TESTING AN ORGANIZATIONAL CHANGE MODEL TO ADDRESS SMOKING IN MENTAL HEALTHCARE

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1 Study Summary

Title	Testing an Organizational Change Model to Address Smoking in Mental Healthcare
Short Title	Organizational Change Model to Address Smoking
IRB Number	823871
Methodology	This cluster randomized trial will be conducted in 14 Philadelphia community mental health clinics (CMHCs). Clinics will be randomized to either Addressing Tobacco Through Organizational Change (ATTOC) or Usual Care (UC) treatment groups and will be matched according to the following criteria: • Size • Organizational motivation
Study Duration	The estimated duration of participation for all subjects is 60 months. Individual study subject participation will last approximately 56 weeks.
Study Center(s)	The University of Pennsylvania will serve as the primary project location, and all recruitment and data collection efforts will be executed by University of Pennsylvania staff members. A subcontract has been established with the University of California – San Diego and University of New Mexico to oversee the implementation of the ATTOC intervention.
Objectives	**Primary:** • Aim 1: To evaluate the effects of the ATTOC intervention on provider adherence to the United States Public Health Service (USPHS) clinical practice guidelines for treating tobacco use disorder (TUD). • Aim 2: To assess the effects of the ATTOC intervention on rates of client smoking. • Aim 3: To evaluate the effects of the ATTOC intervention on client mental health functioning and quality of life (QOL). **Secondary:** • Aim: To assess the cost-effectiveness of the ATTOC intervention. **Exploratory:** • Aim 1: To assess changes in cultural and systemic barriers to treatment as mediators of the effects of the ATTOC model on provider adherence to guidelines for treating TUD and client smoking. • Aim 2: To inform model dissemination, we will identify components of the ATTOC intervention that predict greater change in provider adherence to guidelines for treating TUD and client smoking.
Number of Subjects	Recruitment will include14 CMHC sites with projected subject recruitment totals of ~280 clinic personnel and ~700 clients across all sites.

Main Inclusion and Exclusion Criteria	**Agency Inclusion Criteria:** • Use of an electronic health record (EHR) system • Must report client prescription data to Community Behavioral Health (CBH) • Must have at least 12 personnel who have clinical interactions with clients **Personnel Subject Inclusion Criteria:** • Must be 18 years of age or older • Must carry out clinical or supervisory duties • Must demonstrate the ability to communicate in English and provide written or verbal informed consent **Client Subject Inclusion Criteria:** • Must be 18 years of age or older • Must report daily average smoking of 5 cigarettes/day for the past 6 months • Must have a documented DSM Axis I or II disorder • Must demonstrate the ability to communicate in English and provide written or verbal informed consent **Client Subject Exclusion Criteria:** • Exclusive use of electronic cigarettes
Intervention	The trial will test a training intervention (ATTOC) designed to address organizational level change to promote improved treatment of nicotine dependence compared to usual care.
Statistical Methodology	• Sample characteristics will be assessed by treatment arm and site with chi-square or regression for their relationship to completion of outcomes (variables related to treatment arm or completion of follow-ups may be covariates in analyses.) • Fidelity and adherence measures will be evaluated across treatment arms, and the measures can be included in primary analyses. • Rate of missing data will be assessed as related to a range of variables using chi-square and regression and using appropriate methods for dealing with missing data.
Data and Safety Monitoring Plan	The study will be monitored by the PIs and co-investigators, and regulatory committees at the University of Pennsylvania (i.e., IRBs, OHR) as well as by a study specific Community Advisory Council and the Philadelphia Department of Public Health Institutional Review Board. During the course of the study, safety and data quality monitoring will be performed on an ongoing basis by the Principal Investigators and the study staff.

2 Introduction

The information that follows constitutes the research protocol for the Testing an Organizational Change Model to Address Smoking in Mental Healthcare study. This study will be conducted in compliance with the provisions set forth in this document. This study will also be conducted in full accordance with all applicable University of Pennsylvania Research Policies and Procedures, Good Clinical Practice Standards and all applicable Federal and state laws and regulations including *45 CFR 46*, 21 CFR Parts 50, 54, 56. All episodes of noncompliance will be documented.

Despite an overall reduction in US smoking rates from >50% in the 1960s to about 20% by 2000, the rate of smoking among persons with a serious mental illness (SMI) remains 2-3 times greater than in the general population [1]. Further, even the recent small decline in smoking rates that has been reported in the general population in the past decade has not occurred among smokers with an SMI [2]. In fact, 44% of all the cigarettes consumed in the US are by individuals with a psychiatric disorder [3] and the primary cause of death among Americans with an SMI is a tobacco-related disease [4, 5]. Unfortunately, smokers with an SMI are typically excluded from smoking cessation clinical trials, < 25% of smokers with an SMI receive evidence-based treatment for their tobacco use disorder (TUD; [6-8]), and mental health clinicians, compared to other specialists, are

significantly less likely to address TUD in their practice [9]. Transforming the mental healthcare system to integrate and adhere to evidence-based guidelines for the provision of TUD treatment is a priority of the National Institute of Mental Health (NIMH; [1]) and is a critical component of a national effort to meet Healthy People 2020 target goals for tobacco use (www.healthypeople.gov).

Indeed, current FDA-approved medications and guideline-based behavioral treatments for TUD can be as safe and efficacious for smokers with an SMI as they are for the general population [10], including varenicline for smokers with schizophrenia [11], major depression [12], or bipolar disorder [13]. Further, there are compelling reasons to expect that integrating smoking cessation treatment within community mental healthcare may be an especially effective strategy for addressing TUD among those with SMI. For instance, community mental healthcare providers have frequent and prolonged contact with their clients, who see them as a primary source for their healthcare [14-16]. Yet, cultural practices and beliefs (e.g., giving cigarettes to clients as behavioral reinforcers; a disconnection of mental health and wellness, the unsubstantiated belief that smoking cessation will cause psychiatric decompensation) and systemic issues (e.g., lack of training, ineffective use of an EHR, clinic personnel smoking behavior) are barriers to the treatment of TUD within the mental healthcare system [14, 17]. Thus, the adoption, implementation, and sustainability of evidence-based treatment for TUD within public mental healthcare clinics requires an organization-level intervention that adequately addresses the essential barriers that hinder effective care [8]. Our preliminary studies in community healthcare settings have shown that implementing organization-level interventions reduces barriers to integrating evidence-based TUD treatment and improves clinician adherence to treatment guidelines [18, 19]. Here, we propose, for the first time, use of a randomized clinical trial design, to examine our Addressing Tobacco Through Organizational Change (ATTOC) organization-level treatment model for improving adherence to US Public Health Service (USPHS; [20]) guidelines for treating TUD and reducing smoking rates among those with an SMI receiving care at community mental healthcare clinics.

2.1 Study Significance and Rationale

The Challenge: Between 1960 and 2000, the US adult smoking rate dropped from >50% to about 20% [21]. This stands as a monumental public health achievement and was driven by enhanced public education concerning the adverse health effects of smoking, the development of efficacious behavioral treatments and medications, and enhanced public health policies. Yet, this success has, at best, plateaued or, at worst, come to a complete stop; indeed, the US adult smoking rate has remained at about 20% for the past decade [21]. Without dramatic initiatives directed towards reducing the US rate of tobacco use, it is not likely that we will attain the Healthy People 2020 target for adult tobacco use of 12%.

Possible Solutions: There are likely several reasons for the stalled progress in smoking cessation rates over the past decade. Because only 1/3 of smokers who use evidence-based treatments for TUD (counseling and medication) are able to quit smoking [20], new treatments, or novel ways to use existing treatments, are needed, with work in this area ongoing [22, 23]. The impact of novel and existing treatments, however, depends on clinicians providing, and smokers using, such treatments. Regrettably, the rates of utilization of evidence-based treatments for TUD are as low as 6% [24]. And, despite the availability of evidence-based treatment guidelines [20] and the fact that nearly 70% of all smokers interact with, and respect the advice given to them by a healthcare provider, large national surveys show that 1/3-1/2 of clinicians do not provide smokers with evidence-based treatments for TUD [9]. A fundamental way to reduce US smoking rates is to increase healthcare provision and smoker uptake of evidence-based treatments for TUD.

Targeted Solutions: The under-utilization of evidence-based treatments for TUD is a particular public health problem among smokers with a serious mental illness (SMI). Smokers with an SMI are excluded from enrollment in most efficacy trials of treatments for TUD [25] and most clinicians working with persons with an SMI do not address TUD during their clinical encounters. In a national study of ~10,000 clinical encounters with a psychiatrist, 12% of clients who smoke were offered TUD treatment [26]. Other studies have found rates of TUD treatment among those with an SMI to be as low as 9% [27]. In fact psychiatrists are less likely to treat TUD than other physicians [28, 29]. More recent studies indicate that rates of TUD treatment for those with an SMI have increased but are no greater than ~25% [6, 7, 30, 31] and psychiatrists are still significantly less likely than primary care physicians to assist clients in quitting smoking [9]. A recent study showed that outpatient psychiatrists provide cessation counseling for 23% of clinic visits and provide nicotine replacement therapy (NRT) for <1% of clients [8]. Despite consensus from the USPHS [20], the American Psychiatric Association [32], and the NIH supporting the use of the same evidence-based cessation treatments used in the general population of smokers for those with an SMI, these smokers are inadequately treated for their TUD and remain one of the most under-served groups of smokers in the US.

The Consequences: The inadequate provision of evidence-based treatments for TUD among persons with an SMI contributes to a rate of smoking in this sub-group of Americans that is 2-3 times greater than the general US population [1, 17, 33]; the smoking rates among individuals with PTSD, generalized anxiety disorder, major depression, dysthymia, bipolar disorder, or a psychotic disorder are: 45%, 46%, 37%, 38%, 69%, and 49%, respectively [1]. Although individuals with a psychiatric disorder comprise 7% of the US population, they account for 44% of the entire US tobacco market [3]. This rate of tobacco use translates into greater morbidity and mortality for clients with an SMI vs. the general population [34-36]. Compared to age- matched controls, individuals with an SMI are twice as likely to be diagnosed with cancer or cardiovascular and respiratory diseases [37, 38]. Compared to clients with an SMI who do not smoke, smoking clients with an SMI show increased medical comorbidity, psychiatric symptoms, hospitalizations, substance abuse, and medication dosage increases [39-41]. The leading cause of death among Americans with an SMI is a tobacco- related disease [4, 5]. Finally, tobacco (not nicotine) induces the cytochrome P450

enzyme (CYP1A2) and speeds metabolism of many antipsychotics, anti-depressants, and anxiotlytics [39]. As such, smokers with an SMI require higher doses of medication than non-smokers with an SMI, increasing side effects and costs [16].

Barriers to Treating TUD among those with an SMI: The high rate of smoking among those with an SMI may be related to shared genetic factors between TUD and an SMI and the subjective benefits of nicotine (e.g., reduced negative affect, enhanced cognitive function) [16]. However, systemic and cultural factors endemic to many agencies that care for clients with an SMI undermine care and support tobacco use in this population [14, 17, 42]. For example, almost 1/4 of US psychiatric hospitals permit client smoking on premises [43] and smoking is often used as an incentive for pro-social behavior or treatment compliance [14].

Systemic Barriers: Table 1 lists structural and personnel barriers to TUD treatment in studies of mental healthcare facilities [14, 17, 44]. These agencies under-utilize centralized methods to identify, track, and treat smokers, lack the expertise needed to provide effective care, and support policies that undermine TUD client care. These barriers reduce the likelihood that personnel will provide TUD treatment [9, 20] and specific strategies for each barrier have been suggested [15, 45]. Cultural barriers involve adopting a harm reduction perspective regarding TUD among clients with an SMI, meaning that smoking is seen as less harmful than the assumed consequences of cessation: decompensation, depression, self-injurious behavior, use of alcohol or illicit drugs, and removal of an effective coping strategy [14, 42, 44]. These beliefs decrease the likelihood that healthcare personnel will provide TUD treatment [31] and are considered essential targets for promoting clinician adherence to treatment guidelines [42]. These beliefs are contrary to existing data (e.g., quitting smoking does not lead to decompensation [46-50] but is associated with improved psychiatric functioning [25]).

Table 1. Systemic and Cultural Barriers to Implementing TUD Treatment for Clients with SMI and Potential

	Barriers	Solution
Systemic	Lack of resources to treat TUD	Integrated treatment within Wellness Programs and linkage to no- cost pharmacotherapy via Medicaid
Systemic	Lack of knowledge for treating TUD	Provision of expert training program
Systemic	Allowing smoking around and within the agency	Assistance with establishment of smoke-free site
Systemic	Tobacco use by mental health agency personnel	Education about effects of clinic personnel smoking & help with personnel cessation
Systemic	Lack of systems to identify clients who smoke and track provision of treatment	Modify existing electronic medical record to assess, track, and treat tobacco use
Cultural	Provider beliefs: persons with SMI are not interested in treatment or cannot understand benefits of cessation	Education concerning quit motivation, quit rates, and recognition of the benefits of quitting
Cultural	Provider beliefs: smoking ensures mental stability & cessation will worsen SMI symptoms	Education concerning the evidence that smoking cessation does not worsen mental health functioning
Cultural	Provider beliefs: treating TUD is not their responsibility	Site leadership to make provision of TUD treatment a responsibility

Model of Organization Change to Promote TUD Treatment for those with an SMI: Adequately addressing the barriers to the provision of treatments for TUD among clients with an SMI will require innovations in clinical systems and culture [15, 45] that should be guided by organization change theory [51]. Organizational Development Theory (ODT) is a framework for guiding the implementation of system-wide interventions using behavioral science strategies to improve the effectiveness of an organization [52]. ODT interventions focus on 3 organizational characteristics to facilitate organizational change: 1) organizational climate (i.e., beliefs of the organization established by organization leaders), 2) organizational culture (i.e., assumptions, values, and behavioral norms); and 3) organizational capacity (i.e., the adequacy of resources to meet organizational goals; [52]). Within an ODT framework, implementing and evaluating an organizational level intervention involves the use of external experts to: 1) diagnose (identify areas in need of improvement and potential causal factors); 2) develop change plans (i.e., identify strategies to resolve concerns raised during diagnosis); 3) conduct interventions (i.e., implement change plans); and 4) oversee evaluations (i.e., assess rate of implementation and improvement in areas identified during diagnosis [53-55]).

