Implementing Tobacco Use Treatment Guidelines in Public Health Dental Clinics in New York City


Abstract: In this study we evaluated the effect of a multicomponent intervention to implement the Public Health Service (PHS) guideline *Treating Tobacco Use and Dependence* in six randomly selected dental clinics in New York University's College of Dentistry. The main outcome measure—provider adherence to tobacco use treatment guidelines—was assessed by auditing a random selection of patient charts pre (698) and post (641) intervention. The intervention components included a chart reminder and referral system, free nicotine replacement therapy (NRT), and provider training and feedback. The results showed that rates of screening for tobacco use did not change between pre and post test chart audits. However, providers were significantly more likely to offer advice (28.4 percent pre, 49 percent post), assess readiness to quit (17.8 percent pre, 29.9 percent post), and offer assistance (6.5 percent pre and 15.6 percent post) in the post test period. Increases in NRT distribution were associated with booster training sessions but declined in the time periods between those trainings. Research is needed to further define sustainable strategies for implementing tobacco use treatment in dental clinics. The results of this study suggest the feasibility and effectiveness of using a tailored multicomponent approach to implement tobacco use treatment guidelines in dental clinics.

Dr. Shelley is Clinical Associate Professor, Department of Cariology and Comprehensive Care, New York University College of Dentistry; Ms. Anno is Project Coordinator, New York University School of Medicine; Ms. Tseng is Junior Research Scientist, Department of Cariology and Comprehensive Care, New York University College of Dentistry; Dr. Calip is Postdoctoral Fellow, Fred Hutchinson Cancer Research Center, University of Washington; Mr. Wedeles is Research Associate, Department of Prevention and Community Health, George Washington University School of Public Health and Health Services; Ms. Lloyd is Practice Director of New York University College of Nursing Faculty Practice; and Dr. Wolff is Professor and Chair, Department of Cariology and Comprehensive Care, New York University College of Dentistry. Direct correspondence and requests for reprints to Dr. Donna Shelley, New York University College of Dentistry, 380 Second Ave., New York, NY 10010; 212-992-7013 phone; 212-995-4912 fax; ds186@nyu.edu.

This research was supported by a grant from the New York State Department of Health Tobacco Control Program.

Keywords: smoking cessation, tobacco use treatment, guideline implementation introduction, dental practice, dental education, public health, dental clinics

Submitted for publication 7/23/10; accepted 10/29/10

According to the 2008 Public Health Service (PHS) guideline *Treating Tobacco Use and Dependence*, there is strong evidence that screening, brief counseling, and pharmacotherapy can produce significant and sustained reductions in tobacco use.¹ Dental practices are an important venue for delivering effective tobacco use interventions, particularly in view of the oral hazards of tobacco use and the links between oral pathology and systemic health. Additionally, dental care offers opportunities to identify and engage at-risk individuals who are otherwise unlikely to receive preventive care services. An analysis of data from the 2005 National Health Interview Survey demonstrated that, among individuals at risk for HIV, 50 percent who had not visited a physician in the prior year had visited an oral health provider during that same period.²

Studies have demonstrated the efficacy of dental office-based interventions; however, adoption of tobacco cessation guidelines in dental practices remains low.³,⁴ A population-based sample of dentists and dental hygienists in New York State found that only 12 percent of dentists and 21 percent of dental hygienists provided tobacco use counseling as part of routine dental care.³ Similarly, a survey of dentists in Texas found that less than 20 percent spent three or more minutes per patient on counseling. In a recent national survey of dentists, 50 percent reported that
setting a quit date and referring patients to tobacco cessation clinics or programs was not a part of their practices for patients who use tobacco products.

Dentists cite several reasons for their reluctance to provide cessation interventions, including a lack of training, time, and financial incentives. However, a recent review of the literature found some promising approaches for encouraging adoption and implementation of tobacco cessation activities in dental care settings. These include academic detailing, training programs for dental hygiene, and use of statewide quitlines as an adjunct to dental office-based interventions.

In July 2008, the New York University College of Dentistry (NYUCD) implemented a multicomponent intervention to improve the quality of tobacco use treatment in its fourteen general dental clinics. As the largest safety net provider in New York State, this dental public health care delivery system has the potential to reach those populations most at risk for tobacco-related illnesses. The purpose of this article is to describe the impact of this intervention on provider adherence to tobacco use treatment guidelines.

### Methods

NYUCD is the single largest safety net provider of dental care in New York State. Annually, NYUCD clinics provide comprehensive oral care for approximately 85,000 outpatients (over 350,000 visits per year). Sixty percent of patients self-identify as either African American or Hispanic, 43 percent report being a high school graduate or less, 57 percent have Medicaid, and 42 percent are uninsured. Approximately 25 percent currently smoke cigarettes, a smoking prevalence that is 67 percent higher than the general New York City population (15.8 percent) and 19 percent higher than the general U.S. population.

