Protocol and Appendices (Main Outcomes, Power Calculations and SAP)

Protocol for: Changing Pediatric Office Systems Nationally to Address Parental Tobacco Use

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1. INTRODUCTION

1.1. Summary of general background

1. Parental smoking is associated with poor health outcomes for children, spouses, and the smoking parent. 2. Proven tobacco control strategies exist for smokers in this age group. 3. Parental smokers have more frequent contact with the child's clinician than with any other healthcare clinician, including their own. 4. Effective strategies for parental tobacco control are currently not implemented in the pediatric outpatient setting. In this study, we will test a previously developed, pilot tested, and theoretically based parental tobacco control intervention for effectiveness within a large outpatient pediatric research network.

1.2 Significance In this study we will test a previously developed, theoretically based, pilot-tested, and effectively implemented parental tobacco control intervention for overall effectiveness, cost per quit, and factors that affect sustainability of the intervention within the largest association of pediatric care providers. Our detailed process evaluation at the clinician level, the patient behavior level, and practice systems level will add substantially to the compilation of essential elements in the national tobacco control strategy for pediatric healthcare settings. The multilevel approach will inform science and theory in tobacco control and public health by identifying how and for whom the intervention works and by providing an integrated and sustainable systems change template for pediatric practices nationally. The generalizable intervention model, meeting the new quality improvement recertification requirement, can spread rapidly across child health care settings to help families eliminate tobacco use and maximize population impact.

Helping parents quit smoking is a national priority: Quitting smoking adds an average of seven years to a parent's life,[1] eliminates the majority of their children's tobacco smoke exposure (TSE),[2-4] eliminates smoking-related poor pregnancy outcomes for all future pregnancies,[5] addresses the primary cause of house fire mortality,[6,7] decreases the accessibility of cigarettes and odds that teens become smokers,[8-10] and improves the financial resources of disadvantaged families.[11] The child's health clinic provides the best and sometimes only access to the healthcare system for parents who smoke. Parents who smoke are often underserved medically, but see their child's doctor an average of four times each year,[12] significantly more than they themselves see a clinician.[13-16]

The effectiveness of smoking cessation strategies used in this study and in this context is well established. According to the most recent meta-analyses from the Tobacco Dependence Treatment Update in 2008,[17] the effectiveness of physician counseling alone shows an odds ratio (OR) for quitting of 2.2 [1.5-3.2](95%CI) and a quit rate of 19.9% [13.7-26.2], the quitline alone shows an OR of 1.6 [1.4-1.8] and a cessation rate of 12.7% [11.3-14.2], and combination NRT patch and *ad lib* NRT gum medications as proposed in this study shows an OR of 3.6 [2.5-5.2] and a cessation rate of 36.5% [26.6-45.3]. Moreover, the combination of these therapies has been demonstrated more effective than individual components alone. In addition, a meta-analysis recently demonstrated the effectiveness of parental smoking cessation initiated in the pediatric context.[18] However, despite this evidence, effective strategies for parental tobacco control are currently not implemented in the pediatric outpatient setting, and almost nothing is done to help parents quit smoking in this clinical context, despite overwhelming evidence that a child's visit to the doctor provides a teachable moment for parental smoking cessation.[19-21] Our team has shown that parents accept smoking cessation medications and quitline enrollment in this clinical context.[22,23]

Our Phase 1 research study was the first large scale demonstration of effectively implemented tobacco dependence treatment for parents in the pediatric context (see preliminary studies C2). Critical next steps include studying implementation in a nationally generalizable context of pediatric practices, measurement of institutional sustainability,[24] and cost-effectiveness.[25]

Essential national environmental factors external to the practices are now in place to maximize the potential for sustained practice change, i.e. institutional sustainability, with this intervention. These features are: (1) an available smoking cessation quitline in every state;[26] (2) publically covered cessation medication;[27] (3) required continuing medical education (CME) project addressing quality improvement in order to obtain pediatric recertification;[28] (4) development of our on-line intervention training module that meets these recertification requirements;[28] and (5) a social climate where it is acceptable and even expected that parents receive cessation support from any healthcare clinician.[22,23] In studying the sustainability of this intervention, we will be maximizing the long-term deployment of the intervention and contributing to the science of sustainability for other preventive services.[29]

2. STUDY DESIGN AND METHODS

The proposed study is a cluster randomized controlled trial designed to test the effectiveness and sustainability of a previously developed, tested, and theoretically based tobacco control strategy—the Clinical Effort Against Secondhand Smoke Exposure (CEASE) intervention.