The Addressing Tobacco Through Organizational Change (ATTOC) model is a systems-level intervention to address systemic and cultural barriers that undermine assessment and treatment of TUD [51]. In this innovative way, ATTOC assumes that effective organizational change requires more than clinic personnel training; it also requires the application of organizational theory to address attitudinal and system barriers and promote a culture in which tobacco use is not accepted or supported [16] and that TUD treatment is integrated into standard practice. Consistent with ODT, ATTOC is implemented in 3 phases (Table 2): preparing for, implementing, and sustaining change. By addressing cultural barriers and strengthening the care system (e.g., integrated treatment), ATTOC intends to have sustained benefits beyond the intervention.

ATTOC has been implemented as a quality improvement initiative in >100 mental health and addiction setting, including VA community-based outpatient clinics, Psychosocial Rehabilitation Clubhouse settings, and mental health centers in China. Recently, the Connecticut Dept. of Public Health used ATTOC in 9 outpatient mental healthcare agencies (see Preliminary Studies). While these projects show the feasibility and potential impact of implementing ATTOC in the type of setting proposed in this application, there has been little systematic evaluation of the model's impact on client tobacco use or other important clinical outcomes and no study to date has used a randomized trial design with a control group. The lone published evaluation of

ATTOC was conducted in the context of in-patient substance abuse treatment and used a non-randomized, single-arm, prospective design [18] [see also Preliminary Studies section for our pilot studies]. Three residential, substance abuse treatment sites received the ATTOC intervention. Clinician behavior and client tobacco use was assessed pre- and post-intervention, and at a 6- month follow-up. On an organizational level, clinician beliefs about treating TUD became significantly more positive and clinician provision of NRT significantly increased post-intervention (verified by clients). On an individual level, significant post-treatment improvements were reported in: client willingness to quit and use of TUD treatments. Tobacco use rates among clients, however, were not significantly lower post-intervention. Several reasons could explain this but, most notably, clients remained at the clinic for a mean of 6-7 weeks and, thus, were exposed to an enhanced model of care for a short time. Also, and perhaps most important, subjects in the pre-post evaluations were different inpatient cohorts. Further, bupropion, varenicline, and combination NRT were not offered as treatment options, each of which is superior to nicotine patch [20]. Lastly, policy changes, including on-campus tobacco use, were challenging to implement in a residential treatment setting (although we have shown this is feasible [56]). While these data support the feasibility and impact of ATTOC on key barriers to cessation, studies – using a randomized design, tracking individual client outcomes, targeting out-client settings that provide sustained care, and promoting more effective medications are needed to fully evaluate the ATTOC model for addressing TUD among those with an SMI.

Community Mental Healthcare is Optimal Setting: ATTOC may be well-suited to community mental healthcare settings. First, individuals with SMI view community mental healthcare providers as a primary source for healthcare and TUD treatment [57]. Very few individuals with an SMI receive consistent medical care or have a designated primary care physician [14]. Surveys of those with an SMI show that those who smoke would appreciate greater assistance from their mental health counselor to quit smoking [58]. Second, community mental healthcare providers have frequent and prolonged contact with their clients, often lasting years, allowing for repeated and extended TUD treatment, which may be more effective vs. short-term treatment [59], and allow for close monitoring of responses to pharmacotherapy and cessation, ensuring safety, adherence, and adjustments to psychiatric medications [14]. Third, community mental healthcare staff has extensive training in, and experience with, providing behavioral and pharmacological addiction treatment [15]. Agencies have successfully integrated addiction treatment within their standard of care (e.g., [60]) and an integrated model can be more effective for reducing tobacco use than referring clients to outside services [50]. Fourth, community mental healthcare agencies have incorporated Wellness and Recovery initiatives into standard care, within which TUD treatment can be integrated [14-16, 61, 62]. Many community mental healthcare facilities, including those in Philadelphia (http://www.dbhids.org/recovery-transformation-papers), have moved beyond managing symptoms to include issues such as diet, exercise, stress management, and annual medical and dental visits [63, 64]. Lastly, while community mental healthcare clinics are autonomous, they are often overseen by centralized administrative agencies. In 2012, Philadelphia established The Evidence-Based Practice and Innovation Center, a group of academics, city officials, and community mental health experts, to coordinate the implementation of effective innovations into care throughout the mental healthcare system (see letter of support). This aspect of community mental health services can be leveraged to facilitate dissemination of the training program should it be shown to be efficacious in the present trial.

Innovation: This study is innovative in several ways. First, this will be the first evaluation of ATTOC within outpatient community mental healthcare using a single client cohort and a randomized controlled trial design. If our main hypotheses are supported, the trial results may encourage evidence-based innovation in how TUD is treated within community mental healthcare organizations. Second, while we will evaluate changes in barriers and clinician behavior, as done previously, we will also assess, for the first time, changes in individual smoking behaviors, mental health functioning and QOL, as well as cost-effectiveness following ATTOC implementation. Third, we will use the EHR to implement smoking cessation treatment and to monitor key outcomes (e.g., prescription data). By implementing the trial within public mental healthcare clinics, the study uses existing infrastructure as a laboratory to assess a model to enhance clinician practice and reduce client smoking rates, which increases generalizability and could lead directly to clinical innovations on a national scale.

Table 2. ATTOC Model for Organizational Change to Treat TUD

Phase One (Steps 1-5): Prepare and Organize	
Step 1	Create a sense of urgency and assess engagement of top leaders of the organization and their goals
Step 2	Establish champions and leadership groups
Step 3	Assess organization's readiness to change and how organization addresses tobacco, including chart/policy review
Step 4	Develop written change plans and time-line
Step 5	Develop communication plan and materials needed for change
Phase Two (Steps 6-8): Change, Integrate, Adapt	
Step 6	Implement patient assessment, treatment plan, and treatment, including patient empowerment
Step 7	Implement staff training and recovery and monitor progress
Step 8	Implement environment changes to support clinical treatment changes, including limiting or abolishing tobacco use
Phase Three (Steps 9-10): Document, Monitor, Sustain	
Step 9	Update policies and standard operating procedures (SOPs)
Step 10	Support sustained organization and cultural change

Summary: If we are to meet the Healthy People 2020 target goal for smoking of 12%, a national strategy must include methods to increase clinician provision and smoker use of evidence-based treatments for TUD, especially among under-served groups. Systemic and cultural barriers within mental healthcare organizations undermine effective treatment for TUD among those with an SMI and require comprehensive organization-level interventions. Preliminary data suggest that the ATTOC model improves clinician provision and client use of treatments and implementing ATTOC in

outpatient community mental healthcare may capitalize on unique benefits of this context. Thus, we propose the first randomized controlled trial to evaluate the ATTOC model for reducing tobacco use rates among those with an SMI. The trial results may facilitate national dissemination of the ATTOC model within community mental healthcare agencies, providing an essential strategy to help achieve the Healthy People 2020 tobacco use goals.

2.2 Relevant Literature

Smoking Cessation Research: Drs. Schnoll and Leone have led TUD trials for ~2 decades [19, 59, 65-71]. Dr. Schnoll has tested methods to train oncologists to treat TUD [71] and Drs. Schnoll and Leone have examined predictors of clinician adherence to TUD treatment guidelines [19, 72-76]. Dr. Schnoll co-led efforts to devise TUD treatment guidelines ([77]; http://www.asco.org/sites/default/files/tobacco_cessation_guide.pdf) and Dr. Leone co-chairs the Philadelphia Tobacco Control Coalition, a partnership of the Philadelphia Department of Health (DoH), community leaders, and academics to improve the treatment of TUD. Dr. Ziedonis' career has focused on treating TUD among those with SMI and on implementation science. He has co-led treatment guideline development for the American Psychiatric Association (APA) and led the NIMH report on TUD among those with an SMI [1]. He has developed, implemented, and evaluated TUD treatments for those with an SMI [51, 58, 63, 78-80], including Learning About Healthy Living (LAHL; a guide for implementing TUD treatment for those with SMI) which is part of ATTOC [81]. Dr. Evins is an expert in the treatment of TUD among those with SMI, having led studies of TUD treatments in this context for >15 years [49,82-84], including a recent study of extended use of varenicline for those with SMI [85]. She has developed clinical treatment guidelines relevant to this population which will be included in the ATTOC training [86].

Pilot Study to Improve Treatment of TUD in Philadelphia DoH Clinics: Drs. Leone and Schnoll completed a single-arm study to assess the effects of a training program in TUD treatment on clinician behaviors. The study was implemented in DoH clinics that primarily serve low-income, minority populations (e.g., 26% of clients below poverty line; 57% African American or Hispanic). In 9 months, 217 clinicians were recruited and completed a baseline assessment of "simple" (asking about tobacco use, advising cessation) and "complex" (providing medication, quit-line referral) TUD treatment behavior. Training, based on the ATTOC model, involved a clinic visit to provide instruction in TUD treatment, educational material, and discussions to address beliefs that may undermine the provision of TUD treatment, access to a training website, 3 reminder letters, and a follow-up visit to reinforce training. At a 2-month post-treatment assessment, clinician treatment of TUD increased for "simple" (p=.04; 11% improvement) and "complex" (p<.001; 30% improvement) behaviors [19]. This study demonstrates our ability to collaborate with the DoH to implement organizational change interventions within health clinics that assist primarily under-served communities.

Preliminary Data from Philadelphia DoH Mental Healthcare Clinics: Drs. Leone and Schnoll initiated the pilot clinician training program described above with community mental health clinics (CMHCs; http://smokefreephilly.org/quit-now/for-mental-health-professionals/). So far, we have recruited 167 mental healthcare clinicians from 10/40 agencies approached (25%) and followed the methods described above. While data collection is ongoing, our preliminary findings in the context of mental healthcare are similar to what we found in primary care, with upwards of a 14% increase in "complex" TUD treatment behavior (e.g., connecting clients to TUD treatment; p = .02). These data demonstrate the potential effects of ATTOC in Philadelphia community mental healthcare and show the feasibility of recruiting clinics for the proposed study.

Preliminary Data from Connecticut DoH Mental Healthcare Clinics (http://communicare-ct.org/page/13752-Tobacco-Cessation): We now have data from the evaluation of ATTOC in 9 outpatient mental healthcare agencies. A baseline assessment showed virtually no screening, assessment, or treatment of TUD across agencies. Following implementation of ATTOC, agencies enrolled 1761 clients in TUD treatment; of the 50% of clients attempting to quit, 60% used FDA-approved TUD medication. Significant effects were found at follow-up for 30-day point prevalence cessation (13% quit rate) and reduction in daily smoking among those non-abstinent (mean reduction=3-4 cigarettes/day). Another 31% of the 1761 engaged in lower motivation treatment options (LAHL) and demonstrated significant reduction in smoking and 7% of these entered the quitters program and quit smoking. The level at which ATTOC was implemented was assessed, in a way consistent with how we propose for Exploratory Aim 2. A dose-response-like effect was found: the agencies that used more of the ATTOC model showed the largest degree of systems change (e.g., documentation of smoking, development of TUD treatment programs), vs. agencies that implemented fewer elements. On an individual level, agencies that used the most ATTOC elements enrolled 72% of their clients in TUD treatment, vs. agencies that used fewer ATTOC elements (35%), or none of the ATTOC model (11%).

Organization Change Research: Dr. Ziedonis developed ATTOC and has led several organization- level evaluations of its impact [18]. He has led or co-led initiatives to improve TUD treatment for those with an SMI for the RWJF, NIMH, NIDA, MA Department of Mental Health, Veteran's Affairs Health Care, the APA, the Smoking Cessation Leadership Center, and SAMHSA, and served on the IOM's committee on TUD in the VA/DOD. Dr. Kimberly is an expert in healthcare management and organizational change and has consulted for private companies, healthcare organizations, and government agencies, including the IOM. He is the author of books on organizational innovation in the healthcare industry [87], on training public health leaders [88], and on organizational interventions to improve the quality of mental healthcare and addiction treatment [89, 90].

Community-based Mental Healthcare: Mental healthcare for all Medicaid-enrolled Philadelphians is managed through Community Behavioral Health (CBH), a quasi-governmental agency within the city DoH. CBH, in turn, contracts with the Philadelphia Coalition, the Philadelphia Alliance, and the Mental Health Association of Southeastern Pennsylvania (MHASP), which oversee >70 of the individual agencies that provide community mental healthcare for the City's 470,000 Medicaid recipients. While CBH authorizes payments, regulates and manages provider agencies, and serves as a central data repository, the Alliance, Coalition, and MHASP represent >70 individual CMHCs and oversees educational initiatives and policies across

the CMHCs (see letters of support). Further, the PENN Center for Mental Health Policy and Services Research (CMHPSR) conducts research to enhance the delivery of mental healthcare and has partnered with CBH, the Coalition, and the Alliance. Dr. Mandell, the CMHPSR Director, has a 15-year history of partnering with CBH to improve outcomes for those served in the public mental healthcare system. Currently, Dr. Mandell is collaborating with CBH to identify innovative methods to enhance youth mental healthcare [91]. CMHPSR support initiatives that bring together academics, government, and mental health agencies to implement and evaluate system changes.

