

RESEARCH STRATEGY

A. Overall Aims & Objectives

The proposed study “Evaluating a Dental Tobacco Cessation System (DTCS) for Post-Doctoral Dental Trainees” will develop and evaluate a customized training tool that uses a highly engaging, web-based tool to increase the tobacco cessation practice behaviors of dental graduates at the beginning of their post-doctoral training. Guided by the Social Cognitive Theory (SCT) (Bandura, 1986) DTCS utilizes various technologies including an online course guide, interactive videos, and simulated patient interactions. The self-efficacy construct as described in the SCT theory, refers to one's perception of one's ability to perform a task. People tend to engage in activities in which they feel confident and competent avoiding those in which they do not. Trainee's self-efficacy for tobacco cessation counseling is correlated with their clinical performance. A key goal of the DTCS program is to assist the trainee to provide more complete information about tobacco cessation for their clinical practice by providing them with information as well as opportunities to practice new skills. The goal of the DTCS is to develop competency in tobacco cessation in the early stages of a clinical career in order to establish tobacco cessation as a routine practice behavior.

The educational systems in place for tobacco cessation are usually in classroom lecture format only and therefore do not resonate with the trainee's clinical experiences (Albert et al., 2009). The result has been an inconsistent and often insufficient message being provided to dental clinicians during the crucial formative stage of their careers. This may lead to poor self-efficacy with tobacco cessation interventions. To more effectively disseminate the USPHS 5A's for dental trainees the Dental Tobacco Cessation System (DTCS) was developed. The DTCS utilizes an innovative information technology program to provide didactic information supported with by an online clinical experience. It features exercises that culminate with virtual patients and clinical decision-making to establish self-efficacy and a strong clinical competency in tobacco cessation.

Education in post-doctoral dental programs is based on the concept that oral health is an integral part of total health. The programs are designed to expand the scope and depth of the graduates' knowledge and skills to enable them to provide comprehensive oral health care to a wide range of population groups. Practice patterns, professional socialization, and patient/clinician interactions that are developed and fostered during the post-doctoral training program establish the foundation for future practice.

The DTCS program was initially designed for use with pre-doctoral dental students. The DTCS Training Tool will be modified and tailored for use by post-doctoral dental directors and trainees to increase the adoption of the USPHS 5A's by dental clinicians. The program provides features information on the oral effects of tobacco use, how to conduct tobacco cessation counseling, and how to select an appropriate pharmacotherapeutic regimen to assist with a quit attempt. This is facilitated by various technologies including an online course guide, interactive videos, and simulated patient interactions. Accredited programs in dental post-doctoral education include pediatric dentistry, prosthodontics, orthodontics, periodontics, oral surgery and general dentistry (general practice residencies and advanced education in general dentistry programs). The clinical emphasis of each of these programs varies considerably.

Tailoring of DTCS to the individual post-doctoral program is anticipated to be necessary. This project will commence with the recruitment of 10 post-doctoral program directors from five program categories. A focus group will be convened for each of these post-doctoral categories to obtain information to tailor a teaching manual for each group. The program will then be pilot tested and evaluated. Trainees will receive the DTCS curriculum in face-to-face sessions and will also be instructed to take the online curriculum modules, which will then be followed by two sessions to reinforce the patient assistance module. A 3-month post survey will be utilized to assess trainee and director change in knowledge, behaviors and attitudes around tobacco cessation.

The aims of this study are to:

1. Identify dental post-doctoral and residency program dental directors for participation in focus groups to evaluate the DTCS.
2. Develop tailored DTCS modules for use by post-doctoral training and residency programs.
3. Develop customized teaching manuals for each post-doctoral training and residency program.
4. Finalize intervention design and content.
5. Evaluate the customized training modules in post-doctoral training programs.

In summary, the proposed project is: **significant** in that, if found to be successful, a DTCS such as the one proposed, could enhance adoption of the USPHS 5A's guidelines by post-doctoral trainees and residents; **innovative** because it uses a web-based interactive and customized platform to directly address inadequacies in tobacco cessation education for dentists; uses a sound scientific **approach** that is based on previous research; and brings together an experienced team of **investigators** in an **environment** that is uniquely suited to the successful completion of the project.