Through the American Academy of Pediatrics (AAP), pediatric practices meeting study inclusion criteria will be contacted for assessing eligibility. Practices must be located in a community-based setting with a non-institutionalized population. Participating practices will need to have 1. A minimum of 4 FTE Pediatricians 2. Self-described practice smoking rate of at least 15%. 3. Average patient flow of 50 families per day/2000 families total. 4. Agreement by all clinicians in the practice to introduce a practice-wide module for systemically addressing parental tobacco use (CEASE). 5. Current use of Electronic Health Records system 6. Willingness to set up and use a Disease Registry 7. Willingness to have a Research Assistant in the office setting 6. A working fax machine. 7. Adequate geographical distance from other participating practices to minimize contamination effects. 8. Practices cannot have taken part in Phase 2 focus groups or other pilot tobacco control studies. 9. Practices must not be actively enrolling patients into other AAP trials. Practices will be eligible if they saw a minimum of nine smoking families (proxy for parent smoking rate) and a minimum of 40 families per day (proxy for practice flow rate).

Eligibility criteria for parents/guardians to participate in the study include that they have smoked a single cigarette, even a puff, in the past 7 days or have quit smoking in the past 2 years; are accompanying a child being seen at the participating practice; have adequate English to respond to written surveys; and be at least 18 years of age. We will enroll a total of approximately 200 parents in each practice from 10 practices (5 intervention, 5 control) at both the baseline and 24 month time points for a cumulative total of 4000 enrolled parents. We expect that practices will be differentially productive for parent enrollment, and will replace practices that do not enroll 200 parents with practices from the replacement group in the same state stratified and randomized according to practice size and parental smoking rate.

At the end of parent/guardian data collection in intervention practices, the practice leader and a key office staff member (office manager, administrator, secretary) will be qualitatively interviewed by telephone to gather data on the implementation process. This interview will take approximately 60 minutes. It will be recorded and transcribed.

3. SPECIFIC AIMS AND HYPOTHESIS

Aim 1. To implement and sustain adherence to tobacco-control guidelines at the clinical level;

H1. Rates of the following clinical actions, assessed by exit survey at baseline (post-implementation) and 2 years will be sustained at a greater level in the intervention practices than in controls at 2 years;

- Delivery of cessation assistance, defined as prescribing medication, or enrolling in the quitline or other program (Primary outcome for Aim 1);
- Clinician asking and advising about parental smoking and smoke-free homes and cars.

Aim 2. To facilitate behavior change among parents and evaluate cost per quit among parents who smoke;

H2. Rates of the following parent behaviors, as assessed by the Exit Survey at baseline and 2 years, will be greater in intervention practices than in usual care control practices:

- Change in practice prevalence of parents who smoke assessed at baseline and at 2 years;
- Change in quit rate at the practice: quit in the last 2 years, cotinine-confirmed at baseline and at 2 years;
- Reduced parental smoking inside homes and cars assessed by previously validated, self-reported strictly enforced rules prohibiting smoking in the home and car;
- Use of services from any smoking cessation program (e.g. quitline)
- Use of pharmacotherapy (any source)

Aim 3. To study systems changes and the processes that affect them at the practice level.

H3. Leadership support, EHR integration, program institutionalization, and environmental factors (quitline accessibility, billing for services) will correlate with delivery of cessation assistance, as assessed by post-implementation qualitative interviews with practice leaders and key office staff. These interviews will be guided by an interview guide, which has been tailored from the Consolidated Framework for Implementation Research (CFIR).

4. STUDY ENDPOINTS

Intervention and control groups will be compared on the following:

Practice based:

1. Clinician asking parents about their smoking, as well as clinician delivery of tobacco control advice and services for cessation (primary outcome);
2. Clinician counseling for institution of strict rules against smoking in the home and car;

Parent behavior based:

3. Change in prevalence of parents who smoke by condition from baseline to 2 years (self-reported at baseline and 2 years);
4. Change in parental 7-day abstinence, cotinine-confirmed from baseline to 2 years;
5. Parental quit attempts lasting at least 24 hours;
6. Parental use of pharmacotherapy for smoking cessation;
7. Parental use of services from any smoking cessation program (e.g. quitline);
8. Reduced parental smoking inside homes and cars.