Cost-effectiveness Research: Dr. Polsky is the Executive Director of the Leonard Davis Institute of Health Economics at PENN. His research involves the economic evaluation of medical and behavioral health interventions, including CEA of treatments for opioid dependence and alcohol treatment. He is coauthor of the definitive book on the subject, “Economic Evaluation in Clinical Trials”.

Community Advisory Council (CAC): This study will be supported by a council with expertise in community mental healthcare and research, comprised of: Dr. Mandell, Dr. Neimark, Ms. O’Rourke, Ms. Brummans, and Mr. Brody. Council members have >3 decades of research, clinical, administrative, and educational experience within community mental healthcare and will assist with recruitment, implementation, measurement and intervention refinement, accrual/retention monitoring, and the dissemination of findings.

3 Study Objectives

Achieving the Healthy People 2020 target goal for tobacco use requires efforts to lower the rate of tobacco use among those with an SMI. This necessitates identifying novel and impactful methods for increasing the provision of evidence-based TUD treatment in the context of community mental healthcare, including FDA-approved medications and guideline-based behavioral interventions. Unfortunately, systemic and cultural barriers within public mental healthcare organizations hinder the assessment and treatment of TUD within these organizations, contributing to an excessive rate of tobacco use and high rates of morbidity and mortality in this sub-group of Americans. This trial will evaluate our organization-level tobacco control program for reducing these practice barriers, promoting evidence-based care, and reducing smoking rates for those with an SMI, and doing so without worsening mental health and in a cost-effective manner. If this approach is shown to be effective, cost-effective, and safe, it can serve as a model for the nation’s community mental healthcare infrastructure, representing a powerful initiative to address tobacco use in a highly under-served sub-group of smokers, and support efforts to attain the Healthy People 2020 goals regarding tobacco use.

3.1 Primary Objectives

- Aim 1: To evaluate the effects of the ATTOC intervention on provider adherence to the USPHS clinical practice guidelines for treating TUD. Hypothesis: At the end of the intervention and at a 3-month follow-up, rates of adherence to guidelines for treating TUD will be greater among clinic personnel that receive the ATTOC intervention vs. clinic personnel in usual care.
- Aim 2: To assess the effects of the ATTOC intervention on rates of client smoking. Hypothesis: At the end of the intervention and at a 3-month follow-up, rates of client smoking cessation will be significantly greater in clinics that receive the ATTOC intervention than among clients treated with usual care.
- Aim 3: To evaluate the effects of the ATTOC intervention on client mental health functioning and quality of life (QOL). Hypothesis: Using non-inferiority testing, at the end of the intervention and at a 3-month follow-up, there will be no significant degradation in mental health functioning or QOL among clients who receive care at clinics that received the ATTOC intervention than among clients treated with usual care.

3.2 Secondary and Exploratory Objectives

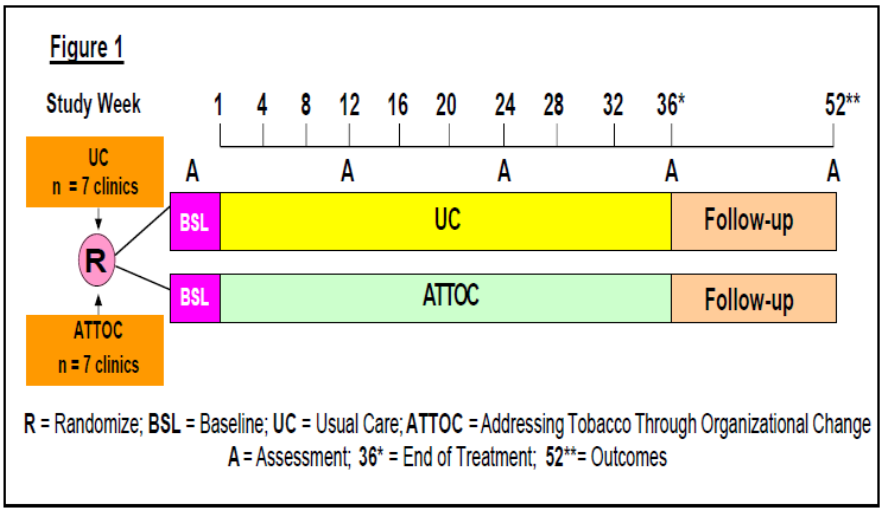
- Secondary Aim: To assess the cost-effectiveness of the ATTOC intervention. Hypothesis: ATTOC will have a favorable incremental cost-effectiveness ratio measured as dollars/quitter and dollars/life-year saved.
- Exploratory Aim 1: We will assess changes in cultural and systemic barriers to treatment as mediators of the effects of the ATTOC model on provider adherence to guidelines for treating TUD and client smoking.
- Exploratory Aim 2: To inform model dissemination, we will identify components of the ATTOC intervention that predict greater change in provider adherence to guidelines for treating TUD and client smoking.

4 Investigational Plan

4.1 General Design

This cluster-randomized trial will be conducted with 14 Philadelphia CMHCs, 7 randomized to ATTOC and 7 to usual care (UC). Following randomization, study staff will visit sites to recruit clinic personnel and clients over a 4 to 6 week period. Those eligible will complete informed consent and HIPAA forms and a baseline assessment to establish pre-intervention levels on all measures (baseline). After 4-6 weeks, the ATTOC intervention will be implemented over 9 months, from Week 1 to Week 36 (with UC at the control sites). Two mid-intervention assessments (Weeks 12 and 24) will allow for performance feedback (see Outcomes Data) and mediational analyses. Week 36 (end-of-treatment; EOT) and 52 (3-months post-EOT) assessments will allow for evaluation of changes on outcomes between groups over time. All measures will be conducted at the respective CMHC

(or over the phone if necessary) and 7-day point prevalence smoking cessation will be verified using a breath carbon monoxide (CO) monitor (abstinence = < 8ppm; [93]). Figure 1 illustrates the study design.



4.2 Randomization to Interventional Group

Although randomization and inclusion criteria will increase comparability between arms, sites will be matched by: 1) size (i.e., moderate [15-30 personnel; 110-249 clients] vs. large [>30 personnel; >249 clients]) 2) organizational motivation (e.g., < 30 vs. ≥ 30 on sum of all 12 items from the Organizational Readiness for Implementing Change [ORIC] measure [92]). We will try to enroll >2 sites (1/arm) that do not respond to initial invitations to enroll to include CMHCs with low readiness to implement change. Using the ORIC and outreach to sites with low motivation, we hope to reduce the potential of over-volunteering that can limit generalizability. If a CMHC has multiple locations, all locations will be randomized to the same arm but they will be considered 1 of the 14 randomized sites. Once eligible and interested sites are identified, using the small-sample equivalent to matching on stratification data, they are randomly assigned to UC or ATTOC. Computerized randomization within our Data Management System (DMS) will be provided by Dr. Wileyto. Once randomized, participants (personnel and clients) will be recruited for the trial.

4.3 Rationale for Study Design

An alternative design would involve randomization of clients and providers within the agencies. Although that could avert potential confounds attributable to differences between agencies, we considered the risk of contamination – and, thus, a threat to internal validity – from such a design to be too probable. While an agency-level randomization may be subject to confounding as well, we will match the agencies on key variables before randomization to increase control over potential treatment confounds and we will use appropriate analytic models to account for this potential confounding (see Data Analysis). We also considered either: 1) not including a control arm; or 2) providing a more potent control arm, but considered the present design one that would allow for more convincing conclusions about the effects of ATTOC vs. current practice. Thus, we viewed the proposed design to be the ideal balance between internal and external validity.

4.4 COVID-19 Adjustments

Due to the COVID-19 pandemic, all sessions are being done remotely at this time. If a client reports abstinence, they will be asked to come to the office to do a CO reading. They will be compensated an additional $10 if they travel to the office. This applies to Week 12, 24, 36, and 52 sessions.

4.5 COMHAR Clinic

Due to the COVID-19 pandemic, the recruitment and enrollment process had to be adjusted since the clinic is largely running via telemedicine. Clinic leadership will send a letter informing their clients of the study and what it entails. A research assistant's number will be listed if they wish not to be contacted. After two weeks, the research team will begin to reach out to clinic clients to conduct an eligibility screen. If the client is eligible and wants to participate, a time will be scheduled for the baseline session. A CO reading will not be conducted at baseline. The consent will be read aloud in its entirety to patient participants. The baseline session will be conducted remotely (over the phone or video chat) and participants will then give their verbal consent. The research staff member will note in the consent form that the participant affirmed their consent, as well as the date of the consent. The consent document will also be sent to participant, either over email or through the mail. For clinic personnel participants, reviewing the consent form will be completed using a RedCap survey. Once the consent is signed, a research staff member will electronically sign it. Staff will email the survey link to them and the subjects will indicate within the RedCap survey if they wish to participate and will then be prompted to enter their First and Last name and sign the form using their finger or mouse. Subjects will be able to download their signed version of the form from RedCap, and staff will also download a version to

be saved to the electronic regulatory binder on our secure server, or, printed and placed in our physical binder. In order to make things more convenient and efficient, the study questionnaires for clinic personnel enrolled in the study will be on REDCap. A CO reading for clients will not be collected at baseline. Participants who report abstinence at week 12, 24, 36, or 52 will be asked to come to our office for a CO reading. The CO reading will be done outside and the staff will try to maintain social distance as much as possible. The participant will be given an additional $10 for travel compensation. The training session for the personnel will be conducted over video chat (could be split up into two sessions on different days) before the recruitment period is over. These same procedures will be used at the Merakey clinic.

4.6 Study Timeline

Providing ATTOC or UC will occur sequentially from Months 7-36 (end of Year 3): 3 sites in months 7-16, 4 sites in months 17-26, 4 sites in months 27-36, and 3 sites in months 37-48. Data collection, analysis, and reporting will occur in Years 4-5 (see Table 3).

Table 3. Study Timeline

Tasks/Months	**1 12 24 36 48 60**
Refine/test DMS, Train Staff (1-6)	X-X
Recruitment/baselines (7-36)	X ----------X
Treatment (7-36)	X ----------X
Outcome assessments (12-48)	X ----------X
Analysis/manuscripts (48-60)	X ----X

4.7 Study Measures

Screening

- ***Community Mental Health Clinic Eligibility Screen:*** The assessment will be completed by a CMHC leader such as a CEO and contains questions that will assess eligibility criteria as well as organizational readiness (the latter will be accomplished with the ORIC). The results of this assessment will be taken into account during clinic intervention randomization.
    - ***Organizational Readiness for Implementing Change (ORIC)***: This psychometric assessment measures change commitment and change efficacy [92] in prospective CMHCs. This assessment includes a scale with 12 questions.
- ***Clinic Leadership Informed Consent Acknowledgement:*** A designated clinic leader will review the informed consent and will complete the inform consent acknowledgement form. This form was devised to help ameliorate possible concerns regarding undue coercion surrounding clinic personnel recruitment. This form is included for review by the personnel participants during the informed consent process.
- ***Client and Personnel Eligibility Screen:*** These brief assessments contain questions based on inclusion and exclusion criteria to ensure study eligibility.

Covariates

- ***Client Psychiatric History:*** Among clients, we will collect self-reported data on past and current psychiatric conditions/diagnoses, duration of illness, and lifetime frequency of psychiatric hospitalizations. Psychiatric diagnosis will be confirmed via data requested from CBH.
- ***COVID-19 Quitting Experience Questionnaire:*** The purpose of this survey is intended to capture the participant's experience quitting smoking during the COVID-19 pandemic. The survey will be administered at baseline for personnel. The survey will include 24 questions recommended by the NIH for research pertaining to COVID-19, 11 questions related to smoking behavior and the pandemic formulated by staff, and the PHQ-2 and GAD-2 measures for depression and anxiety symptoms (4 questions total).

Mediators:

- ***Smoking Knowledge, Attitudes, and Practices (S-KAP):*** This survey is composed of 5 scales that assess systemic and cultural barriers to smoking cessation. These scales measure clinician practices, knowledge regarding smoking risks, barriers, attitudes and efficacy [103]. Systemic barriers include provider: 1) access to resources to treat TUD; 2) level of knowledge to treat TUD; 3) implementation of smoking cessation policies such as a smoke-free campus; and 4) use of the EHR to document and track client smoking and treatment. Cultural barriers include provider beliefs about: client interest in smoking cessation, client ability to quit smoking, client ability to understand the benefits of smoking cessation, client mental health consequences from cessation, and smoking cessation treatment being their responsibility. These Likert-type measures are sensitive to change following implementation of ATTOC [18] and have good psychometric qualities [94, 103]. This survey will also be used to measure outcomes data (items measuring the rate of: asking clients about smoking, advising them to quit, providing assistance with quitting, and arranging visits to track progress; a total adherence score can be calculated [18].)
- ***Smoking Knowledge, Attitudes, and Services (S-KAS):*** This survey is essentially a client version of the S-KAP and will be used to measure systemic and cultural barriers to smoking cessation from the client's perspective. The survey

contains 4 Likert-type scales that measure client knowledge regarding smoking risks, attitudes about quitting smoking as related to the clinic setting, and assessments of clinician and program services, respectively [105].