The intervention was implemented in the fourteen comprehensive care general dentistry clinics within the school. Each clinic has approximately fifty third- and fourth-year students supervised by a general practice director and ten faculty members. Most patients are screened in the registration clinic prior to their visit to the general dentistry clinic. At the registration visit, students obtain a medical and dental history and conduct an oral exam. As part of these intake procedures, patients are screened for oral health-related risk factors including tobacco and alcohol use. This information must be obtained for all new patients; therefore, if patients bypass the registration visit and go directly to the general dental clinic, they will undergo the same screening procedures as they would have at registration.

We evaluated changes in documented adherence to the PHS guideline in a random selection of six of the fourteen clinics using a cross-sectional pre-test-post-test study design. Several clinic site visits and meetings with the clinic directors were held prior to developing the intervention protocol in order to tailor intervention components to current systems and existing patterns of care. For example, because there was no chart system to remind dental students to screen for tobacco use on the follow-up visit progress notes, we developed a chart stamp (Figure 1). The intervention components were adopted from previous studies of effective strategies for guideline dissemination and implementation.

### Intervention

**Chart system.** In 2005, NYUCD implemented a chart system that prompted students to screen for tobacco use at the initial visit. In addition, on the back of the intake form was a graphic adapted from the PHS guidelines that showed the recommended algorithm for addressing tobacco use at each patient encounter. In 2008, a chart stamp (Figure 1) was created to be used for follow-up visits. Unlike the intake form that was used for the initial visit, there was no preprinted prompt to screen patients on the progress notes that were used for follow-up visits. The purpose of the stamp was to provide a method for documenting assistance provided to current smokers including the provision of NRT and/or referral to a smoking cessation program or the New York State Smokers’ Quitline. Students were responsible for stamping all current tobacco users’ charts.

**Faculty and student training.** Faculty members who supervise students in the clinics were required to attend a one-hour training on the new tobacco use treatment protocol (i.e., use of chart stamp, NRT protocol, and referral resources). About one month before they began their clinical rotations (May 2008), second-year students attended a three-hour course that provided an in-depth review of the PHS guidelines and the NYU dental clinic protocol for treating tobacco use. In addition, we provided three twenty-minute booster trainings, in October/November 2008, February/March 2009, and June 2009, for third- and fourth-year students who staff the clinics. The booster trainings were conducted during monthly clinic meetings and reviewed the use
of the chart stamp, how to assess readiness to quit and eligibility for NRT, how to prescribe NRT, and how to refer patients to the quitline or a local tobacco cessation program.

**Nicotine replacement therapy.** Nicotine patches, gum, and lozenges were provided to the clinics by the Manhattan Tobacco Cessation Program (MTCP), a program funded by the New York State Department of Health (NYSDOH) Tobacco Control Program. The patch was available in 21 and 14 mg doses, and the lozenge and gum in 2 and 4 mg doses. The medication was packaged in two-week supplies. A protocol for prescribing NRT (i.e., dosing instructions) was posted at each clinic’s supply area, which is where students and faculty members were able to obtain the medication. Patients were able to obtain up to three two-week treatments of NRT for a total of six weeks of pharmacotherapy. The decision to offer a two-week supply of NRT was based on resource constraints and studies conducted by the New York State Smokers’ Quitline that demonstrated equivalent outcomes for two-, four-, and six-week courses of NRT distributed through the quitline.16,17 Patients were eligible for NRT if they were eighteen years or older, did not use smokeless tobacco, were not pregnant or breastfeeding, and reported being ready to quit in the next two weeks.

**Referral protocol and provider feedback.** All students and faculty members were given prescription pads that were preprinted with two referral sources: the New York State Smokers’ Quitline and the NYU Nursing Faculty Practice Smoking Cessation Program (Figure 2). Monthly reports showing NRT distribution by clinic were e-mailed to the general practice directors (i.e., directors of the dental clinics).

**Data Collection**

Charts from patients who had a dental visit during May 2008 (prior to the intervention) and in May 2009 (post intervention period) were randomly selected for review. We selected 140 charts per clinic to obtain a minimum of 100 evaluable charts.
per clinic. If charts were not available in the chart room and the number of evaluable charts did not meet the goal of 100, four additional attempts were made to obtain charts. If charts were not available by the fourth attempt, they were replaced with new randomly selected chart numbers until the goal of 100 was met.

A standardized chart review tool was used to collect data. The PHS guideline recommends a 5As approach, which consists of asking about tobacco use, advising patients to quit, assessing readiness, providing assistance, and arranging follow-up. In adapting the 5As model into the dental setting, we collapsed the fifth A (arrange) into assistance activities that included providing either NRT and/or a referral for additional counseling. Research assistants reviewed documentation of the PHS guideline and recommended 4As (ask, advise, assess, and assist) at the most recent visit in the patient chart. They also reviewed whether patients were screened for tobacco use at the initial patient visit.