5. KEY PROCEDURES OF THE STUDY

5.1 Overall procedures

a. Practices will be contacted through clinician membership in the AAP using its routine field-tested methodology and techniques.

b. For practices that say yes to recruitment, meet initial inclusion criteria, and return the Participation Form indicating agreement to confirm their practice smoking rate (approximately 30), AAP staff will send copies of the Practice Population Survey (PPS) to practice staff and train staff in its administration. It will be administered to consecutive patient families over 3 days. The PPS will assess health behaviors, including tobacco use, of parents, so that smoking rates of parents can be used as an inclusion criterion. Completed surveys will be mailed to MGH within 1 week of completion, where they will be tabulated by MGH staff to determine parent smoking and flow rates. Practices will be eligible if they saw a minimum of nine smoking families (proxy for parent smoking rate) and a minimum of 40 families per day (proxy for practice flow rate).

c. Based on the results of the PPS, a total of 18 practices will be recruited from 6 different states and asked to consent to participate in the study. Practices will be assigned to one of three groups: 1. The CEASE intervention (5 practices) 2. Usual care control (5 practices), or 3. Replacement (8 practices). In 5 different states, a pair (2) of practices that meet inclusion criteria for parent enrollment are matched on parent smoking rate and practice size. Each pair (10 practices total) will then be randomized to receive either 1. The CEASE intervention or 2. Usual care control. The remaining practices (those that were not matched for randomization) will be assigned to the replacement group. This includes 1 practice per active state and 3 practices in an additional, non-active state. Practices that fail to meet parent enrollment goals will be replaced with a replacement practice that also met the study inclusion criteria (i.e. baseline smoking rate and having at least 4 FTE pediatricians).

d. The practice leader is self-identified on the Participation Form the practice returns in response to the letter of invitation from to the APP to administer the Practice Population Survey (PPS) to confirm that the practice has a parent smoking rate $\geq$15%. Based on the results of the PPS, all clinicians (defined in the context of this study as anyone who sees their own patient panel such as a MD, Nurse Practitioner, or Physician's Assistant) and practice staff (including RNs and those interacting with patients) at participating practices will be required to agree to have the intervention take place in the practice. The completed Participation Form from the practice leader will attest to the agreement of all clinicians at the practice to hold the intervention in the office and will contain a list of those clinicians that wish to participate in the intervention and receive MOC through the online module.

e. In the intervention group, practice leaders will complete regular practice feedback before training in the intervention (baseline) and at regular intervals after enrollment has begun through the online module.

f. Control and intervention practices will be trained in integrating a Research Assistant (RA) who will be hired, trained, and paid by the research study for data collection. Research Assistants will be recruited in the practice sites' local areas through networking, temporary office-service contractors, and other local resources.
g. A notice to parents will be posted where all can see it when registering for their pediatric visit. The notice announces that the practice is participating in a research study and that parents/guardians may be approached by a study RA on their way out of the office. Practice staff will follow a script at the check-out desk to refer parents to the RA for the Eligibility Screener.
h. Clinician training will be carried out through an online module through the American Academy of Pediatrics' EQIPP system. The time of training will depend on the practice's assignment to either the control, intervention, or replacement arm. Access to the online module will be provided to the control and replacement groups at the conclusion of the research study. Specific features of the CEASE intervention that will be migrated to the EQIPP module include: materials that prompt delivery of the brief 3-step process (Ask, Assist, Refer), systematic and proactive enrollment of parental smokers in telephone counseling at the quitline that will follow-up on clinician's advice to quit; explicit counseling of parents on the importance of strictly enforced smoking prohibitions within the home and car; and prescription of nicotine replacement therapy (NRT) for parental smokers in the context of the child's healthcare visit. The CEASE intervention follows the Public Health Service Guidelines by incorporating these evidence-based tobacco control treatments and practices. Intervention practices will be trained over an 8-week period of time in implementation of the CEASE intervention; control practices will continue their routine care until 24 months after they have completed enrollment of parents for the study. Then, they will receive access to the online CEASE module. In order to ensure security of any information collected through the online course, clinicians will be given an informational sheet on how to manage their account settings (profiles, privacy) and how to deactivate their accounts if they so choose. They will also be given the option to complete training through a de-indentified account. Additional tobacco control training will be offered to intervention practices, as a supplement to the CEASE training described above. Up to two individuals per practice identified by the practice leader will be given the opportunity to take the "Basic Skills for Working With Smokers" online course from University of Massachusetts Medical School Center for Tobacco Treatment Research and Training free of charge and paid for by the study. CEUs are available for RNs (14.4), Certified Health Education Specialists (12), Social Workers (12), Respiratory Therapists (12), Registered Dental Hygienists (12), Certified Substance Abuse Counselors (CADAC/CAC/LADC) (11) and a general certificate of completion (12) for all other participants.