Treatment Data:

- ***ATTOC Intervention Adherence Tool ("The Dashboard"):*** This web-based tool is used by the study team to track and monitor compliance and progress on the 10 ATTOC steps – on an organizational and on an individual (clinician) level. This adherence measure is used to determine the level of compliance with ATTOC steps so that variability across sites in the implementation of ATTOC can be included in analyses and to guide performance feedback. The dashboard is a visual figure with a numeric indicator using red (no movement), yellow (some progress), and green (completed) colors that enables staff to see progress on key metrics of change. Data are gathered through staff self-report and chart reviews, study measures, and the environmental scan. On an organizational level, examples of metrics include: the selection of a site champion, the use of change and communication plans, the implementation of change plans, additional staff training, the provision of TUD treatment (counseling, referrals, pharmacotherapy), the establishment of a smoke-free campus or progress in establishing smoking restrictions, use of no-smoking signage, inclusion of TUD treatment within SOPs, and provision of TUD treatment brochures. On an individual level, examples of metrics include: the provision of TUD counseling, number of referrals to smoking cessation treatment programs including the Quit-line, and the provision of pharmacotherapy. This dashboard assessment reflects metrics of overall organizational and individual clinician change and is used as a covariate in analyses of study aims and to guide performance feedback to clinic leadership, site champions, and clinicians. We will also include a measure of fidelity to determine whether the ATTOC model was implemented as intended. This measure includes: attendance at on-site training sessions, logging onto the ATTOC program training website, and participation in training teleconference/video calls. The fidelity measure, analogous to a measure of treatment dose, will be expressed as a proportion of the number of training hours received and used as a potential covariate. All personnel participants are expected to interact with the Dashboard and update the metrics. The chosen site champion will be responsible for reviewing the metrics prior to scheduled training sessions and will summarize the findings for the group.
- ***ATTOC Change Plan:*** This instrument assesses the following: 1) agency goals 2) identifying key clinic leadership and champions 3) environmental scan 4) recording the change plan drafting process 5) recording the communication plan drafting process 6) setting client goals 7) setting staff goals 8) setting environmental goals 9) documenting clinic policy changes 10) identifying supportive activities to sustain organizational change. Once the leadership group and tobacco champion are identified, these individuals are tasked with meeting regularly (as the group deems fit) to hone the Change Plan over time. The tobacco champion serves in a secretary capacity to record meeting minutes and/or progress notes that will be presented to the ATTOC consultation team for review.
    - ***ATTOC Environmental Scan:*** An Environmental Scan provides a structured tool to assess: the strengths, weaknesses, opportunities, and threats to the new business plan or idea. The ATTOC approach applies this tool in order to assess an agency's preparedness to address tobacco, including past successes and efforts already underway on this issue. The Environmental Scan can be used to assess changes in organizational preparedness and inform potential improvements during the course of planning, implementation, and sustaining changes. This can assist the agency as they work on their change plan. The Environmental Scan focuses on four key areas of the ATTOC intervention:
        - Agency's campus and inside the buildings / Environmental Tobacco Control Efforts
        - Client Assessment and Treatment
        - Staff Competencies, Smoking, and Attitudes
        - Tobacco-Related Policies for Clients, Staff, and the Agency.

      This Environmental Scan enables the ATTOC consultation team to objectively document current tobacco-related activities and to subjectively assess preparedness for further improvements. In order to complete this form and the evaluation, the assessment process includes conducting a "walk through" of both the inside and outside of your agency, speaking with staff and clients, and also reviewing existing clinical charts and policies.

      Each of the four key areas receives a preparedness rating ranging from a"1" (not prepared) to "5" (highly prepared). For each area, there is a preparedness rating "key" providing a short description of general characteristics that constitute each rating. This key can serve as a guide for the consultant team when assigning preparedness scores.

      At the conclusion of the Environmental Scan, an overall client, staff, environment, and agency ratings are given. The ATTOC Consultant team rejoins the Leadership Team to discuss the agency's observed preparedness to address tobacco and to begin to formulate the agency's change plan to identify specific objectives for tobacco assessment, treatment, and policies.

    - ***ATTOC Communication Plan:*** Step 5 of the ATTOC Approach addresses the importance of supporting the Change Plan by developing a Communication Plan to facilitate internal and external communication needs. It is a way to communicate with stakeholders, determine channels for feedback, and to communicate new policies and procedures. This tool is used to familiarize the personnel participants with current clinic communication processes and resources and provides a framework for designing a new plan of action in this area.

Outcomes Data:

- ***Client Prescription Data:*** Client participant prescription data (for cessation medications or NRTs) will be requested from CBH.
- ***Time Line Follow-Back (TLFB):*** This assessment utilizes a structured interview method to assess smoking rates. Using a calendar with sufficient days from the prior assessment time point, study staff work with the participant to formulate a clear picture of whether abstinence was achieved each day. The purpose of the interview will be to reconstruct the participant's smoking practices, on a daily basis if possible. Beginning with current smoking habits, the staff member prompts the participant to recall previous smoking rates in a backward chronological fashion.
- ***CO Form:*** This assessment collects the CO reading (in parts per million) as well as smoking rate in the 24 hours preceding data collection and the time since the participant's last cigarette.
- ***Revised Behavior and Symptom Identification Scale (BASIS-R):*** Clients will complete the Revised Behavior and Symptom Identification Scale (BASIS-R), a 24-item assessment of mental health functioning [108] that yields a total score and subscale scores for: depression, interpersonal relationships, self-harm, emotional liability, psychosis, and substance abuse.
- ***Client Hospitalization Assessment:*** We will assess the frequency and duration of any illness-related in- client hospitalization. This self-report measure will be confirmed via data requested from CBH.
- ***Short-Form Health Survey (SF-12)***: This survey will assess physical and mental QOL of client participants [109, 110].
- ***Treatment and Client Costs:*** These costs will be estimated by multiplying the counts of resources used by the unit costs of those resources (the resource costing method [111, 112]), which summarizes the health care services used from the perspective of society (e.g., TUD treatment delivery time), not only protocol costs. ATTOC direct costs will be considered as will non-study medical services costs, recorded on a validated scale [113].

See Table 4 under Study Procedures for study events and associated measures.

4.8 Study Endpoints

4.8.1 Primary Study Endpoints

For Aim 1, we will assess adherence to guidelines for treating TUD as done previously [18, 31, 72, 73]. This measure, developed by Delucchi et al. [103], assesses components of the USPHS guideline [20]. Items measure the rate of: asking clients about smoking, advising them to quit, providing assistance with quitting, and arranging visits to track progress. A total adherence score can be calculated [18]. We will supplement this measure with questions about the content, nature, and intensity (in terms of time) of behavioral counseling provided. Clinician adherence will be assessed from the client perspective as well, using the client version of this scale [105], EHR adherence data will be accessed (e.g., documenting smoking status, use of pharmacotherapy), and prescription data (provided and filled) will be accessed by CBH.

For Aim 2, smoking status is assessed using self-reported 7-day point prevalence and CO to verify self-report [66, 106], with abstinence=self-reported abstinence for >7 days prior to the weeks 36 and 52 assessment and a breath CO <8ppm at the time-point [98, 99]. Participants are assumed to be smoking if they self-report to be smoking at the time-point, do not provide self-report or CO data at the time-point, or provide a breath sample at the time-point that is >8ppm [93]. Secondary outcomes will also be assessed (e.g., smoking status at week 12, smoking rate [number of cigarettes/day]).

For Aim 3, client mental health will be measured using several indicators [107]. We will assess the frequency and duration of any illness-related in- client hospitalization (available through the EHR). Clients will complete the Revised Behavior and Symptom Identification Scale (BASIS-R), a 24-item assessment of mental health functioning [108] that yields a total score and subscale scores for: depression, interpersonal relationships, self-harm, emotional liability, psychosis, and substance abuse. The Short-Form Health Survey (SF-12) will assess physical and mental QOL [109, 110].

4.8.2 Secondary Study Endpoints

Costs will be estimated by multiplying the counts of resources used by the unit costs of those resources (the resource costing method [111, 112]), which summarizes the health care services used from the perspective of society (e.g., TUD treatment delivery time), not only protocol costs. ATTOC direct costs will be considered as will non-study medical services costs, recorded on a validated scale [113].

5 Study Population and Duration of Participation

Within each recruited CMHC, there will be two groups of study participants per study arm: clinic personnel and clinic clients. Inclusion and exclusion criteria will be limited to demonstrate the benefits of a system-wide model of care that addresses both skills and culture in the real-world. A total population sampling strategy [31] will be used so that all supervisory and clinical staff (part-time, full-time, paid or volunteer) will be eligible, including medical staff, case managers, and clinical supervisors. Past studies report a >90% rate of participation using such methods [44, 94].

We have a long track record of ensuring appropriate representation of women and minorities in our smoking cessation clinical trials. For instance, three of our past smoking cessation clinical trials had samples that were comprised of 43-56% women [58,

65, 66]. Likewise, we have completed several smoking cessation clinical trials with samples that were comprised of 31-60% African Americans [69, 68]. Given our track record and the gender and race/ethnicity breakdown of the CBH agencies, we expect the following sample composition: 1) For personnel, we expect that at least 60% of the sample will be women and 25% will be representatives of racial/ethnic minority groups; and 2) For clients, we expect that at least 40% of the sample will be women and 60% will be representatives of racial/minority groups.

5.1 Duration of Study Participation

The duration of study participation including screening/baseline assessments to follow-up will be approximately 56 weeks.

5.2 Total Number of Subjects and Sites

A total of 14 CHMC sites will be recruited for the trial. At each site, 12-30 staff and about 50 clients will be recruited (Total N: Staff = ~280; Clients = ~700). Procedures will be standardized across sites.

5.3 Inclusion Criteria

Participating CMHCs must meet the following criteria for enrollment:

1. Must use an electronic health record (EHR)
2. Must report client prescription data to Community Behavioral Health (CBH)
3. Must have at least 12 personnel who have clinical interactions with clients

Clinic personnel participants must meet the following criteria for enrollment:

1. Must be 18 years of age or older
2. Must perform clinical care or supervisory duties
3. Must demonstrate the ability to communicate in English and provide written or verbal informed consent

Clinic client participants must meet the following criteria for enrollment:

1. Must be 18 years of age or older
2. Must report daily average smoking of 5 cigarettes/day for the past 6 months
3. Must have a documented DSM Axis I or II disorder
4. Must demonstrate the ability to communicate in English and provide written or verbal informed consent

5.4 Exclusion Criteria

The following would exclude a prospective **clinic client participant** from enrollment:

1. Exclusive use of electronic cigarettes (dual use with standard cigarettes will not be exclusionary)

There will be no exclusion based on gender or race/ethnicity, consistent with our demonstrated ability to recruit representative samples in terms of demographic characteristics [23, 66].

5.5 Subject Recruitment

The study will be implemented within Philadelphia's CBH provider network, which encompasses the >300 CMHCs that provide care to the city's >470,000 Medicaid recipients. The CBH Chief Medical Officer, and the Executive Directors of the Philadelphia Coalition, the Philadelphia Alliance, and MHASP, which represent >70 CMHCs and oversee educational initiatives within the agencies, will assist with recruiting agencies. A notice describing the opportunity to enroll in the study will be sent from Dr. Neimark, Ms. O'Rourke, Ms. Brummans, and Mr. Brody to CMHC directors, with instructions on how to ascertain information or to enroll (monthly meetings are also held by the Alliance, Coalition, and MHASP with CMHC CEOs and the research team has and will attend these meetings to publicize the study).

Clinic recruitment will include a brief survey including the ORIC measure to collect stratification data to reduce the risk for selection bias and increase the probability of generalizability. Dr. Neimark, Ms. O'Rourke, Ms. Brummans, and Mr. Brody will attempt to enroll >2 sites (1/arm) that do not respond to invitations. To assess sample generalizability, we will compare enrolled site characteristics (e.g., size, composition) to data available for all CMHCs at CBH. Each agency maintains a staff of 12-40 and a client load of >200-300, indicating that recruiting 14 sites will meet recruitment goals. While we opted for this prospective recruitment method to facilitate accurate stratification (vs. identifying all sites up-front), our pilot work recruited >167 mental healthcare clinicians for a training in treating TUD in one year and an ongoing trial with PENN and CBH to promote evidence-based treatment for youth mental illness used this approach to recruit 23 clinics [91].

Once sites are randomized, we will use a 4 to 6 week window for subject recruitment. This will allow study staff to recruit in-person for multiple days and across several weeks to ensure that we access all site personnel and a representative sample of clients. We have experience recruiting in clinic settings [59, 71] and have 2 ongoing studies that follow such procedures (R01 CA165001; R01 DA033681). If the 4-6 week period is not sufficient time to recruit a participant sample, the Principal Investigator reserves the right to lengthen the recruitment window by 4-6 weeks. The Principal Investigator may also need to under-enroll clinic personnel or client participant groups at certain sites due to organizational constraints. This under-enrollment will be supplemented at larger clinics by over-enrolling participants at other sites. In order to prevent possible retribution again clinic

personnel on the part of clinic leadership, we will not disclose the enrollment decisions of clinic personnel, and we will offer smoking cessation resources to the clinic.

To recruit personnel, we will use staff meetings, electronic and written communication, and hold study-specific meetings. To recruit clients, as done now (R01 CA126969), but modified as needed upon advice from the Community Advisory Council, our Research Assistants (RAs) will assess every scheduled client for interest and eligibility using clinic schedules to approach clients prior to or after appointments. We post program flyers and brochures in clinics as well. Participants who are eligible and interested in the study will be scheduled for an intake session. To assess external validity, eligible personnel and clients who refuse entry will be compared to those who enroll based on available data (e.g., smoking status, years employed, nature of SMI).