B. Current Assessment of Need in Target Area

Evidence based tobacco cessation guidelines (the 5 A's: Ask, Advise, Assess, Assist and Arrange) when used by clinicians are effective in reducing tobacco use and obtaining successful quits by patients (Fiore et al., 2008). These guidelines are consistent with the broad preventive message already provided in dental offices. Numerous investigations, and our own work with dentists, provide evidence that clinician behaviors with regard to the 5 A's can be achieved with dental providers in a clinical setting (Warnakulasuriya, 2002, Albert et al., 2002, Albert et al., 2005, Gordon et al., 2006, Gordon et al., 2007, Gordon et al., 2010). Dentists have been encouraged by organizations including the American Dental Association, the Centers for Disease Control and the United States Public Health Service to provide tobacco cessation instruction and intervention in the dental office (Tomar, 2001). Dental health care providers have a unique opportunity to provide tobacco cessation counseling for their patients, as a result of frequent office visits as well as the ability to directly relate the impact tobacco use has on oral tissues (Gordon, et al., 2009, Pendharkar et. al., 2010). Smoking cessation advice from

health care professionals increase quit rates and 40% of smokers have been found to attempt to quit after receiving advice from their healthcare provider (Hu, et al., 2006)

B.1. Dentist's Role in Identifying Tobacco Use and Providing Cessation Advice

It is important that dental clinicians provide a consistent and firm message to their patients that smoking can be stopped. Clinicians should provide information on how to quit and suggest pharmacotherapeutics to assist the nicotine dependent patient in quitting. The USPHS guideline, "Treating Tobacco Use and Dependence", was developed to provide clinicians with evidence based recommendations for assessment and treatment of tobacco dependence (Fiore et al., 2008). The key recommendations made by this document are summarized in five steps referred to as the 5 A's. The 5 A's are: 1) ASK - Identify and flag tobacco users, 2) ADVISE – Give direct advice to quit, 3) ASSESS – Is the patient ready to quit, 4) ASSIST – Help patients to quit, using behavioral and pharmacological approaches, and 5) ARRANGE – Provide follow-up contact and encouragement.

Although the majority of U.S. dentists (89%) see tobacco cessation intervention as an important professional responsibility (Tong et al., 2010), a recent study reported that only 21% of dentists were aware of the USPHS guideline for tobacco cessation or had tobacco cessation training (Tong et al., 2010). Dental schools are not providing sufficient didactic and clinical education to establish tobacco cessation as a routine part of daily practice. While professional practice routines can be changed, it requires new learning experiences, which are supported by behavior modeling and the opportunity to practice new skills.

B.1.a. Relevant Preliminary Findings

We have conducted a comprehensive evaluation of the predoctoral tobacco cessation dental curriculum offered in all US dental schools and have developed a core DTCS using innovative educational technologies to disseminate tobacco cessation guidelines into the dental curriculum and to establish clinical competency. This is good foundation for establishing the dental clinicians knowledge and familiarity with this important behavioral intervention. The pre-doctoral experience requires reinforcement during the post-doctoral program to sustain the new knowledge acquired and to establish clinical behaviors that incorporate tobacco cessation into the office routine. There is limited information available about post-doctoral tobacco cessation curriculum or how to tailor a program for post-doctoral general or specialist dentist education.

The DTCS program was evaluated for effectiveness in the dental student population at Columbia University (Albert et al., 2012). Surveys were administered pre- and post-completion of the online course to all participants. The surveys assessed attitudes regarding tobacco cessation in dentistry, knowledge of tobacco use and cessation, and self-efficacy regarding tobacco cessation counseling.