During their pediatric office visit, parents will receive one of two conditions:
1. **usual care control**, consisting of whatever the specific clinicians usually do for parental tobacco control; or
2. **the CEASE intervention.**

5.2. The CEASE Intervention consists of a brief motivational message (based on information supplied by the parent in the CEASE Action Sheet) about tobacco use and SHS exposure delivered by the healthcare clinician, offer of enrollment in a free telephone quitline and a free text message cessation service, and receipt of a prescription for *covered* NRT for cessation.

When parents arrive at the office for their child's visit, they will check in at the front desk. While they check in, they will be presented with an iPad and asked to consent to a brief Intake Survey.

(The consent process is described in this application.) The data that parents enter into the Intake Survey (attached separately) is as follows: the first and last name of the youngest child being seen in the office that day, the name of the clinician being seen, and which member of the household uses tobacco (mother, father, patient, or other). Practices will be offered the option of having the Intake Survey appear on the iPad in both English and Spanish. If the practice would like the Intake Survey to appear in both English and Spanish, the Spanish translation of the Intake Survey will be generated by a certified translation specialist. The Intake Survey will also contain links to embedded educational YouTube videos on tobacco cessation-related topics that can be viewed by parents who choose to view them; the videos will be offered with closed captioning for easier comprehension in waiting rooms. To help the CEASE research team evaluate which videos are most liked by parents who visit the practices, parents will be asked to provide a rating of the video on the iPad Intake Survey between 1 star (not good) and 4 stars (great). After the parent completes all questions, the office staff are asked to hand them a CEASE Action Sheet (part of the clinical intervention) and document the distribution of the CEASE Action Sheet on the Intake Survey. If the parent indicates he or she would like to be connected with the free state tobacco quitline on the Intake Survey, the office staff are prompted to hand the parent a tobacco quitline referral sheet and document the distribution of the tobacco quitline sheet on the Intake Survey. When available from the state's tobacco quitline, the iPad will include helpful information for parents who receive a tobacco quitline enrollment form about when to expect a call from the quitline and how the call will likely appear on their caller ID. Data from the Intake Survey will be electronically housed in a REDCap database accessible only by study staff at MGH. Each month, MGH staff will place this data into a practice-specific Intake Survey Report, organized by clinician name. This report will be sent no more than once a month via a password protected file from MGH study staff to a contact staff person within the practice who will be chosen by the practice leader. The contact person will be responsible for receiving the report and distributing it to each of the clinicians in the practice.

The monthly Intake Survey Report functions as a supplement to the CEASE tobacco intervention performed by the clinician during the child's visit. Clinicians are provided with a list of the children in their care who live with a tobacco user. This list is a convenient resource for clinicians who may want to provide adjunct resources to tobacco users: instead of searching through individual medical records, the Intake Survey Report streamlines the process by listing all families who have consented to receive specialized tobacco services and resources. Practices will be free to use this list in the way that makes most sense for their office: there will not be a specific research protocol to follow. Rather, the list is intended as a flexible adjunct to the intervention. However, in order to help increase the utility of the Intake Survey Report, practices will be provided with suggested clinical interventions to perform with the families on the report. For example, one clinical intervention that will be suggested to practices is using the list to send parents letters that offer additional support and services for quitting tobacco.

In order to assess the utility of the Intake Survey Report, the practice leader will participate in a monthly 5-minute follow-up with a member of the study team. During these follow-ups, the practice leader will be asked a series of follow-up questions about their practice's use of the Intake Survey Report, (attached separately). Data from these follow-up discussions will be logged in a secure database at the MGH and AAP sites.

5.3.Research aspect

After being seen by the pediatric clinician, the parent will be approached by the RA stationed near the exit of the practice for an exit interview consisting of the Eligibility Screener, and for

eligible parents, the Exit Survey. During the Eligibility Screener, parents will be asked for demographic information and screened for smoking status. If they say yes to either of the questions, "Have you smoked a cigarette in the past 7 days, even a puff?" or "Have you smoked a cigarette, even a puff, in the last 2 years?" and meet other eligibility requirements, they will qualify for study enrollment. Parents who agree to study participation will learn about the study, sign the consent, and complete the Exit Survey for enrolled parents/guardians.

Biochemical validation of self-reported abstinence within the past 2 years will be obtained with parent consent by the RA at the completion of the Exit Survey at both time points (baseline and at 2 years) using saliva swabs that will be tested for the nicotine metabolite, cotinine.