5.6 Vulnerable Populations

Population protected under HHS regulations 45CFR46 Subparts B, C, & D Study Procedures: Clients of the clinic who are pregnant at the time of baseline assessments will not be eligible for the study, as clients must also smoke cigarettes to be eligible. These women will be advised to notify the study staff if they become or intend to become pregnant during the study period. Personnel of the clinic who are pregnant at the time of baseline assessments will be eligible for the study if they confirm that they do not smoke cigarettes.

Populations vulnerable to undo influence or coercion: Educationally or economically disadvantaged persons are included but not solely targeted for recruitment. Cognitively impaired persons are not included in the current study. Because of our recruitment efforts for this study, it is possible that University of Pennsylvania employees and students may be invited to participate. Status of participation in the study will be independent of the subject's work or school activities.

The study consent will include language that informs clinic client participants that their care will not be affected if they choose not to participate in the study or withdraw after enrollment. Likewise, clinic personnel participants will be informed that they may freely choose not to participate in the study or withdraw after enrollment. The consent will be read aloud in its entirety to patient participants and clinic personnel participants. If the baseline session is being conducted remotely (over the phone or video chat), participants will then give their verbal consent. The research staff member will note in the consent form that the participant affirmed their consent, as well as the date of the consent. The consent document will also be sent to participant, either over email or through the mail. Clinic leadership will sign an informed consent acknowledgement form which states that clinic personnel employability will not be impacted as a result of research enrollment decisions.

6 Study Procedures

Table 4. Schedule of Study Procedures													
Personnel Session		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Client Session		**1**				**2**			**3**			**4**	**5**
Study Timepoint	**Pre-Baseline**	**Baseline[1]**	**Week 1**	**Week 4**	**Week 8**	**Week 12**	**Week 16**	**Week 20**	**Week 24**	**Week 28**	**Week 32**	**Week 36**	**Week 52**
SCREENING/ENROLLMENT													
CMHC Eligibility Screen (with ORIC)	X												
Clinic Leadership Informed Consent Acknowledgement	X												
Informed Consent/HIPAA		X											
Client/Personnel Eligibility Screen		X											
TREATMENT													
ATTOC			X	X	X	X	X	X	X	X	X	X	
UC			X[3]										
MEASURES													
COVARIATES													
Demographics, Smoking History & FTND (S-KAP, S-KAS)		X				X			X			X	X
Client Psychiatric History[2]		X											
Client COVID-19 Questionnaire		X											
Clinic/Clinician Change (The Dashboard)			X	X	X	X	X	X	X	X	X	X	
MEDIATORS													
Personnel Knowledge and Attitudes (S-KAP)		X				X			X			X	X
Client Knowledge and Attitudes (S-KAS)		X				X			X			X	X
TREATMENT DATA													
ATTOC Intervention Adherence (The Dashboard)			X	X	X	X	X	X	X	X	X	X	
ATTOC Change Plan			X			X							
ATTOC Environmental Scan			X			X							
ATTOC Communication Plan			X			X							
OUTCOMES													
Adherence to TUD Guidelines (S-KAP)		X				X			X			X	X
Adherence to TUD Guidelines (S-KAS)		X				X			X			X	X
Adherence to TUD Guidelines (Client Prescription Data)[2]												X	X
Client Smoking Status (CO Form)		X											
Client Smoking Status (TLFB)						X			X			X	X
Client Mental Health (BASIS-R)		X				X			X			X	X
Client QOL (SF-12)		X				X			X			X	X
Client Hospitalization Form[2]												X	X
Treatment and Client Costs		X										X	X

[1] Activities associated with this timepoint may occur any time within the 4-6 week period directly preceding Week 1.

[2] Data provided by request from Community Behavioral Health (CBH)

[3] This is a one-day training lead by Dr. Schnoll and/or Dr. Leone.

6.1 Participant Screening

A 4 to 6-week time-period was selected for participant recruitment, completion of informed consent and HIPAA documents, including clinic and participant eligibility determination and the completion of baseline assessments. This window for recruitment was selected to ensure access to all site personnel and to recruit the sample of clients. For site personnel, the site directors will distribute information about enrolling in the study via flyers and brochures and email messages. In addition, study research staff members will provide brief weekly presentations to the clinic personnel to inform them of the study. Given the support from CBH, the Alliance, the Coalition, the MHASP, and the CMHC directors, we expect a 90-100% rate of recruitment as seen in past studies [44, 94]. For clients, trained study staff will visit the clinic daily during the recruitment period and will use clinic schedules to identify prospective participants.

6.1.1 Baseline

Eligible and interested client and clinic personnel participants will complete informed consent and HIPAA documents and baseline assessments. Following receipt of informed consent and HIPAA authorization, a baseline assessment will be completed The baseline assessments will collect a broad range of data, including demographics and smoking history for both participant groups and psychiatric history data for client participants. Client participants will also complete a smoking status review (CO Form), the BASIS-R, SF-12 and a hospitalization assessment. Additionally, personnel participants will complete the Smoking Knowledge, Attitudes, and Practices (S-KAP) survey and client participants will complete the Smoking Knowledge, Attitudes, and Services (S-KAS) survey. [105]. At UC clinics, baseline assessments help ensure that any differences across UC sites at baseline can be controlled for in subsequent analyses. Compensation for the baseline session will be distributed when baseline questionnaires have been completed. For those participants (either personnel or clients) who complete the informed consent and HIPPA documents, but cannot complete the baseline assessments until a later date, payment will be deferred until baseline questionnaires have been completed. An appointment will be made with the participant to ensure that all session questionnaires are completed and compensation provided.

6.1.2 Pre-Week 1 Phone Call (ATTOC Clinics Only)

Clinic CEOs and executive directors at ATTOC randomized clinics will be asked to identify a Tobacco Champion/Leadership group that provides continual on-site advocacy and support for the change plans and culture change, including ongoing performance feedback and coaching to clinic staff. A pre-site visit video-conference (or teleconference) call with the agency champion and leadership group prepares for Week 1. During this call, the study team will inquire about clinic resources and may request written policies for review. The team will also use this time to assess the leadership's support for the study and offer recommendations for preparing clinic staff to engage in the program.

6.2 Study Intervention Phase

6.2.1 Overview of Interventions

Usual Care (UC): Sites randomized to UC will not receive an organizational intervention to address TUD treatment. To ensure standardization across UC sites, Dr. Schnoll and/or Dr. Leone will provide a 1-day training seminar that will include written materials describing recommended treatments for TUD to UC personnel consistent with established treatment guidelines. This minimal treatment condition was selected to facilitate the evaluation of the ATTOC training program on key outcomes relative to current clinical practice and organizational culture and climate. UC site personnel and clients will also be compensated for the time and effort required to complete assessments, which should also lower the risk for study withdrawal.

ATTOC Intervention: ATTOC is implemented in a systematic 3-phase process with 10 steps (Table 2) to guide sites through cultural change and implementation of evidence-based practice. ATTOC is flexible to accommodate the unique needs, barriers, resources, and goals of an agency. Each organization begins at its own starting point based on what it has already accomplished (although, from our experience, most agencies are similarly not systematically addressing TUD at baseline), so the ATTOC intervention starts with diagnosis and proceeds to intervention and evaluation, consistent with ODT. Across the steps within the phases, 7 core strategies are used: 1) Meetings, calls, and video-conferences to prepare for and implement the intervention; 2) On-site consultation and technical assistance, including an Environmental Scan and training; 3) Formation of the agency's Tobacco Champion/Leadership to support culture and practice change, including the use of a "dashboard" assessment to provide performance feedback; 4) Implementation of the agency's change plan to achieve its Client, Staff, and Environmental goals; 5) Formal training/technical assistance in the treatment of TUD at the agency with ongoing monitoring, feedback, and coaching by champions; 6) Sustained consultations, including the use of the dashboard assessment to monitor organizational change and provide performance feedback to clinicians; and 7) Web-based support. The ATTOC intervention will be implemented over 9-months via 10 sessions (as in ongoing ATTOC initiatives): 2 in-person/on-site and 8 by video-conference (or teleconference) (see: http://www.umassmed.edu/psychiatry/attoc.aspx). Due to the fact that many community mental health clinics provide fee-for-pay service, the study has budgeted up to $1,500 per site, depending on the need of the site. This compensation is meant to offset the cost associated with lost time and effort due to study participation on the part of clinic personnel.

6.2.2 Week 1

Usual Care (UC): Clinics will take part in a 1-day training session with Dr. Schnoll and/or Dr. Leone.

ATTOC Intervention: Week 1 is a 3-day on-site technical assistance and training visit for clinic personnel. Site personnel are not required to attend the entire 3-days and training sessions are divided into blocks so that normal agency functions can occur). This visit involves the following components:

- Meet with agency Executive Director/CEO to review ATTOC phases and steps, establish a shared vision, enlist support, and establish the commitment to climate and culture change (step 1);
- Meet with Tobacco Champion/Leadership Group to establish a collaborative and shared plan for training and culture change that is consistent with ATTOC and the needs of the individual agency (step 2);
- Perform an Environmental Scan (step 3), which includes meeting with agency leaders, staff, and clients for a baseline organizational assessment, providing realistic targets for change across 3 domains: 1) the client-level assessment evaluates client flow, clinical charts, and use of current tobacco treatment, 2) the staff-level assessment evaluates staff smoking and treatments available to staff, level of prior training on TUD, and staff attitudes/beliefs towards this initiative and TUD treatment; and 3) the environmental assessment evaluates the indoor and outdoor spaces of the agency for evidence of tobacco use, available literature to support TUD recovery, and agency policies. The Environmental Scan includes a walk-around the facility, interviews with staff and clients, and chart reviews to assess documentation of tobacco use and treatment. This evaluation creates a baseline assessment of the core goal areas for the ATTOC intervention, helps assess organizational readiness, and provides important information for the Change Plan (step 4). A central feature of ATTOC is the “dashboard”, a formal comprehensive measure with indices of each aspect of the Environmental Scan, such as existing policy and adherence to TUD clinical guidelines. Subsequent dashboard assessments are used by the agency Champion/Leadership and ATTOC consultants to gauge progress and guide performance feedback.
- Written Change Plans and time-lines are provided based on the Environmental Scan and the initial dashboard assessment, material required for change is prepared, and a written communication plan is provided which guides efforts to promote culture change (steps 4 and 5);
- The implementation of the change plans, involving clinical training, TUD treatment service development, and environmental changes, is initiated (steps 6-8). The specific beliefs that may pervade the agency and undermine willingness to treat TUD are articulated and addressed. The potential effect of staff tobacco use is discussed and treatment options are provided. Consultants then work with the agencies to modify existing EHRs to ensure assessment of TUD, documentation of treatment plans, and recording of follow-up assessments. TUD assessments include self-report [97] and CO monitors (provided to agencies), the latter of which can be used to verify self-report, motivate and reinforce change, and evaluate treatment progress.
- Although only one strategy within the ATTOC model (to build capacity), agency staff are given formal training in the assessment and treatment of TUD, with a focus on integrating TUD treatment within existing wellness programs. Training content is based on USPHS guidelines [20] and supplemented with population specific studies (e.g., [12]). The ATTOC training includes tailored approaches for the target population based on varying levels of motivation and mental illness, including prescriber education. Dr. Ziedonis has authored national guidelines on TUD treatment in this population and currently leads a national initiative by the APA, which will inform training. Dr. Eden Evins will consult on this training since she has developed formal treatment recommendations, from her own clinical trial work in this area and the work of others, to devise best practice recommendations for smoking among those with SMI, which consider personalized treatment based on client diagnosis, current psychiatric medications, and residual symptom profile. This training content will be built upon the content already provided focusing on the specific needs of smokers with SMI (e.g., anhedonia and cognitive deficits) and on studies with this population that support unique treatment approaches (e.g., more intense and extended treatments; [85]. Drs. Evins and Ziedonis will refine training content for in-person and web-based training. Evidence-based behavioral interventions and FDA approved TUD medications that can be tailored appropriately for those with SMI are described [20]. (Note. As Medicaid participants, all clients in this trial are eligible for no-cost pharmacotherapy and counseling for their TUD; employees are eligible for no-cost NRT and counseling.) Combining TUD medications to improve efficacy is discussed as is the importance of combined behavioral and pharmacological treatments. Tailoring treatment based on the client’s level of quit motivation is emphasized. Treatment options for less motivated clients, based on USPHS guidelines, include providing use of the LAHL guide and motivation interventions (the 5R’s: Relevance, Risks, Rewards, Roadblocks, Repetition). Assessment and promotion of treatment adherence is emphasized and a medical management approach to enhancing treatment compliance, which formally assesses reasons for non-adherence using scenarios and uses specific strategies to enhance compliance (see [98]), is taught. While e-cigarettes may be safer than combustible tobacco, the lack of product regulation and data on their ability to promote tobacco cessation, support ATTOC’s training that encourages abstinence from all tobacco products and use of only FDA-approved TUD medications. Key assessments (e.g., triggers) are taught. Advanced trainings are provided (e.g., “train the trainer”) to promote sustainability. The ATTOC team empowers the tobacco champion/leadership team to continue training and culture change through ongoing support/assistance.
- Lastly, assistance with the establishment of a tobacco-free workplace and campus is initiated if that is an organizational goal. This involves setting a date for campus change, including development of staff communications, appropriate signage, treatment support, and trouble-shooting potential obstacles. Some agencies may choose to restrict use to an isolated campus location.

6.2.3 Weeks 4 and 8

Usual Care (UC): No study procedures are completed.

ATTOC Intervention: Sessions at Weeks 4 and 8 are provided via video-conference (or teleconference) to continue training activities initiated in Week 1 and address concerns, obstacles, or problems that have emerged during implementation. Agency staff is provided with access to an interactive web-site administered by Dr. Ziedonis, which provides information, tools, and materials for training and treatment. Site tobacco champions are instructed in using the "dashboard" assessment of clinician and agency performance, relative to benchmarks, in order to provide formal performance feedback.