Tracking sheets for NRT distribution were created and placed in the supply room where students obtain instruments and other materials needed for patient care. Students were required to go to this location to obtain NRT from the supply room supervisor. Prior to obtaining the medication, they completed the tracking form, which included the type of medication provided (e.g., patch vs. gum), the dose (e.g., 14 mg vs. 21 mg), and the patient’s name and chart number.

To assess patient cessation rates and use of NRT, we conducted telephone surveys among 115 patients who received NRT in the previous three to six months (November 2008 to February 2009). The protocol for follow-up assessments included five attempts to reach patients. Patients were considered abstinent if they reported that they had not smoked at all, even a puff, in the last seven days (seven-day point prevalence abstinence).

### Table 1. Documentation of 4As (ask, advise, assess, and assist) used with dental clinic patients, by percentage of patients in study

<table>
<thead>
<tr>
<th>Tobacco assessment measure for all patients</th>
<th>Pre (n=698)</th>
<th>Post (n=641)</th>
<th>p-value (Fisher’s exact test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask at first visit</td>
<td>96.0%</td>
<td>96.4%</td>
<td>.78</td>
</tr>
<tr>
<td>Ask at last visit</td>
<td>42.4%</td>
<td>41.5%</td>
<td>.74</td>
</tr>
<tr>
<td>Tobacco assessment measure for current smokers at last visit</td>
<td>Pre (n=169)</td>
<td>Post (n=147)</td>
<td>p-value (Fisher’s exact test)</td>
</tr>
<tr>
<td>Advise</td>
<td>28.4%</td>
<td>49.0%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Assess</td>
<td>17.8%</td>
<td>29.9%</td>
<td>.01</td>
</tr>
<tr>
<td>Assist (refer or prescribe)</td>
<td>6.5%</td>
<td>15.6%</td>
<td>.01</td>
</tr>
</tbody>
</table>

### Statistical Analysis

Analysis was carried out with SPSS 16.0 software. Frequencies were calculated for all variables (ask, assess, advise, and assist) at both baseline and follow-up. Each dichotomous variable was analyzed using the Fisher’s test to assess whether there was a significant difference between the percentages from baseline and follow-up. Two-tailed significance levels were set at $p \leq 0.05$.

### Results

A total of 698 patient charts were reviewed from the baseline period and 641 from the post intervention period. Smoking prevalence was similar at both time periods (24 percent pre and 23 percent post intervention). At the initial visit, over 95 percent of patients were screened for tobacco use (Table 1). This declined to just over 40 percent at the follow-up visit. There was no change in screening rates between the two study periods. In contrast, there was a significant increase in documentation of advice, assessment, and assistance (referral and prescription) from the baseline to the post intervention period.

Figure 3 shows the amount of NRT distributed across the six clinics. From August 2008 to August 2009, a total of 225 courses of NRT were distributed. A total of 860 two-week courses of NRT were distributed across all fourteen clinics during that period. Fifty patients received more than two weeks of medication. NRT distribution showed some seasonal changes in December and August, during which the clinics close for two weeks. In addition, the peaks in prescribing during November, March/April, and again in July 2009 correlated with booster trainings. In subsequent months (data not shown), the NRT distribution across all clinics plateaued at approximately thirty to forty courses per month.
We reached thirty-five of the 115 smokers who had received NRT in the previous three to six months (30 percent response rate). Three patients refused to complete the survey, twenty were wrong numbers, and fifty-two did not answer the phone. Of the thirty-five patients reached, five (14 percent) reported abstinence.

Discussion

We found that a multicomponent systems approach to improving smoking cessation services (including staff education, chart reminders, and free NRT) increased adoption and implementation of tobacco use treatment guidelines in dental public health clinics. The importance of reminder systems to facilitate quality improvement was made evident by the discrepancy between screening rates at initial and follow-up visits. The charts used for the initial visit prompted providers to ask about tobacco use, but on follow-up visits charts lacked this prompt. The stamps that students were told to use at follow-up visits were ineffective for several reasons. Students were required to remember to ask about tobacco use (i.e., there was no prompt) and then had to go to the administrator’s desk to obtain the stamp. In fact, our chart review revealed only two charts, among the over 1,200 audited, that were stamped.