At the end of data collection, a key office staff member and the practice leader will be asked to individually participate in a qualitative interview. The qualitative interview will be conducted by phone by the CEASE implementation specialist. Before the qualitative interview begins, the respondents will be asked to review the CEASE Interview Information Sheet. The interview will begin with reviewing the CEASE Interview Information Sheet, including an explanation of the interview, highlighting the right of the respondent to stop the interview at any time or to skip any question. The respondents will also be informed of how their data will be used and the anonymization procedure. The respondent will be asked for permission to record the interview; this permission will be recorded. If no permission is given, the recording will stop immediately. The qualitative interview will be guided by the interview guide and will focus on the process of implementing CEASE in their practice.

6. RECRUITMENT PROCEDURES

6.1 Subject Recruitment: Parents will be recruited to complete two surveys during their visit to the practice. They will be asked to complete the 1) Intake Survey and 2) the Eligibility Screener and Exit Survey. These surveys will take place at two different times during the family's visit to the doctor's office.

Recruitment to complete the Intake Survey and receive additional tobacco cessation services: (This protocol will occur at intervention practices ONLY.) When a parent checks in for their child's visit, the front desk staff will ask parents to complete a brief intake survey on an iPad. This iPad will be provided to the practice by the study team for the duration of the study. When a parent checks in at the front desk upon arrival for their child's visit, they will be handed the iPad and asked to answer a brief screener question that appears on the screen: "Does any member of your household use tobacco?". Parents who select "Yes" will be asked to provide informed consent prior to completing the remainder of the questions on the survey. The consent language (attached separately) will inform parents that they will be asked to complete four questions, and that the information provided will be shared with their child's doctor so that s/he may provide specialized tobacco services and resources. We are requesting a waiver for the requirement for written documentation of informed consent for this survey. Parents will be asked to review the consent language on the iPad and indicate their consent to complete the remaining questions on the Intake Survey by selecting *Yes* or *No* on the iPad. After parents have indicated their informed consent, they will complete the remainder of the Intake Survey questions (attached separately). Parents who do not provide consent will be prompted to give the iPad back to the front desk

staff. These parents will be eligible to consent to complete the Intake Survey at future visits during the 24 month study period if they so choose.

Recruitment to complete the Eligibility Screener and Exit Survey: A notice will be posted at the patient registration window of all participating practices, informing all parents accompanying their children to office visits that the practice is participating in the research study. After being seen by the pediatric clinician and upon checking out, the parent will be directed to the RA stationed near the exit of the practice. The parent will be approached by the RA for an Eligibility Screener interview. The RA will ask all parents basic demographic questions and if they have "smoked a single cigarette, even a puff, in the past 7 days." The RA will invite enrollment and obtain consent from those who screen positive for current smoking or are former smokers who quit in the last 2 years and meet other eligibility criteria (see above, Research Design and Objectives). The RA will administer a survey of additional demographic characteristics, tobacco-related services received at the visit, and tobacco behaviors as an Exit Interview for all enrollees. The RA will maximize confidentiality and privacy by administering the survey in the most private location possible, out of low-voice ear-shot of others. The survey instrument will be held in such a way that the parent can read it silently and silently indicate answers. Eligible parents will be offered an incentive worth $5 for enrolling in the study. Enrolled participants who also provide a saliva sample will be offered an incentive worth $20. Women will be well represented in the recruitment pool, as they comprise about 75% of the parents taking children to the pediatrician. To enhance recruitment of minorities and under-served populations, some recruitment materials state: "We strongly encourage practitioners who serve low income and minority populations to participate."

6.2 Practice Recruitment: To recruit pediatric practices, the AAP will use the same recruitment methodology they have used in their other studies. The AAP will recruit practices from a nationwide membership pool of 60,000 board certified pediatricians by utilizing standardized recruitment techniques that have yielded recruitment rates in excess of 25% in other AAP studies. These methods include e-mail contact, flyers, and articles in appropriate publications with subsequent phone and e-mail contact with interested parties. Recruitment materials (attached separately) will include a recruitment fax, tri-fold pamphlet, recruitment flyer, recruitment cold e-mail, one-page information sheet, and a formal letter of invitation to conduct the Practice Population Survey (PPS). Recruitment materials and information will also be available on a CEASE recruitment webpage that will be housed within the AAP Richmond Center website. This webpage will contain the information included on the 1-page Recruitment Information sheet included in this application, as well as have an embedded "prezi"-- a brief video presentation that also contains basic information about the study. The prezi is a media-based recruitment strategy that will allow a controlled message surrounding the study to be narrated using language adapted from other recruitment materials. It is designed to be used on the CEASE website to provide an introduction to interested clinicians. The webpage will also contain the contact information for AAP staff who will be doing the recruitment. Initial inclusion criteria will be described in recruitment materials and will include:

1. Presence of at least 4 FTE pediatricians
2. Self-described practice smoking rate of at least 15%
3. Average patient flow of 50 families per day/2000 families in the practice
4. Agreement by all clinicians (defined in the context of this study as anyone who sees their own patient panel such as a MD, Nurse Practitioner, or Physician's Assistant) in the practice to introduce a practice-wide module for systemically addressing parental tobacco use (CEASE)

5. Current use of EHR
6. Willingness to set up and use a disease registry
7. Willingness to have a Research Assistant in the office setting
8. A working fax machine
9. Adequate geographical distance from other participating practices to minimize contamination effects
10. Practices cannot have taken part in Phase 2 focus groups or other pilot tobacco control studies
11. Practices must not be actively enrolling patients into other AAP trials.

It is estimated that approximately 30 practices will meet these criteria.

Practices that meet initial inclusion criteria will be asked to administer a brief, anonymous Practice Population Survey (PPS) to all patient families seen during three consecutive days. Eligibility criteria for study enrollment include 1. Successful administration of the PPS and receipt of completed survey forms by study staff within 1 month of practice being recruited. 2. Agreement by all practice clinicians to host the study within the practice by signing the study consent form. 3. A combined smoking rate of at least 15% and practice size that will yield an average of at least 7.5 smokers per day. Randomization of two practices to the intervention or usual care control group will take place once three practices have been identified in 5 pre-determined states. Practices will be matched on practice size and parent smoking rate. One practice will be assigned to the replacement group after the two matched practices are randomly assigned to either the control or intervention. An additional state with 3 practices will be assigned to the replacement group.

In order to determine that a practice is ready to host an RA for baseline data collection, the practice will need to meet the following two benchmarks, which will be shown using the Medical Records Review Sheet (attached separately). The benchmark review time will be scheduled with the practice leader by MGH staff:

1) At least 90% of patients with identified tobacco use in the household will have been given the CEASE Action Sheet, as determined by data from the Intake Survey. If a practice does not meet the 90% criteria, they will be given appropriate feedback and the benchmark review will be rescheduled.
2) At least 60% of patients identified on the Intake Survey as having tobacco use in the household will have documentation of household tobacco use/exposure in the medical record. This data will be determined through the completion of the Medical Records Review Sheet (attached separately). This document, filled out by the practice leader, will ask them to select 10 names from their Disease Registry. The practice leader will review the medical record of each person he/she selects and indicate whether documentation of tobacco use or exposure in the household is present. If the practice does not meet the 60% criteria, they will be given appropriate feedback and the benchmark review will be rescheduled.

After randomization, practices in the intervention and usual care control arms will be asked to determine an enrollment start date. Study staff will use practice preferences to schedule subsequent study activities (practice training tasks, recruitment and training of Research Assistants for exit interviewing and enrolling parents). Practices that fail to meet parent enrollment goals in a timely fashion will be replaced by a practice in the replacement group that also met the study inclusion criteria.

7. ADHERENCE TO ETHICAL GUIDELINES

7.1 Consent procedures

7.1.1 Parents:

There are two different types of consent for the parents, as follows:
In both intervention and control arm practices, parents will be consented for participation in the Exit Survey by the RA.

After completing the Eligibility Screener with parents, the RA will invite study enrollment of eligible parents according to a script located on the survey. The consent-request script is: "Would you be willing to be surveyed for a research study about families and smoking? Your participation is voluntary and will not affect your child's care at this practice. If you agree to join the study, we would ask 20 short survey questions. The Exit Survey will take approximately 5 minutes. You will receive a gift valued at $5 for completing these questions."

If the parent says, "No," the RA says, "OK. Thank you." If the parent says "Yes," the RA explains the study and shows the parent the consent form. The demographic responses will be used to track and report selection bias.

Before the parent or RA signs the consent form, the RA reads aloud the validation paragraph contained in it. This paragraph summarizes what the study entails for the parent: 1 survey; payment of cash or gifts valued at $5 for completing the survey; a saliva sample and an additional $20 incentive for people who qualify; and completely voluntary participation. If the parent agrees, he/she and the RA both sign 2 copies of the consent form. The parent keeps one, and the RA keeps the other to file. Parents will be protected from practice coercion for enrollment by the separation of the enrollment process implicit in the use of the Exit Survey, whose enrollment information is confidential and only know to the study staff at MGH and AAP.