6.2.4 Week 12

Usual Care (UC): Participants complete assessments. Clinic personnel will complete the S-KAP and clients will complete the S-KAS, which allow for exploratory mediation analyses. These ~30 minute assessments will be conducted in person at the sites by the trained study staff.

ATTOC Intervention: This 2-day on-site visit to conduct a follow-up Environmental Scan evaluates early changes in outcomes and provides further training and technical assistance. During this visit, dashboard data are used to provide performance feedback to site personnel. The feedback: 1) reviews the change and communication plans, including the benchmarks for adherence to TUD treatment guidelines; 2) presents a graphical display of clinician adherence to treatment guidelines; and 3) offers coaching for clinicians with unacceptable adherence and positive reinforcement to clinicians with acceptable adherence. Data support performance feedback for improving clinician use of evidence-based treatment [99], even for TUD [100], but this will be the first time this technique is used to address TUD treatment in community mental healthcare. Participants will also complete assessments. Clinic personnel will complete the S-KAP and clients will complete the S-KAS, which allow for exploratory mediation analyses. These ~30 minute assessments will be conducted in person at the sites by the trained study staff.

6.2.5 Weeks 16 through 52

Usual Care (UC): No study procedures will be performed at Weeks 16, 20, 28, or 32. At Week 24, clinic personnel will complete the S-KAP and clients will complete the S-KAS, BASIS-R, and SF-12. At Week 36 (EOT) and 52, clinic personnel will complete the S-KAP and clients will complete the S-KAS, BASIS-R, SF-12, hospitalization assessment and smoking status review (self-reported TLFB and CO reading). Treatment and client costs will also be assessed as one of the outcomes variables measured at Week 36 and 52.

ATTOC Intervention: Sessions spanning weeks 16 through 36 are provided via video-conference (or teleconference) to assess dashboard data, reinforce training initiated in past sessions, and address concerns or obstacles that emerged during implementation. Formal performance feedback (based on dashboard data) to the clinics is again provided. Updated policies and SOPs are given to staff (step 9). These "booster" sessions to continue performance feedback promote sustainability of organizational change (step 10).

Assessments will occur at weeks 1 2 and 24 to facilitate the performance feedback (e.g., clinical practices, barriers, client smoking) and to allow for exploratory mediation analyses using the S-KAP and S-KAS surveys. These ~30 minute assessments will be conducted in person at the sites by the trained study staff.

At Week 24, clinic personnel will complete the S-KAP and clients will complete the S-KAS, BASIS-R, and SF-12. At Week 36 (EOT) and 52, clinic personnel will complete the S-KAP and clients will complete the S-KAS, BASIS-R, SF-12, hospitalization assessment and smoking status review (self-reported TLFB and CO reading). Treatment and client costs will also be assessed as one of the outcomes variables measured at Week 36 and 52.

At Week 36 (EOT), ATTOC clinics will be congratulated on completing the program with certificates of completion. Both individuals participating as personnel, in addition to the clinic as a whole, will be awarded these certificates. Clinic personnel will be notified that they will be able to contact Dr. Ziedonis with any follow-up questions or concerns. In addition, ATTOC clinics will be given the option of receiving information about other area ATTOC clinics, to allow for communication and collaboration between them.

6.3 Session Windows

Intervention treatment sessions for clinic personnel will occur +/- 1 week from the study timeline date to account for scheduling needs of clinics and trainers. In-person ATTOC sessions at Week 1 and 12 may be scheduled +/- 2 weeks from the study timeline date as travel arrangements must be made for the UCSD study team. If a personnel participant at an ATTOC randomized clinic is not available to attend any interventional study session (Weeks 1-36), the intervention will not be repeated for individuals.

Personnel participants who miss an assessment session or are unable to complete an assessment within the allotted session time are afforded a +/- 1 week study window to complete the assessments by phone. If there are extenuating circumstances that would cause personnel participants to miss a study session (e.g., end of an employment period), personnel sessions may be

completed earlier than the +/- 1 week session window. All client participant assessments will have a window of +/- 1 week to complete treatment and outcomes assessments for weeks 12, 24, 36, and 52. Participants may choose to complete the assessments in person or by phone.

Session windows may be extended with prior authorization from PI at his discretion. Session window extensions will not be considered reportable deviations.

6.4 Subject Withdrawal

Clinic personnel or client participants may choose to withdraw from the study at any time. They do this by providing verbal or written communication to this effect. Withdrawal from the study will not impact employment status (clinic personnel) or access to care (clinic clients) within the clinic. The Principal Investigator may withdraw subjects who violate the study plan, to protect the subject for reasons related to safety or for administrative reasons. It will be documented whether or not each subject completes the study. Subjects who withdraw early will be contacted to complete a final visit (Week 52) to collect final evaluations and assess adverse events.

To increase retention and adherence we will: 1) conduct interventions at the clinic; 2) conduct assessments during scheduled clinic visits or by phone; and 3) as is standard in TUD trials [65, 66], provide financial compensation for assessment completion. Although we expect that a small percentage of personnel and clients will leave their agencies, based on our past trials [71] and preliminary research with DoH clinicians [19], we expect that <15% of personnel and clients will withdraw from the trial or be lost-to-follow-up and ~85% of assessments will be completed, which exceeds past trials (e.g., [102]). As is advised in smoking cessation trials [101], intent-to-treat (ITT) will be used for Aim 2. Should, in the unlikely event, a CMHC withdraw from the trial, our time-line and prospective recruitment will allow replacement with a new CMHC.

7 Statistical Plan

All data are maintained on password-protected computers within a DMS that uses ORACLE and MS ACCESS to permit web-based real-time data entry, storage, and QA

7.1 Sample Size and Power Determination

For cluster-randomized designs, clinic is the unit of randomization and the unit of analysis is the individual. Power is reduced by variability among clinics, represented by the intra-class correlation (ICC), analogous to an R-squared. The size of the individual sample affects precision within clusters and certain outcomes are less susceptible to potential confounding vs. others (e.g., smoking rates vs. provider adherence) since they are more independent.

For Aim 1, the analysis will compare ATTOC to UC on weeks 36 (EOT) and 52 rates of adherence to guidelines for treating TUD. The sample size was determined by assessing the mean change in practice behavior detected in Guydish et al. [18]. Given the expectation from that trial that the UC mean level of practice will be 2.36 (SD=.87), the present sample of N=14 agencies (with 280 subjects) provides 80% power (α=.05) to detect an effect if practice behavior increases by 0.32 (on a 5-point scale) if the ICC is 0. But if our ICC is .05, .10, or as high as .15, we have 80% power (α=.05) to detect a difference between ATTOC and UC of 0.44, 0.54, and 0.62, respectively. If 15% of the personnel are lost-to-follow-up, we will have 80% power (α=.05) to detect an effect if practice behavior increases by 0.34 for ICC=0, by 0.46 for ICC=.05, by 0.56 if ICC=0.10, and by 0.63 if ICC=.15. The effects of ATTOC were stronger at the 3-month follow-up (mean change of 0.51), vs. EOT [18], so the current power is adequate for both time-points. Likewise, because the client sample will be more than twice as large as the clinic staff sample, we will have greater than 80% power to detect differences using the measure of physician adherence collected from clients.

For Aim 2, the analysis will compare the rates of smoking cessation between the ATTOC intervention and UC at weeks 36 and 52. We can expect that UC cessation rate will be < 2% [18]. With 14 sites (n=700 clients, ITT), we have 80% power (α=.05) to detect a difference between ATTOC and UC of 4% with an ICC=0. But if our ICC is .05, .10, or as high as .15, we have 80% power (α=.05) to detect a difference between ATTOC and UC of 10%, 15%, and 19%, respectively, with 14 sites and n=700 client (ITT).

For Aim 3, the analysis will use non-inferiority testing to compare mental health and QOL across ATTOC and UC at weeks 36 and 52. Standard statistical tests, which may yield a non-significant comparison of means or proportions, cannot be used to claim that the treatments are equal since “the absence of evidence is not evidence of absence”. Among persons with SMI, the rate of psychiatric hospitalization nationally is 11.4% [114], which may represent UC (i.e., 88.6% of UC subjects will not have a hospitalization across the 52 weeks). One study found that 3.3% of clients with an SMI treated for TUD had a psychiatric hospitalization [48] or that 96.7% of clients treated for TUD did not experience a psychiatric hospitalization. We assume 14 sites (700 clients), with potential loss of 15% to follow-up, and assume approximately 90% non-hospitalization in the UC group. We will set our non-inferiority floor 20% below the US rate, which yields 80% power to detect non-inferiority if the ICC is as much as 0.15 (more power if ICC is less than 0.015).

A trial with smokers with an SMI reported baseline BASIS-R scores of 2.1 (SD=0.8) and SF-12 scores of 48.7 (SD=12.5) for the physical sub-scale and 27.8 (SD=12.9) for the mental sub-scale, which estimates UC [107]. Given the sample of 14 sites (700

clients) and potential 15% loss to follow-up, we have 80% power (α=.05) to detect non-inferiority if the results for the ATTOC arm differ from UC by as much as 0.19 on the BASIS-R, when ICC=0, and by 0.50 when ICC=0.15.

7.2 Statistical Methods

We will assess sample characteristics by treatment arm and site with chi-square or regression. These variables will also be examined for their relationship to completion of outcomes. Variables related to treatment arm or completion of follow-ups (p<.10) may be covariates in analyses. Fidelity and adherence measures will be evaluated across treatment arms, and the measures can be included in primary analyses. We will examine if the rate of missing data is related to a range of variables using chi-square and regression and use appropriate methods for dealing with missing data (e.g., [115]). Analyses will assume that all subjects for whom smoking outcome data are unavailable are smokers (ITT) but we can also conduct a "completers-only" analysis. Because this is a cluster-randomized trial, the observations within a cluster cannot be considered totally independent. Variation among clusters may be confounded with treatment because clusters are nested within treatment. We will account for this clustering using hierarchical linear models (mixed models), estimating separate variance components for random site effects within treatment. Lastly, since we cannot guarantee that clinicians will be blind to their clients enrolling in this study, we will include a statement in personnel consent forms asking that they refrain from asking their clients if they are enrolled in the study.

7.2.1 Analysis of Outcomes of Interest

The effects of the ATTOC model on provider adherence to guidelines for treating TUD: We hypothesize that the ATTOC intervention will increase adherence to guidelines for treating TUD vs. UC. The outcome is continuous and the hypothesis will be tested by a treatment arm term in a mixed-models linear regression model that may include covariates. Mixed models may account for individual level clustering inherent in longitudinal studies and site level clustering. Outcomes of the analysis will be characterized by regression coefficients and confidence intervals. Significance will be determined from a z-score corresponding to the treatment variable. Although level of adherence at 36 and 52 weeks will represent our primary outcome variables, similar regression analyses will be performed for assessments at Weeks 12 and 24. Also, we can examine models of specific clinician practices (e.g., identifying smoking, recommending pharmacotherapy) and examine adherence from the client perspective and based on adherence data ascertained from the EHR.

The effects of the ATTOC model on client smoking: The hypothesized effect of treatment arm (i.e., the difference in quit rates between subjects receiving the ATTOC intervention or UC) will be tested by a treatment arm term in a mixed-models logistic regression model with covariates. Outcomes of the analyses will be characterized by odds ratios (e.g., odds of quitting smoking) and 95% confidence intervals. Although quit-rates at the end of 36 and 52 weeks will represent our primary outcomes, similar analyses will be performed for other assessments of quit rates (e.g., at Weeks 12 and 24). In addition, as many participants will fail to become abstinent, we will explore the use of zero-truncated negative binomial regression for count data to examine the main effects of treatment arm on changes in smoking rate at all assessment time-points.

The effects of the ATTOC model on client mental health functioning and QOL: We will compare treatment arms in terms of the frequency of hospitalizations (binary) and mental functioning evaluations (continuous) over 52 weeks. Again, we will use mixed models to account for clustering, while accommodating either the binary outcome with logistic regression or the continuous measures with linear regression. Equivalence uses two one-sided tests against lower and upper equivalence bounds. The null hypothesis is that the groups are not equivalent and are determined to be equivalent when the mean or proportion is significantly different from both boundaries. We will use this approach to determine whether hospitalization rates are higher (null) in the ATTOC group or equivalent, and whether mental functioning is lower in the ATTOC group (the null) or equivalent. All hypotheses will be tested at alpha=0.05 (0.025 for any one sided non-inferiority test).

The cost-effectiveness of the ATTOC program vs. UC: We will compare the societal cost (i.e., the sum of all measured categories of costs, including treatment and indirect costs) and effects of ATTOC vs. UC. If one treatment is found to be more costly and more effective, there is a trade-off between the additional effectiveness and additional resources needed to achieve those outcomes. This trade-off is represented by the incremental cost-effectiveness ratio (ICER), which is a ratio of the difference between mean costs in each treatment group and the difference between the cessation rates across treatment arms at weeks 36 and 52. This ratio will represent the additional cost of ATTOC vs. UC to produce an additional quitter. The quit rate outcome measure is used in our primary measure of cost-effectiveness because it is measured directly and because it can be compared against economic evaluations of other smoking interventions. Hypothesis testing for an ICER involves determining whether the ICER is significantly < the maximum acceptable ICER. Unfortunately, the maximum willingness to pay for a quit is unknown. However, $50,000 is accepted as a maximum ICER for the outcome of cost/life year saved, but wide bands around this value are common. This outcome looks at cost-effectiveness of the intervention over a lifetime. Because this is a relatively brief trial we will use a simulation-based analysis to project effects of quitting into long-term mortality and costs [116], employing standard assumptions and parameters [117]. Because this projection is based on parameters that have wide ranges, we will conduct a sensitivity analysis to assess the sensitivity of our estimates of costs and cost-effectiveness to the speculative nature of some of the values used in the analysis. We will consider how cost-effectiveness may change with different: 1) costs of treatment; 2) methods to handle attrition of cost data; and 3) ceiling ratios. Because of the poor statistical properties of the ICER as with ratios [118], we will transform the ratio into incremental net monetary benefits (INMB) with the following: [L*E]-C where L=ceiling ratio, E=difference in mean effects, and C=difference in mean costs. The hypothesis test that the ICER is < the ceiling ratio is equivalent to the hypothesis test that the INMB is >0. The INMB standard error is estimated with the formula in Willan [119] and amounts to the typical statistical formula for standard error. The hypothesis is that the ICER will be cost effective if the

INMB expression of cost/life year saved is >0 at an α <0.05. We will also judge the cost-effectiveness ratio as being acceptable if the confidence interval for the INMB excludes 0.

