their affiliated larger institutions could serve to reach more individuals. This study is the first to demonstrate the degree to which this has occurred. System-level interventions combined with the CoC infrastructure to monitor the quality of care and provide feedback to organizations to improve their performance has the potential to greatly enhance the delivery of tobacco treatment to cancer survivors and improve clinical outcomes [22, 33]. The CoC infrastructure provides support to accredited programs through the use of reporting tools to aid in benchmarking as well as participation in research, educational opportunities, and developmental resources to improve the quality of care and patient outcomes. The addition of policy-level interventions such as mandating tobacco treatment as a requirement for accreditation is another potential strategy to increase optimal implementation [34].

Limitations

This study used the sample framework of the CoC but because of the major penetration of the CoC in oncology practice it likely reflects the status of tobacco control programs in the U.S. oncology

Table 6 | Organizational delivery of tobacco treatment (n = 28)

Organizational delivery of TT variables	Mean (SD)	Limited ^a (0–2)	Basic (3–5)	Good (6–8)	Optimal (9–11)
Program goals for addressing patient smoking are	5.03 (2.33)	7.14%	60.71%	28.57%	3.57%
Senior leadership provides support for tobacco treatment	5.89 (2.75)	17.86%	21.43%	42.86%	17.86%
Tobacco treatment guidelines in place	5.82 (2.70)	10.71%	32.14%	50.0%	7.14%

^aThe ACIC was used to measure the organizational delivery of tobacco treatment and is organized such that the highest score (“11”) indicates optimal support for tobacco treatment. The percent represents the percentage of programs that had scores within this category.

practice. A limitation of this study was that we used one respondent per organization rather than a multi-respondent approach. Numerous researchers have called for the use of multiple respondents rather than only one in organizational research, especially in the context of tobacco treatment [35, 36]. Having multiple respondents per organization enables the researcher to identify varied opinions about the particular topic and provides an opportunity to have convergence of the data or identify areas of differences. However, our findings are similar to the study conducted by Goldstein and colleagues [17] who also identified that the delivery of tobacco treatment services was not optimal within NCI-designated comprehensive cancer centers. Other limitations of this study included a response rate of 33%, close to the rate of 35% that has been identified as adequate in organizational studies [37]. The response rate was likely affected by the fact that the survey targeted executive-level employees who tend to have lower response rates compared to non-managerial employees [38]. Further the data were self-reported. In addition, the participating cancer programs were relatively large with a median of 1,300 cancer patients annually (nationally the median size among CoC programs is about 650). Larger programs may tend to have more resources than smaller programs, highlighting the significant opportunity for improvement in tobacco treatment. Future work should include using multiple respondents to assess tobacco treatment, objective measures of clinician performance, and assessment of patient outcomes related to delivery of tobacco treatment services. Finally, collecting data on the characteristics of patients seen within the cancer centers that participated in this study was not collected since this was outside the scope of the present study. Evidence exists for the fact that the prevalence of tobacco use and uptake of tobacco treatment interventions varies by race, ethnicity, and socioeconomic status [39, 40]. To date, few studies have examined the impact of demographics and response to tobacco treatment within the context of cancer [41]. Future studies should collect this type of information so that the effectiveness of tobacco treatment among various racial and ethnic groups can be evaluated. This information would identify whether tobacco treatment interventions for cancer patients need to be culturally tailored. Evidence from the general population suggests that culturally tailored intervention

may enhance the uptake of the tobacco treatment and smoking abstinence rates but further studies are needed [42, 43].

CONCLUSIONS

Many U.S. cancer programs have not implemented systems to deliver optimal tobacco treatment. Efforts should be made to help cancer programs develop sustainable system-wide programs that will address the urgent need to deliver tobacco treatment to all cancer survivors.

Ethical Approval: This study was exempt by the Institutional Review Board at Dana-Farber Cancer Institute. This article does not contain any studies with animals performed by any of the authors.

Informed Consent: This study was submitted to the institutional review board and was deemed exempt. Letters were sent to executives at the organization requesting completion of the survey. Completion and return of the survey indicated consent to participate in the study.

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Compliance with Ethical Standards

Conflict of Interest: The authors have no competing interests to disclose.

Primary Data: The findings reported in this manuscript have not been previously published and the manuscript is not being simultaneously submitted elsewhere. The data presented in this manuscript has not been previously reported. The authors have full control of all primary data and they agree to allow the journal to review their data if requested.

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