In the intervention arm practices only, parents will consent on the iPad for their participation in the REDCap web-based Intake Survey. **We are requesting a waiver of the requirement for written documentation of informed consent for completion of the Intake Survey.** The intake survey presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context. The waiver of written documentation of informed consent will not adversely affect the rights and welfare of the subjects. The research could not practicably be carried out without the waiver. The consent procedure is such that subjects are provided with a written statement about the survey and the use of their data followed by a Yes/No button to click to indicate if they agree or decline participation to complete the remainder of the survey and allow their responses to be shared with their child's doctor to provide their family with free resources and specialized services. The consent procedure we will use will have the consent language embedded into the intake survey to ensure that every parent who picks up the iPad and completes the online survey has received the opportunity to provide informed consent. Without the waiver of the requirement for written informed consent, the research team cannot be assured with certainty that the busy front desk staff would obtain written informed consent from every parent prior to completing the online survey. By embedding the consent language into the online survey itself, we are eliminating the possibility that a parent completes the online survey without giving informed consent. The administration of the online intake survey could not be practicably carried out without the waiver

in the pediatric office setting. Parent consent for the Intake Survey will be obtained on the iPad, as described above. We have applied for a waiver of the requirement for written documentation of informed consent for this portion of the study. Front desk staff will be trained to use an information sheet (attached separately to refer to in the event that parents have questions or concerns regarding the Intake Survey on the iPad. Front desk staff will be trained to refer to this sheet and will not provide specific informed consent related answers other than those listed here

7.1.2 Pediatric Clinicians

Pediatric practices that have responded yes to participation and meet initial inclusion criteria will receive an invitation from the AAP to administer the Practice Population Survey (PPS) to confirm that the practice has a parent smoking rate ≥15%. The Practice Leader will identify him/herself on the Participation Form and fax back a response to the AAP. Practices will agree to distribute the Practice Population Survey (PPS) by responding "Yes" on the Participation Form they return to AAP in order to participate in this initial phase. Based on the results of the PPS, practices will then consent to participate in the study by signing the Clinician Consent Form. The Practice Leader will be the AAP contact practitioner and will describe the study to practice colleagues. The Clinician Consent Form describes study procedures, including agreement to randomization to either CEASE intervention, usual care control, or replacement status, acceptance of training (as appropriate based on condition), and acceptance to host the RA conducting exit interviews and consenting parents to the study.

In intervention practices, practice leaders and key office staff members will be asked to review the CEASE Interview Information Sheet prior to the qualitative interview. The CEASE Interview Information Sheet describes the purpose of the qualitative interview, as well as the respondent's right to skip questions and the right to stop the interview at any time.

7.2 Foreseeable risks and discomforts

Risks to participating parents will be minimal. They include the potential discomfort of revealing personal tobacco use to pediatric office staff and the study RA. To minimize this discomfort and maximize privacy during the practice recruitment phase of the study, parents will be given the Practice Population Survey (PPS) to complete in writing. The form will have a wafer seal so that contents of completed surveys can be confidential when presented to the reception staff. (See recruitment procedures for additional details about administration of the PPS.) To reduce loss of time that could otherwise be spent on other productive activities, participants will be asked to spend approximately two minutes of time completing the PPS while waiting for their pediatric clinician.

Parents may also be uncomfortable discussing tobacco use with the pediatric clinician during the office visit. To maximize privacy and confidentiality, the protocol calls for such discussions to occur in the examining room, and for all records related to the parent's smoking to be kept with the child's personal medical records.

To maximize privacy for the exit interviews, RAs will speak to parents in the most private space available and in voices as quiet as possible. The RA will hold exit interview materials in such a way that the parent can read the questions silently and silently indicate which answers are appropriate. The Parent Consent Form includes a validation paragraph that specifies the major costs and benefits to the parent of study participation to help ensure understanding and follow-through.

Enrolled parents reporting abstinence at the baseline and 2 year data collection time points will be asked to give saliva samples for testing to verify cessation. Parents will be assured that they can refuse to answer questions they do not want to answer, and that they can withdraw from the study at any time. Samples are obtained in a discreet manner and in the most private location possible within the office setting. The parent's unique, non-identifiable number is used to label the saliva sample. Any identifiable parent information is not recorded on the saliva sample to protect their confidentiality.