Exploratory Aims: The effects of treatment arm on potential mediators (barriers) will be assessed using linear regression-based structural equation modeling (SEM). It is hypothesized that treatment arm will yield significant differences in proposed mediators which will predict week 36 and 52 quit rates and adherence to treatment guidelines. We will examine changes in mediators from baseline to week 8. After first demonstrating that treatment arm affects adherence and quit rates (Aims 1 and 2), these effects will be partitioned into mediated and unmediated effects, via path analysis and SEM. Specific hypotheses will be tested by using chi- square difference tests that contrast the overall fit of this full model with more parsimonious nested models in which specific predictive effects are fixed to zero (e.g., an unmediated path). Model goodness-of-fit indices will be contrasted to guide interpretation of results and determine the practical significance of statistically significant differences. Modification indices will be examined to guide model interpretation and modification and binary and continuous variables can be handled by Stata. This approach allows us, in principle, to test whether treatment effects on Aim 1 and 2 outcomes are due to specific mechanisms (e.g., reduction in barriers).

Given the necessary complexity of the ATTOC intervention to promote broad, sustainable organizational change, we will use SEM to identify and measure the key elements of ATTOC related to improved outcomes (clinician behavior and client smoking) as has been suggested [18]. We will use the ATTOC Intervention Adherence Tool (i.e., "The Dashboard") to determine each site's compliance with ATTOC's steps (e.g., the selection of a site champion, the preparation of change and communication plans, the implementation of change plans including SOPs, the provision of TUD treatment, the establishment of a smoke-free campus or progress in establishing smoking restrictions). First, we can use SEM with binary predictors (e.g., identified a tobacco champion or not) to determine the relative impact of implementing each ATTOC element so that policy-makers can select a smaller, more manageable number of organizational change elements within ATTOC to implement; this may be especially relevant for disseminating ATTOC to sites which already successfully perform certain aspects of ATTOC already. Second, we can use SEM again to calculate the individual and combined impact of implementing ATTOC elements on outcomes, analogous to determining the "dose" effect of implementing various levels of ATTOC. These analyses will help policy-makers know the likely size of effects from implementing various ATTOC elements and make decisions about what their agency requires.

8 Safety and Adverse Events

8.1 Data Safety Monitoring Plan (DSMP)

For this study, we will use established PENN procedures and infrastructure for data and safety monitoring. During the course of the study, safety and data quality monitoring will be performed on an ongoing basis by the Principal Investigators and the study staff. Study staff members are responsible for collecting and recording all clinical data using the established MOP. This includes ensuring that all source documents exist for the data on the Case Report Forms, ensuring all fields are completed appropriately, and ensuring that all corrections are done according to Good Clinical Practice (GCP). Any inconsistencies/deviations will be documented. The study Key Personnel, which include physicians (Leone) and psychiatrists (Ziedonis), will review data on an ongoing basis and will document reviews by initialing and dating reports. Study staff members conduct 100% quality assurance on data, comparing all hard copy data to computer files.

Staff training will consist of an explanation of the protocol and review of the Case Report Forms. In addition, the duties of each staff person will be outlined and all applicable regulations will be reviewed. Mock sessions with critical feedback will be conducted. The MOP will be used for staff training and to guide procedures throughout the trial. Senior personnel will supervise junior staff and provide re-training in the study protocol as needed. Dr. Ziedonis will oversee the staff implementing the ATTOC intervention and Drs. Schnoll and Leone will oversee the staff handling recruitment and data collection and management.

Enrollment will be complete when 280 personnel and 700 clients are consented and complete the study. Monitoring days will be conducted periodically throughout the study. The monitoring is conducted by the PENN IRB and the PENN Office of Human Research (see www.med.upenn.edu/ohr). These audits are typically conducted annually and involve the review of regulatory documents, the ascertainment and documentation of informed consent, the compliance with the study protocols, and the completion of CRFs.

Monitoring for Adverse Events (AE) will be conducted by the study staff and the PI and co-investigators. Study staff will administer standardized assessments to evaluate mental health and QOL (BASIS-R and SF-12, respectively). Participants will be queried to provide open ended descriptions of any adverse event which occurred since the previous assessment.). Should a report rise to the level of a potential Adverse Event, the decision on the course of action for the participant will be decided by Dr. Leone after review of the report. Participants will be monitored for the development of adverse events by administering these scales at 5 time-points during the study. In addition, both personnel and clients will be given contact information should they need to reach a member of the study between assessment time-points. The Research Team will clinically follow all subjects who are discontinued due to a serious adverse event until it resolves and becomes completely stable, unless a referral to another physician (i.e., specialist) is clinically indicated or requested by the subject. All AEs and SAEs will be documented on an Adverse Events Case Report Form. This information will, in turn, be reported immediately to all necessary regulatory committees. All serious adverse events will be reported within 24 hours to senior study staff. These events will be maintained in a unique data base and reviewed monthly by senior study staff.

Ms. Ware and staff RAs will be responsible for monitoring data integrity as data are collected. This includes ensuring that source documents exist for the data on the Case Report Forms, ensuring all fields are completed appropriately, all corrections are done according to GCPs and any inconsistencies/deviations are documented.

8.2 Internal Monitoring and Auditing

The study will be monitored by the PIs and co-investigators, and regulatory committees at PENN (i.e., IRBs, OHR) as well as by a Community Advisory Council and the Philadelphia Department of Public Health Institutional Review Board. The following monitoring activities will be conducted according to standard operating procedures. These activities will be performed in association with database auditing and facilities monitoring by the PENN OHR and/or study staff.

Initial Assessment Monitoring: PENN OHR will conduct a manual review of source documents and Case Report Forms (CRFs) for a random subset of participants enrolled in the study. This inspection is the visual comparison of source documents to CRFs in a quantitative assessment of accuracy based on the number of data fields. A brief, internal report will be generated to describe findings. If the data are less than acceptable, additional cases are requested, with appropriate counseling/training for staff.

Protocol Monitoring: Protocol monitoring includes a survey of those activities that are associated with protocol adherence such as study visit deviation and violation of inclusion/exclusion criteria. A specific protocol monitoring plan will be used. All accrued cases will be subjected to protocol monitoring throughout the duration of the trial.

Database Auditing: Ms. Ware and RAs will review data entered into the database versus that recorded on the CRFs. All accrued cases will be subjected to database auditing throughout the duration of the trial. Depending on the data management findings, re-training will be provided, should problems such as increased errors be detected.

Data Auditing: Ms. Ware and staff RAs will review safety data recorded on the CRF versus that contained on the actual source document (client chart, EHR). All accrued cases will be subjected to auditing throughout the duration of the trial. A Regulatory Binder Review by OHR will include the following essential documents: IRB Protocol, Consent Form and Amendment Approvals, IRB Closure Letter, List of Authorized Signatures, Laboratory Certifications, Protocol and Amendment Signature Pages, Financial Disclosure Questionnaires, and Monitoring Log. Additional monitoring by OHR may include: source documentation verification; adverse event documentation; and facility assessment.

Data Security: Using network firewall technologies, the database will prevent the three major sources of data security problems: unauthorized internal access to data, external access to data, and malicious intent to destroy data and systems. Controlled user access will ensure that only appropriate and authorized personnel are able to view, access, and modify trial data. All modifications to data will document user access and data associated with the modification, as well as values prior to modification.

IRB Monitoring: The protocol will be reviewed by the PENN IRB and will only be implemented after successful approval from the IRB. Annual reporting and auditing will be conducted by the IRB. All procedures will be approved by the IRB. A protocol-specific Data Safety Monitoring Board will be used for this trial as well (see below). The PENN IRB will ensure participant safety and data integrity in collaboration with the DSMB and the Community Advisory Council.

Evidence of Training in Human Subject Research: All personnel working on this project will be required to review the protocol, complete training in the protection of human subjects (developed and implemented by the PENN and NU IRB), and undergo training.

The investigator will permit study-related monitoring, audits, and inspections by the EC/IRB, the sponsor, government regulatory bodies, and University compliance and quality assurance groups of all study related documents (e.g. source documents, regulatory documents, data collection instruments, study data etc.). The investigator will ensure the capability for inspections of applicable study-related facilities (e.g. pharmacy, diagnostic laboratory, etc.). Participation as an investigator in this study implies acceptance of potential inspection by government regulatory authorities and applicable University compliance and quality assurance offices.

8.3 Reporting of Adverse Events and Unanticipated Problems

The Investigator will promptly notify the Penn IRB of all on-site unanticipated, Adverse Events that are related to the research activity. Other unanticipated problems related to the research involving risk to subjects or others will also be reported promptly. Written reports will be filed using the HS-ERA and in accordance with the Penn IRB timeline of 10 working days.

9 Study Administration, Data Handling and Record Keeping

9.1 Confidentiality

Since self-report and medical data will be collected and stored as part of this study, it is possible that subject privacy or confidentiality can be threatened. To address this concern, the Data Management System has set up several safeguards to prevent unauthorized access to study data. An automatically generated index number is assigned to a subject's study

identification number (unique for personnel and clients). A linked subject identification table is created for the storing of subject name, address and telephone contact information. This table uses the automatically generated index number rather than the study identification number. The master subject map and subject identification information tables are maintained in a separate database. Using this method, no identifying subject information is directly linked to medical information or other study data. For our multi-site trials, we have long-established protocols to guard against improper use of hard copies of data (e.g., locked files, numeric coding procedures). The present research team has not experienced the unauthorized use of study data. A web-based data collection procedure will minimize the possibility of loss of privacy or confidentiality. The risk of a potential breach of confidentiality is addressed in the informed consent documents.

9.2 Sources of Research Material

- Questionnaires assessing demographic characteristics, smoking history and behaviors, nicotine dependence (among smokers) among personnel and clients; employment characteristics (e.g., type of position, duration at agency) among personnel; System and cultural barriers to the provision of nicotine dependence treatment (among personnel); Fidelity measures to assess implementation of the ATTOC intervention (among personnel); Questionnaire assessments of client mental health and QOL
- Past and current psychiatric diagnoses, including duration of illness and frequency of hospitalizations, and compliance with agency appointments (among clients) is collected by self-report. Diagnosis and hospitalization information is verified via data requested from CBH
- Prescription data is requested from CBH (clients)
- Treatment metric data entered by ATTOC personnel participants via online “Dashboard”
- Change Plans documentation and progress notes and ATTOC consultant environmental scan visual surveying
- Self-reported smoking behavior is bio-verified with CO samples using Vitalograph CO monitors (clients)

9.3 Computers and Databases

Key personnel at PENN have personal computers linked to a common computer server within the PENN CIRNA. The CIRNA maintains a LAN to allow for remote access to common software and computer files. This LAN maintains all necessary communications, word-processing, and data management systems (DMS). Data (for all studies, including the one proposed here) are maintained on password-protected computers and are maintained on a DMS overseen by Ms. Ware. The DMS uses ORACLE and MS ACCESS to permit real-time data entry, storage, and QA by web-based access and scannable forms, which increases standardization. We have >10 years of experience with this DMS for similar trials. The DMS constructs semantic constraints on fields, and is used for data entry, storage, retrieval, and security. The DMS uses visit dates (e.g., Baseline, Week 1, Week 52) to list procedures and measures to be ascertained. The DMS mimics the appearance of CRFs completed at visits. Each visit date is “mile-stoned” (e.g., completed, scheduled, missed). During data entry, validation occurs via built-in mechanisms (e.g., Range Checks - data range restricted). Daily backups occur to protect against corruption or deletion. Protection of privacy is ensured by: minimizing use of identifying information, use of ID numbers vs. names, keeping all data in locked files, and restricting access to the dataset linking names with ID numbers. Currently, this DMS is used for several multi-site smoking cessation clinical trials (e.g., R01 DA025078; R01 CA165001). This web-based DMS allows for the simultaneous running of the trial at multiple sites using standardized systems. The same system will be used for the proposed trial.

10 Ethical Considerations

10.1 Risks

The proposed trial will test a training intervention designed to address organizational- level change to promote improved treatment of nicotine dependence. Implementation of the training program, and the measures required to evaluate impact, are associated with the risks that are described below.

Training: Some personnel may experience frustration or concern about the need to address their agency’s approach to treating nicotine dependence. There may be some discomfort in discussing issues surrounding attempts to improve agency practices and addressing organizational climate and culture which serve as barriers to improvement. Study staff who have a great deal of experience working with organizational change initiatives such as this, as well as psychiatric populations, can manage these cases should they arise.