At baseline most students believed that the dentist or dental hygienist should be involved in tobacco cessation activities in the dental office. Further, students had positive attitudes about tobacco cessation in dentistry with regard to the importance of tobacco cessation as a component of preventive dentistry, and the role dentists should play educating patients about tobacco use, and encouraging and discussing tobacco cessation. However, students had negative attitudes about dentists' ability to be successful at tobacco cessation at baseline. This

significantly improved at follow-up. Our examination of pre- and post-module knowledge showed a significant increase in student knowledge. Prior to taking the online course students scored an average of 47% on the knowledge component, after the course the average increased to 82%, $t(52)=-13.105$, $p<0.001$. Student perception of their knowledge about helping people stop using tobacco also improved significantly after completing the course, $p<0.001$. Perception of knowledge improved from an average score of 2.26, indicating fair ability, to 3.49 indicating a good level of knowledge. Additionally, student confidence in their ability to help someone stop using tobacco increased significantly from an average score of 2.29 to 2.88, a change from slightly confident to moderately confident (Albert et al., 2012).

Students were pleased with the course site, consistently rating the website highly on a scale of one to five with five representing the highest positive rating score (Albert et al., 2012). This course is designed to adopt the USPHS 5 A's for dental students and is specifically tailored to the dental practice setting. Unlike many approaches that adapt programs for other health professionals to the dental setting, this program is innovative in providing the dentist with tailored instruction for tobacco cessation counseling and utilizing the 5 A's within the context of the dental visit. The arrangement of the course not only emphasizes that tobacco cessation fits within the routine of the dental visit, but also highlights the ease with which dentists can engage in tobacco cessation counseling behaviors.

B.2. Tobacco Cessation Education in Dental Post-Doctoral Training Programs and Residencies

In the U.S. organized dentistry has embraced tobacco cessation intervention as an integral part of dental practice, however dental schools do not provide adequate training to accomplish this goal. Tobacco cessation in dental schools is not standardized, nor has it achieved the level of a clinical competency (Albert et al., 2009, Albert and Williams, 2008, Gordon et al., 2009). In a 2008 survey of U.S. dental schools it was found that approximately 89% of dental schools provide tobacco related education as part of their school's curriculum for pre-doctoral students, however only 38% of schools have a course dedicated to assisting students master skills necessary for tobacco cessation/treatment. Additionally, 96% of schools used traditional full class lectures to teach tobacco cessation, while only 25% reported using information technology to teach the course (Albert et al., 2009). Tobacco education is incorporated into courses such as: oral pathology/oral medicine (67%) and periodontics (64%). Pathologists are the most common provider of tobacco cessation material (57%), followed by periodontists (36%), general dentists (34%), psychologists (21%) and dental hygienists (21%). The varied delivery approaches, diverse faculty, and multiple venues for providing this information across dental schools result in an inconsistent curricula and an inability to standardize tobacco cessation education for dental students. In addition, the number of curriculum hours allocated to tobacco cessation varies considerably across schools. The result has been that inadequate messages regarding tobacco cessation counseling are being provided to dental students during the crucial formative stage of their careers.

There are no mandatory requirements for tobacco cessation training in post-doctoral programs or residencies. The didactic coursework offered in those programs rarely includes a substance abuse or tobacco use by patients. Post-doctoral programs include general dental and specialty programs. Those programs primarily emphasize clinical dental skills. Lectures and

experience with behavioral interventions, such as tobacco cessation counseling are not an integral component of these programs.

To establish tobacco cessation in post-doctoral training programs an interactive core curriculum is needed. In addition, the core curriculum needs to be evaluated to assess its effectiveness and to determine if the instructional strategies are effective in positively impacting trainee's tobacco cessation behaviors.

Our research, and study results from colleagues (Albert et al., 2005, Gordon et al., 2006) confirm that barriers to implementation of tobacco cessation in dental offices exist and can lead to lack of effective tobacco cessation counseling. Barriers such as lack of time and low perceived clinician self-efficacy for tobacco cessation could be addressed by putting in place the opportunity for social modeling by instructors and increase time for skill development. Self-efficacy for tobacco cessation measures could be developed according to Bandura's Social Cognitive Theory through mastery experience, behavior modeling and improving emotional states such as fear (Bandura, 1997) Improvements in dissemination and teaching of the Five A's along with additional exposure via the clinical experience are needed within post-doctoral training programs to build tobacco counseling self-efficacy and insure that tobacco cessation becomes a core competency for practicing dentists.