The clinics’ approach to addressing the lack of improvement in screening was to implement a new stamp that is required to be used for every patient and includes other quality improvement initiatives. Although a chart reminder already embedded in the charting system is preferable, as part of this new policy, faculty will not sign off on students’ charts unless the stamp in present and filled out. The experience with the chart stamp emphasizes a need for continuous observation, evaluation, and adaptation during the quality improvement process to ensure that new policies, systems, and procedures are both adopted and implemented effectively. Training and booster sessions appeared to have an effect on guideline adherence as measured by the NRT distribution, which peaked after each training period. However, there was a decline after each training and more recently a flattening of NRT allocation. Provider education has generally been studied as part of multifaceted interventions resulting in modest improvements in process of care. However, there is no data on the sustainability of provider training as an
implementation strategy or information on how often retraining is needed to maintain quality improvement. In clinics staffed with large numbers of students and other levels of trainees, repeated educational sessions and reinforcement by faculty supervisors is likely a necessary component. In addition, institutionalizing the guideline implementation process through standard policies and procedures and creating a flexible quality improvement environment that is responsive to audits and feedback may be more likely to sustain practice changes. Further research is needed to determine those factors that can ensure the maintenance of implementation efforts in dental clinical settings.

In contrast to the issue of sustainability, factors that influence the adoption and implementation of evidence-based practices have been studied in more depth. These factors include organizational readiness or capacity to change, an implementation infrastructure to optimize dissemination, and an innovation (in this case the PHS guideline) that is compatible with current practice, available for trials, and adaptable to suit the needs of the user’s group. Many of these factors were in place at NYUCD, including an adaptive organizational structure, a cohesive group of practices that prioritize quality, strong leadership, resources dedicated to quality improvement, and well-defined internal communication systems including feedback mechanisms and methods for monitoring goals.

In addition, the implementation strategies were evidence-based (e.g., chart reminders) and tailored to overcome potential barriers to implementing the guidelines in the unique environment of the NYUCD clinics. For example, during booster trainings students continued to express a lack of confidence in choosing a dose of NRT, which led us to develop a table that simplified prescribing information and was posted at the supply room and on the NRT tracking sheet. Another example of adapting the intervention to the site was the provision of free NRT. Students are unable to prescribe medications, yet pharmacotherapy is associated with significant increases in cessation rates. There is also evidence that reducing or eliminating the cost of NRT increases a smoker’s willingness to engage in a quit attempt. For both of these reasons we developed a system to distribute free NRT. This addressed both provider- and patient-level barriers to using pharmacotherapy and resulted in over 1,000 courses of NRT being distributed to date—which, based on the smoking prevalence in the clinics, is approximately 6 percent of all NYUCD clinic patients who smoke.

Overall, our results compare favorably with other studies that have used a similar approach in dental public health clinics. For example, a study reported increases in patient reports of provider adherence and tobacco abstinence in dental public health clinics that received provider training and free NRT. Although there is increasing empirical evidence for dental office-based interventions to implement tobacco cessation in dental clinics, most of the previous studies have taken place in private practices. Yet, the highest risk populations are more likely to be found in public health clinics. In this study, we found smoking rates over 20 percent compared to 15.8 percent for the general population in New York City. This is consistent with national data demonstrating that smoking prevalence is highest among low-income Americans who are more likely to obtain care in public health clinics. Based on our findings and previous research in dental settings, by providing brief advice and NRT we can estimate a six-month quit rate of 10 to 18 percent. Applying these estimates to the number of patients who between 2008 and 2009 received brief intervention and NRT in NYUCD’s fourteen dental clinics (860), there would be eighty-six to 155 fewer smokers per year. Even with modest cessation rates, the impact of effectively disseminating tobacco cessation guidelines throughout the dental public health system, including federally qualified health centers (FQHCs), would be significant.

Turning to limitations, the NYUCD clinics are staffed primarily by students under faculty supervision. Therefore, the results may not be generalizable to FQHCs. In addition, we were able to provide free medication through a state-funded program, which may not be feasible for other settings. However, dental clinics can assist patients in obtaining medication through Medicaid programs, which cover pharmacotherapy for cessation in thirty-eight states, and by linking patients with state quitlines, many of which offer free medication. Of note, since this study began, the NYSDOH has discontinued the free NRT program, but NYUCD leadership has committed funds to continue to provide this resource. Another limitation is the pre-post nonrandomized design and lack of control group, which does not account for potential secular changes that might have explained the findings. However, no other initiatives regarding tobacco use were ongoing outside of this project.

Finally, although our primary outcome of interest was a change in provider practice patterns, we did attempt to assess patient-level outcomes among patients who...
received NRT. However, the low response rate may limit our ability to accurately assess the effect of the program on three-to-six-month cessation rates.

Conclusion

Dental visits at public health clinics are underutilized opportunities to intervene with a patient population that has disproportionately high rates of tobacco use. The results of this study are promising and suggest that multilevel system changes are feasible in busy urban public dental health clinics and offer opportunities to effectively address tobacco use in these sites. Further research is needed to study implementation strategies in public dental health care settings and to ensure sustainability of practice improvements in these settings.

REFERENCES