Assessments: Some participants may experience some emotional distress during the assessments since these measures assess agency culture and climate (for personnel) and mental health (clients). In our experience, these events happen very rarely and in almost all cases are short-lived and of low intensity, lasting for 1-2 weeks. Study staff who have a great deal of experience working with organizational change initiatives such as this, as well as psychiatric populations, can manage these cases should they arise.

Threats to Privacy/Confidentiality: Since self-report and medical data will be collected and stored as part of this study, it is possible that subject privacy or confidentiality can be threatened. To address this concern, the Data Management System has set up several safeguards to prevent unauthorized access to study data. An automatically generated index number is assigned to a subject’s study identification number (unique for personnel and clients). A linked subject identification table is created for the storing of subject name, address and telephone contact information. This table uses the automatically generated index number rather than the study identification number. The master subject map and subject identification information tables

are maintained in a separate database. Using this method, no identifying subject information is directly linked to medical information or other study data. For our multi-site trials, we have long-established protocols to guard against improper use of hard copies of data (e.g., locked files, numeric coding procedures). The present research team has not experienced the unauthorized use of study data. A web-based data collection procedure will minimize the possibility of loss of privacy or confidentiality. The risk of a breach of confidentiality is addressed in the informed consents.

10.2 Risk Minimization

The following methods will be employed to minimize participant risk.

Oversight and Monitoring: The PENN IRB will monitor the protection of human subjects and the safe and secure collection and storage of data. This committee assesses all studies before study initiation and then reviews protocols annually. The committee ensures the scientific, technical, and statistical soundness of the research and guarantees that methods for the ethical and safe treatment of human subjects are in place. The committee scrutinizes the scientific and ethical aspects of protocols and provides for an objective and ongoing assessment of the study's scientific and ethical integrity. We will comply with all of the data and safety procedures outlined in the Data Safety Monitoring Plan and will seek regular recruitment advice from our Community Advisory Council.

Minimization of Training and Assessments Risks: If during training or upon assessments, a participant exhibits significant frustration or concern, Key Personnel on the Research Team (Schnoll, Leone, Ziedonis, Neimark, or Mandell) will work with the participant to ensure that their concerns are appropriately addressed. Dr. Ziedonis and his team have the experience and skill needed to ensure that any serious concern expressed by personnel is adequately addressed in a way that minimizes any risk to the participant; this may include a private meeting with the participant or additional assurances that the agency is committed to understanding and working with the participant's concerns. Additionally, should any assessment trigger any distress among clients or personnel, Key Personnel will be available to mitigate and resolve this concern in a way that reduces participant risk, including explaining the rationale behind measures and providing additional support for mitigating the source of the distress.

Quality Assurance Procedures and Participant Confidentiality: All subjects will be screened for eligibility using formal study forms and the Principal Investigator will regularly audit accrual to ensure that participants meet eligibility criteria. In addition, the Study Coordinator will audit all study files to ensure that questionnaires completed by subjects contain all items. Lastly, to protect confidentiality, all data will be numerically coded and information linking the numeric code to the subject's name will be kept in a secured file cabinet and office. In addition, computer data files will be stored on password-protected computers and communication among the staff will use participant code numbers, not names. No information concerning data will be presented with participant names. Data will be collected in a private room or via telephone.

Undue Influence/Coercion and Enrollment Status: In order to protect personnel participants from possible undue influence and coercion regarding enrollment in our study, the voluntary nature of the study is stressed throughout the informed consent documents. With regard to clinic leadership, we assess their willingness to ensure that personnel employability will not be affected at the time of pre-enrollment (within the ORIC assessment), and we ask a designated clinic leader to sign an informed consent acknowledgement form. This document asks the clinic leader to acknowledge that s/he has read and approved the consent form and agrees on behalf of the clinic to reduce undue influence due to employability risks. This signed form will be presented to clinic personnel at the time of informed consent to address this potential concern. The consent will also state that the study team cannot conceal personnel enrollment decisions after the study treatment phase is initiated. If the clinic is disqualified during the enrollment period due to under-enrollment, personnel enrollment decisions will not be disclosed to clinic leadership.

Adverse Event Reporting: In accordance with NIH and IRB guidelines, this protocol will employ the following mechanisms for adverse event reporting: 1) alert the IRB of any and all reports of serious adverse events; 2) informing all members of the study team of any and all reports of serious adverse events; and 3) notification to NIH of any actions taken by the IRB with regard to data safety monitoring.

10.3 Benefits

Summarize the potential benefits, if any, from trial participation. Benefits should be broken down into those, which are direct benefits (to the subject directly from participating) and indirect benefits (benefits to individual or society as a hole in the future).

10.4 Risk Benefit Assessment

The potential benefits of this study outweigh the potential risks. Individuals with serious mental illness (SMI) have exceedingly high rates of tobacco use and salient system and cultural barriers within mental healthcare organizations impede effective care. This will be the first controlled, randomized trial to evaluate the effects of the ATTOC model on clinician adherence to treatment guidelines, client smoking, and client mental health and QOL. If this approach is shown to be effective and safe, it can serve as a model for the nation's community mental healthcare infrastructure, representing a powerful initiative to address tobacco use in an under-served sub-group of smokers, and support efforts to attain the Healthy People 2020 goals regarding tobacco use.

10.5 Informed Consent Process / HIPAA Authorization

Subjects will hear a study description where all study procedures, risks, and information about the study medication will be reviewed. Subject questions will be answered. The consent will be read aloud in its entirety to patient participants and clinic personnel participants. Following this presentation, the combined informed consent and HIPAA form will be completed by client or personnel participants. Personnel participants will review an informed consent acknowledgment form sign by a clinic leader and will complete a consent form. If the baseline session is being conducted remotely (over the phone or video chat), participants will then give their verbal consent. The research staff member will note in the consent form that the participant affirmed their consent, as well as the date of the consent. The consent document will also be sent to participant, either over email or through the mail.

Information about study subjects will be kept confidential and managed according to the requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Those regulations require a signed subject authorization informing the subject of the following:

- What protected health information (PHI) will be collected from subjects in this study
- Who will have access to that information and why
- Who will use or disclose that information
- The rights of a research subject to revoke their authorization for use of their PHI.

In the event that a subject revokes authorization to collect or use PHI, the investigator, by regulation, retains the ability to use all information collected prior to the revocation of subject authorization. For subjects that have revoked authorization to collect or use PHI, attempts should be made to obtain permission to collect at least vital status (i.e. that the subject is alive) at the end of their scheduled study period.

The following personal health information will be collected as part of this study:

1. Name
2. Address
3. Date of Birth
4. Phone number(s)
5. Electronic mail address
6. Social Security number (W-9 Form)
7. Medical record number
8. Pharmacy prescription information
9. Dates of procedures and events (such as hospital admissions and discharges) relevant to side effect and adverse event reporting

The following individuals and organizations may use or disclose personal health information:

- The Principal Investigator (PI) and research staff
- The University of Pennsylvania Institutional Review Boards (the committees charged with overseeing research on human subjects)
- The University of Pennsylvania Office of Regulatory Affairs
- The University of Pennsylvania Office of Human Research (the office that monitors research studies)
- Authorized members of the University of Pennsylvania, the UPHS and School of Medicine workforce that may need to access your information in the performance of their duties (for example: for research oversight and monitoring, to provide treatment, to manage accounting or billing matters, etc.)
- Research collaborators at the University of New Mexico
- National Institutes of Health
- Philadelphia Department of Public Health Institutional Review Board

The Principal Investigators or research staff will inform participants if there are any changes to the list above during their active participation in the trial.

Authorization for use of personal health information for this specific study does not expire while the study is active (about 5 years). Paper research records are saved in an archive for 10 more years and are then destroyed. Study participant contact information may be held in a research database. However, the School of Medicine may not re-use or re-disclose information collected in this study for a purpose other than this study unless:

- The participant has given written authorization
- The University of Pennsylvania's Institutional Review Board grants permission
- As permitted by law

11 Resources Necessary for Human Research Protection

11.1 Qualifications of Investigators

Robert A. Schnoll, Ph.D. (Principal Investigator): Dr. Schnoll has lead a laboratory devoted to collaborative and independent research on treatments for nicotine dependence. Dr. Schnoll has developed and studied behavioral interventions for nicotine

dependence, conducted numerous clinical trials of medications for nicotine dependence, and specialize in evaluating novel ways to improve treatments for nicotine dependence as well as studying treatments for nicotine dependence among clinical populations, including cancer clients, smokers with HIV/AIDS, pregnant smokers, and smokers with serious mental illness. Dr. Schnoll has conducted several large, multi-site clinical trials and trials that evaluated methods for training clinicians to treat nicotine dependence. Dr. Schnoll has expertise in conducting multi-site smoking cessation clinical trials, understanding clinician behavior with regard to the treatment of nicotine dependence, implementing organizational interventions to promote nicotine dependence among clinicians treating under-served communities, and with delineating clinical treatment guidelines for treating tobacco dependence in clinical populations.

Douglas M. Ziedonis, M.D., M.P.H. (Sub-award Prinicipal Investigator): Dr. Ziedonis has lead and advised on numerous international, national and local initiatives on tobacco addiction and mental illness and has been supported by NIH funding during the past 20 years, including projects to develop, implement, and evaluate treatment and organizational change interventions to enhance clinical treatment of tobacco use disorder. Dr. Ziedonis has successfully helped hundreds of agencies across the nation and internationally with the Addressing Tobacco Through Organizational Change (ATTOC) approach and training on the Evidence Based Tobacco Use Disorder treatments. Dr Ziedonis has extensive NIH and other research grant experience related to the ATTOC approach, including working with similar clinical treatment agencies in providing technical assistance and training, which will inform and support the goals of this study. Dr. Ziedonis has led / co-led numerous efforts to evaluate the impact of this ATTOC model and initiatives to improve treatment for Tobacco Use Disorder (TUD) among those with an SMI for the Robert Wood Johnson Foundation, NIMH, NIDA, MA Department of Mental Health, Veterans Affairs Health Care, the American Psychiatric Association, the Smoking Cessation Leadership Center, and SAMHSA.

11.2 Research Staff

The following research staff will be directly involved with the implementation and execution of the current study:

Name	Study Role
Robert A. Schnoll, Ph.D.	Principal Investigator, University of Pennsylvania
Douglas M. Ziedonis, M.D., M.P.H	Sub-award Principal Investigator, University of New Mexico
Frank T. Leone, M.D.	Co-investigator and Study Physician, University of Pennsylvania
David S. Mandell, Sc.D.	Co-investigator, University of Pennsylvania
Daniel E. Polsky, M.P.P., Ph.D.	Co-investigator, University of Pennsylvania
E. Paul Wileto, Ph.D.	Co-investigator and Statistician, University of Pennsylvania
A. Eden Evins, M.D., M.P.H.	Research Consultant, Harvard University
Mackenzie Quinn, B.A.	Research Study Project Manager, University of Pennsylvania
Anna-Marika Bauer, B.A.	Research Study Project Manager, University of Pennsylvania
Nathaniel Stevens	Research Staff, University of Pennsylvania
Gabrielle Barrila	Research Staff, University of Pennsylvania
ShelDan Dalsimer, B.A	Research Staff, University of Pennsylvania
Michelle An	Research Staff, University of Pennsylvania
Scott Siegel, Ph.D., MHCDS	Research Staff, Christiana Care Health System
Sue Ware, B.S.	Database Manager, University of Pennsylvania
Brian Isakson, Ph.D	Co-investigator, University of New Mexico
Andrew Sussman, Ph.D	Co-investigator, University of New Mexico
Michelle Harkins, M.D.	Co-investigator, University of New Mexico
Amy Bachyrycz, PharmD	Co-investigator, University of New Mexico
Prjakta Adsul, MBBS, Ph.D	Co-investigator, University of New Mexico
Thomas Anthony Chavez, Ph.D.	Co-investigator, University of New Mexico
Orrin B Myers, PhD	Statistician, University of New Mexico
Cesar Javier Ojeda, MBA	Research Staff, University of New Mexico

Other individuals will provide supportive services not directly related to the execution of the study including CMHC recruitment consultations (Cherie Brummans, M.B.A., Rosemary O'Rourke, M.Ed., Michael Brody, M.S.W. and Geoffrey Neimark, M.D., M.S.) and web development (Sharon Kershaw).

12 Study Finances

12.1 Funding Source

This study is financed through a grant from the National Cancer Institute. This study has a sub-contract with University of California – San Diego and University of New Mexico to oversee the implementation of the intervention (Dr. Douglas Ziedonis, PI).

12.2 Conflict of Interest

All University of Pennsylvania Investigators will follow the University of Pennsylvania Policy on Conflicts of Interest Related to Research.

12.3 Subject Compensation

Clinic personnel and client participants will be compensated for participation (see Participant Compensation Schedules below). Compensation will be provided in-clinic or by check.

Clinic Personnel Participant Compensation Schedule*		
Session	**Time Point**	**Time and Effort Reimbursement**
1	Baseline	$20
2	Week 1	-
3	Week 4	-
4	Week 8	-
5	Week 12	$20
6	Week 16	-
7	Week 20	-
8	Week 24	$20
9	Week 28	-
10	Week 32	-
11	Week 36	$20
12	Week 52	$20
Total		**$100**

**Per person*

Clinic Client Participant Compensation Schedule			
Session	**Time Point**	**Time and Effort Reimbursement**	**Travel Reimbursement**
1	Baseline	$20	$10
2	Week 12	$20	$10
3	Week 24	$20	$10
4	Week 36	$20	$10
5	Week 52	$20	$10
Subtotal		$100	$50
Total		**$150**	

13 Publication Plan

We will follow standard methods for publishing the results of this study and in accordance with any publication policies of the University, Department, Division or Research Center.

14 References

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