B.3 Post-Doctoral Dental Education in the United States

Almost 50% of U.S. dental graduates complete post-doctoral training programs or residencies. These programs are based located in hospitals and dental schools. The programs include residencies and training programs in: 1) General Dentistry, 2) Prosthodontics, 3) Orthodontics, 4) Pediatrics, 5) Oral and Maxillofacial Surgery, 6) Pathology and 7) Endodontics. The tobacco cessation training program in this proposal will be customized for the first five of the groups listed above. Pathology and Endodontic trainees have minimal opportunities for behavioral interventions with their patients and will therefore not be included.

The reach of these programs is broad. In 2010 there were 2,908 first-year trainees and residents in these programs. Therefore the potential for creating effective change in tobacco education for dental professionals is great.

C. Technical Approach, Intervention Design and Methods

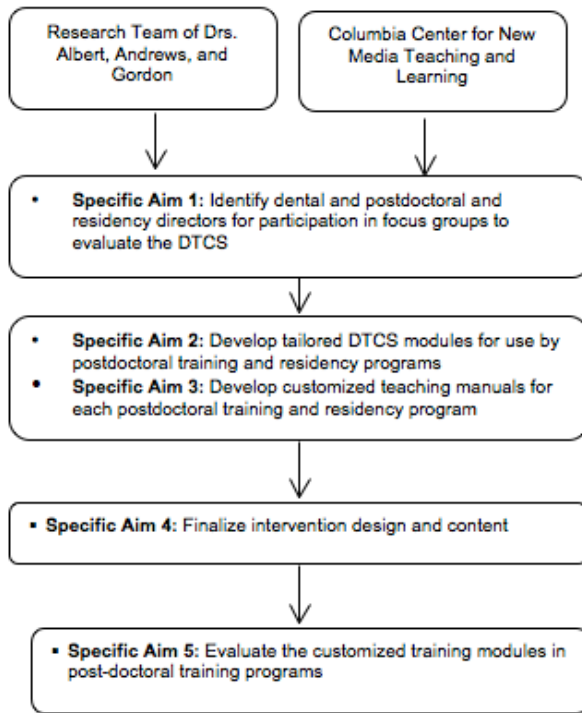
The program uses innovative educational technology developed by CCNMTL to create a virtual classroom via an online course. The student participates in exercises that reinforce all 5A's. The course culminates in a series of virtual patients where the trainee establishes clinical competency in assisting the patient with the quit attempt. Upon course completion the trainee is competent in the use of all pharmacotherapeutics for tobacco cessation. The focus groups will be used to guide the development of tailored teaching manuals for each post-doctoral program.

C.1. Overview of Proposed Project

The DTCS Training Tool is designed to train post-doctoral dental trainees and residents on how to implement the USPHS 5A's into the dental office patient visit, provide knowledge on the oral effects of tobacco use, conduct tobacco cessation counseling, and select the appropriate

pharmacotherapy for patients. This is facilitated by various technologies including an online course guide, interactive videos, and simulated patient interactions. In the proposed study, our Research Team and CCNMTL will refine the DTCS core components well as write the tailored teaching manuals for each post-doctoral dental program (see Figure 1).

Figure 1. Program Overview



This proposal reflects collaboration among researchers from Columbia University College of Dental Medicine (David Albert, DDS, MPH), the Oregon Research Institute (Judy Andrews, PhD), the University of Arizona (Judith S. Gordon, PhD), and the Columbia Center for New Media Teaching and Learning (Ryan Kelsey, EdD and Cindy Smalletz, MA). The investigators have over ten years of experience with multi-institutional collaborations on tobacco cessation research on NIH and major foundation sponsored projects, and extensive research experience in interactive and tailored health communication for health behavior change interventions. The investigators have worked extensively with CCNMTL in developing and beta testing the Columbia University version of the post-doctoral

DTCS. We are therefore ready to immediately implement the one-year project.

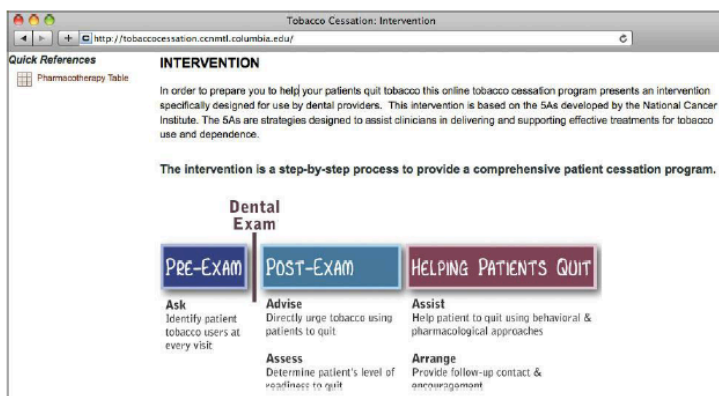
An interactive information technology based course specifically for dental students was developed by the co-investigators and the Columbia Center for New Media Teaching and Learning (CCNMTL) (Albert et al., 2012). This program will serve as the foundation for the core curriculum and course materials for the post-doctoral DTCS. The course consists of 3 sections: *Pre-exam*, *Post-exam*, and *Helping Your Patient Quit*. The sections are designed to align with typical dental practice and help students more easily assimilate tobacco cessation counseling into their clinic experience. The Columbia tobacco cessation program is a web-based, self-paced program that uses interactive modules in conjunction with a classroom component. The online modules are divided into three major sections that include videos and interactive knowledge and skills assessments that are uniquely arranged to provide instruction in tobacco cessation counseling in the context of a typical dental patient visit. The online component is presented as text and video, brief interactive knowledge and skills assessments, and virtual patient exercises. The online component is supported by a course guide and pharmacotherapy table that can be printed for easy reference during and after completing the module. The program culminates in the virtual patient exercises. These exercises present the tobacco use and relevant medical

health history of hypothetical patients. Based on the information provided, the trainee determines what medication(s) to prescribe.

C.2. Dental Tobacco Cessation System (DTCS)

Our concept for the program is to facilitate the adoption and integration of clinician counseling behaviors within the practice setting. The DTCS is intended to encourage the dentist to provide a brief tobacco cessation interaction that includes Asking about tobacco use, Advising to discontinue tobacco use, and the prescription of a pharmacotherapeutic agent to Assist the patient in quitting.

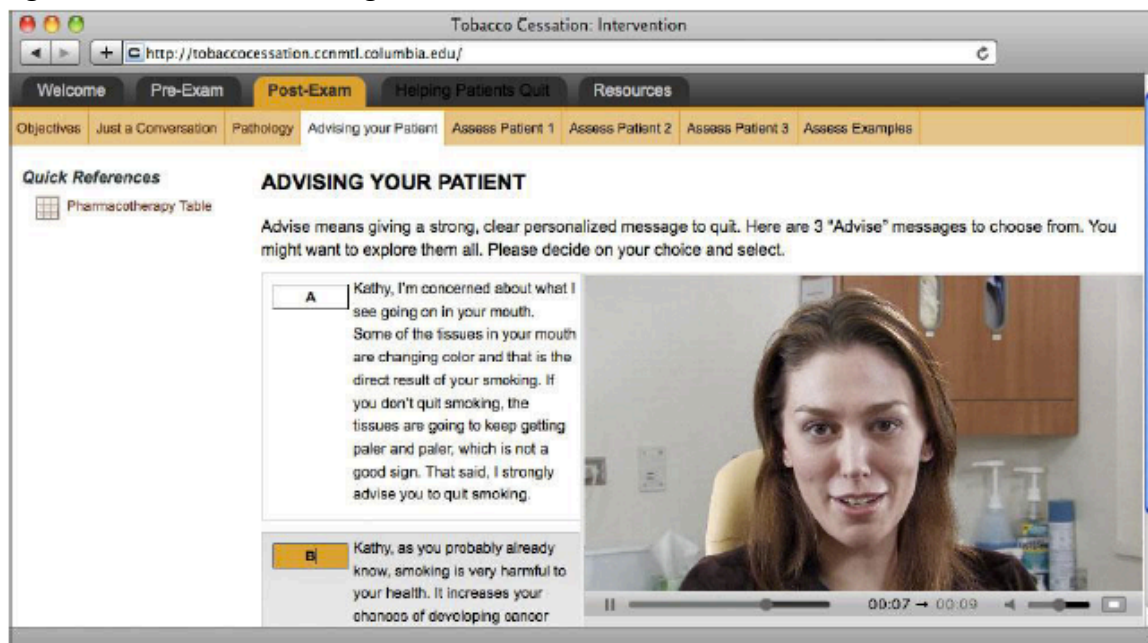
Figure 2: Welcome Page and Course Introduction



To more effectively disseminate the 5 A's in dental schools the Dental Tobacco Cessation System (DTCS) was developed (see Figure 2). The DTCS is unique in that it was developed specifically for the training of dental students. Modules for health professional students have been developed and tested (Corelli et al., 2005, Martin et al., 2010, Hudmon et al., 2003, Hudmon et al., 2006, Wiener, 2011). The DTCS uses interactive training modalities to

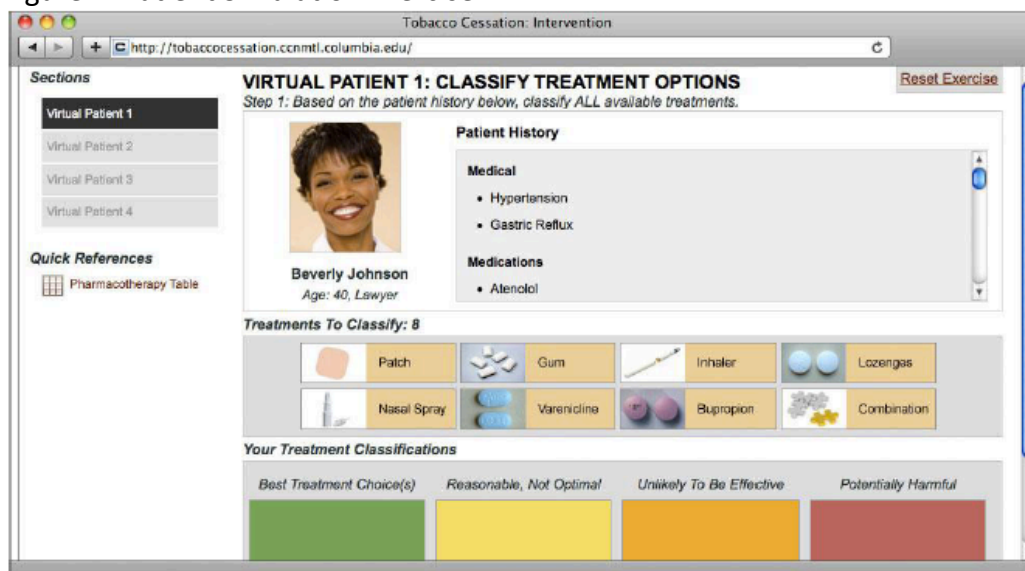
engage the dentist and to provide opportunities to practice tobacco cessation skills (see Figure 3).

Figure 3. Interactive Advising Video Exercise



It features exercises that culminate with patient simulation activities and clinical decision-making to increase tobacco cessation self-efficacy and provides a strong clinical foundation that could aid in the development of skills for Assisting patients with tobacco cessation pharmacotherapeutic regimens (Albert et al., 2011, Albert et al., 2012) (see Figure 4).

Figure 4. Patient Simulation Exercise



C.3. Post-Doctoral Trainees Training Session

The 5 A's and DEN-TC program will include a comprehensive three hour face-to-face training session provided by the Post-doctoral Residency Director and Drs. Albert and Gordon. The training program follows the Screening, Brief Intervention, and Referral to Treatment (SBIRT) model (Babor et al, 2007) for intervention and treatment of tobacco use. The 5 A's course will use the United States Public Health Service evidence based tobacco cessation guide for clinicians "Treating Tobacco Use and Dependence: 2008 Update" (Fiore et al, 2008). Practitioners will learn how to: routinely ask all patients about their tobacco use, relate oral health findings to tobacco use, give direct advice to quit all tobacco, assess patients' level of readiness to quit, help patients set a quit date, discuss and prescribe pharmacotherapy, provide written self-help materials, and provide information about the quit line for their patients.

The trainees will be introduced to the DTCS modules and will then be instructed to navigate the course during allotted study periods or during study times at home. Navigation of the program at home will require 3-5 hours of additional exposure to the program.

D. Evaluation Design

Five post-doctoral dental director focus groups will be assembled. Analysis of the focus group results will influence the modification of the DTCS modules for each post-doctoral trainee group and teaching/ training manual. The DTCS core module features a comprehensive USPHS 5A's model that has been tailored to the dental setting. When dental trainees log on to the site they are directed in a linear fashion through the program and exercises. That approach is

appropriate for general dentists and prosthodontists and we anticipate that it will remain as the standard for the post-doctoral general dentistry trainees and residents. We anticipate that modifications will be necessary for example for pediatric dental residents and orthodontic post-doctoral trainees. Those trainee programs are directed towards children and adolescents. The DTCS modules will be modified to emphasize the ASK and ADVISE steps, with Assistance provided that is age appropriate. Counseling for parents and caregivers will be added to the DTCS core modules. The oral and maxillofacial residents are dual degree clinicians (MD and DDS). We anticipate that the ADVISE component of the 5A's will receive more attention. The current DTCS emphasized relating oral findings to smoking to reinforce the ADVISE message. For the OMFS residents the pathology section will be expanded, and the oral-systemic connection emphasized.

Surveys will be utilized to assess pre and post knowledge, attitudes and behaviors of post-doctoral directors and trainees. Findings from the study will be presented at national dental meetings. In addition, findings will be submitted for publication in dental and health service research journals. Since this an online program with a concomitant teaching manual, program directors will be able to implement the program independent of the research staff. After evaluation and publication of findings the program will be made available to the American Dental Education Association and disseminated via posting at the MedEdPortal.

D.1. Focus Groups

Focus groups will be used to guide the customization of the DTCS and teaching/ training manuals. The focus groups will be conducted using a process recommended by Krueger and colleagues (Krueger, 1998; Krueger & Casey, 2000), and that we have successfully used in previous research studies. Five sets of dental director focus groups will be used to provide insight into the sources of complex behaviors and motivations that are required to successfully develop the tailored DTCS modules and training manuals. The dentist participants will be provided a \$50 stipend for their participation in a focus group.

The focus groups will be conducted at Columbia University and will include five groups of 10 specialty and general dentistry training program directors. A focus group moderator's guide will be used to explore dental directors' interest, needs, and insights for a tobacco cessation program. Focus group sessions will be approximately 1.0–1.5 hrs in length, and will be moderated by Focus Group Coordinator, Noreen Myers-Wright, with the module coordinator in the room as a silent observer and note-taker. The sessions will be recorded. The rationale for this approach is to eliminate investigator bias in conducting the focus group discussion. Preliminary data collection will consist of audiotapes and self-reported information. Qualitative data will be subjected to a thematic analysis using the existing DTCS core modules for organizing the topic-by-topic analysis of the discussion. The focus group moderator's guide will organize the group's discussion around the same set of topics in the same order, which is considered a positive attribute in its favor because it facilitates the comparison of analysis with subsequent focus group sessions.

We will use cases and prototyping to establish the exact requirements of the DTCS for each dental training program that are necessary for adoption of the USPHS 5A's in clinical practice.

D.2. DTCS Evaluation

We will evaluate the customized DTCS training modules in a dental school training setting and at two hospitals in New York. The post-doctoral training programs and dental residencies that will participate in the evaluation are located at the Columbia University College of Dental Medicine (CDM) in the upper Manhattan area of New York City and North Central Bronx Hospital (NCB) and Jacobi Hospital located in the Bronx area of New York City. The populations served by the two institutions are disadvantaged. At CDM 70% of the patients served participate in the Medicaid dental insurance program, and at NCB and Jacobi 90% of the patient population participates in the Medicaid dental insurance program. In the U.S. the typical patient with dental insurance coverage visits a dental office 2.55 times per year (Manski et al, 2002). There are 100,000 annual patient visits at CDM, and 120,000 at NCB and Jacobi. Each resident and post-doctoral trainee therefore encounters many tobacco-using patients.

Post-Doctoral Director Training and Evaluation. The Post-Doctoral Residency and Trainee directors at Jacobi, NCB and Columbia (12) will receive training in the DTCS that is tailored for each program. The tailored teaching/training manuals will be introduced during this session. The Directors will provide the tobacco cessation training with DTCS program staff in attendance to assist them with the implementation. The program is designed to be self-sustaining. It is anticipated that the Directors' will increase their self-efficacy around tobacco cessation and the use of the DTCS teaching modules and the teaching module. A baseline survey will be administered to the Directors' prior to the Director's training session. A follow up Director's survey and interview will be administered to ascertain the perceived usefulness of the DTCS for their trainee or residency program and to determine program sustainability.

Post-Doctoral Trainee Training and Evaluation. In the evaluation the DTCS will be introduced at the beginning of the first year of the post-doctoral training program or residency to insure that all residents and post-doctoral trainees receive the program at the same point in their education cycle (at program commencement). Residency programs vary in length as follows: General Dentistry-1 year, Prosthodontics- 2 years, Pediatrics- 2 years, Orthodontics- 2 years, Periodontics- 2 years, Oral and Maxillofacial Surgery- 5 years.

84 residents are enrolled in the first year of the Jacobi, NCB and Columbia post-doctoral training programs and residencies. A pre-survey to measure trainee tobacco cessation knowledge, attitudes and tobacco cessation practices. The Post-Doctoral Directors will administer this survey prior to provision of the tobacco cessation course and the DTCS research team. A follow up survey will be administered via Survey Monkey at 3-months post- training to measure the effect of the intervention on their knowledge, opinions, attitudes, and practices. These surveys will also include questions that will ascertain their satisfaction with, and utility of, the 5 A's and DTCS program.

DTCS Program Monitoring. CCNMTL will monitor director, resident and trainee use of the online program. To access the program a unique identifier is utilized to log in. This will enable the monitoring of program utilization. For each Trainee and Director user we will measure log in and log off times, number of times the program is accessed, the number of pages and sites visited, downloads of adjunctive materials and manuals, and completion of exercises and sections.

Data Analysis. We will analyze the findings in the aggregate and by individual program to determine the DTCS impact on Trainee and Director self-efficacy.

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Detailed Work Plan and Deliverables Schedule

During Quarters 01, the Focus Group Coordinator, Noreen Myers-Wright and Dr. Victor Badner, the post-doctoral consultant will recruit 10 post-doctoral program directors from the Tri-State New York metropolitan area to participate in one of five program specific focus groups to evaluate the core DTCS and discuss optimization of the program for each trainee group. The five focus groups will be program specific and include program directors from the following training programs and residencies: 1) General Dentistry, 2) Prosthodontics, 3) Orthodontics, 4) Pediatrics, and 5) Oral and Maxillofacial Surgery. Dental director focus groups will be convened in Quarter 02 for each of five post-doctoral program categories. Analysis of the focus group findings will direct refinement of the DTCS core curriculum elements and tailoring of program specific tailored teaching manuals. In Quarter 03 the tailored DTCS teaching manual will be developed with our partners at CCNMTL. The tailored program will be implemented to trainees in each of the participating programs. A post survey will be distributed three months after the tailored DTCS intervention. In Quarter 04 analysis of data will be conducted and program reports completed. The findings will be prepared for publication during Quarter 04. Any technical development as prescribed by the assessments will be completed along with the necessary research related responsibilities such as submission of Institutional Review Board human subjects' research protocol (see Figure 5).

Figure 5. Timeline

Project Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Quarter 01												
Submission to the Institutional Review Board human subjects' research protocol	■											
Recruitment of postdoctoral program directors	■											
Development and distribution of surveys for the postdoctoral dental directors	■											
Quarter 02												
Four post-doctoral dental director focus groups convened				■								
Analysis of the director surveys and focus group findings				■								
Refinement of program core curriculum elements and tailoring of DTCS program and teaching manuals				■								
Quarter 03												
Piloting of program to post-doctoral trainees							■					
Post-doctoral trainee DTCS post-survey distributed										■		
Quarter 04												
Data analysis										■		
Program reports completed										■		
Preparation of manuscripts for publication										■		
Report and dissemination of findings										■		