Pediatric clinicians may experience some risk of alienating patients' parents who are uncomfortable discussing tobacco use and secondhand smoke (SHS) exposure of family members. Professional judgment is the only satisfactory arbiter in such cases. Parents may also be uncomfortable receiving follow-up tobacco cessation services based on their responses to the Intake Survey. This risk will be minimized by clearly explaining in the intake survey consent language (attached separately) that they may receive specialized follow-up services if they agree to provide their information.

A household member may be identified on the Intake Survey as a tobacco user by another household member without their knowledge. The research team will not share this confidential information with any other parties except their child's pediatric practice as explained in informed consent section of the REDCap intake survey.

Qualitative interview respondents (practice leader and key office staff in intervention practices) may experience slight discomfort during the qualitative interview (for intervention practices). Discomfort may result from being asked to provide feedback on the process of implementing CEASE in their practice. This risk will be minimized by clearly explaining at the start of the interview, as well as on the CEASE Interview Information Sheet, that all responses are anonymous and that the data will help improve the CEASE process. Respondents will be assured that they can refuse to answer questions they do not want to answer, that they can stop the interview at any time, and that they can withdraw from the study at any time.

7.3 Expected benefits

Carrying out this research in the pediatric outpatient setting will likely increase the provision of tobacco control services for parents who smoke. Increased provision of services has been proven to increase the chances of quitting smoking. Parents who successfully quit or reduce their tobacco consumption may live longer with a better quality of life, reduce the proven harms caused by tobacco exposure to their spouses and children, and have increased financial resources. Mothers who quit successfully may therefore be non-smokers for subsequent pregnancies, leading to better outcomes for their unborn children. Children of parents who quit have been shown to smoke at lower rates than those whose parents continue smoking. Counseling smokers about reducing others' SHS exposure may decrease morbidity and mortality associated with exposure not only for family members, but also people anywhere that might have been exposed inadvertently as a result of the smoker's lower pre-counseling awareness of SHS harms.

In addition to benefits accruing to parents from increased service provision are benefits from participating in tobacco control studies. The background smoking cessation rate is estimated at 2%-3%, but smokers who participate in and complete the placebo arms of tobacco control studies often achieve cessation rates that are double or triple this figure.

Pediatric clinicians who participate in the study will expand their skills in tobacco control counseling. They will also acquire tools to implement state-of-the-art tobacco control practices for their patients and families.

7.4 Equitable selection of subjects

The sample will be drawn from families attending practices distributed throughout the country affiliated with the American Academic of Pediatrics (AAP). The AAP has 59 chapters in the United States, each with a strong network of pediatric offices and clinicians interested in research. By working with a widely diverse set of practice communities, we have tried to maximize the equitable selection of subjects who are parents and who are pediatric clinicians. A comparison of AAP study visits with national data reveals striking similarities on patient gender, Hispanic ethnicity, Medicaid status, nature of visit (sick vs. well), presenting complaints, and physician diagnoses.

8. DATA AND SAFETY MONITORING

This is a minimal-risk study. Parents could be upset about discussing their tobacco use with the pediatric staff or the research staff and could be inconvenienced by the time taken to participate in the study. In pilot studies, this has not been a significant problem. Therefore, a Data Safety and Monitoring Board need not be convened.

8.1. Safety monitoring

Assessment. Participants will be assessed for adverse events at the time of enrollment, when the baseline survey data are received and reviewed, and at 2 years. The Principal Investigator, study coordinators and all members of the research staff are responsible for the assessment and reporting of adverse events. All spontaneous reports by subjects, observations by clinical research staff, and reports to research staff by family or healthcare providers will be investigated by the Steering Committee. The investigators will assess the relationship of the adverse event as not related, possibly related or definitely related using standard criteria for clinical trials.

Possible (to qualify, the adverse event must meet 2 of the following conditions):

1. has a reasonable temporal relationship to the intervention,
2. could not readily have been produced by the subject's clinical state,
3. could not readily have been due to environmental or other interventions,
4. follows a known pattern of response to intervention, and/or
5. disappears or decreases with reduction in cessation of intervention.

Probable (to qualify, the adverse event must meet 3 of the following conditions):

1. has a reasonable temporal relationship to the intervention,
2. could not readily have been produced by the subject's clinical state,
3. could not readily have been due to environmental or other interventions,
4. follows a known pattern of response to intervention, and/or
5. disappears or decreases with reduction in cessation of intervention.

Definite (to qualify, the adverse event must meet at least 4 of the following conditions):

1. has a reasonable temporal relationship to the intervention,
2. could not readily have been produced by the subject's clinical state,
3. could not readily have been due to environmental or other interventions,
4. follows a known pattern of response to intervention, and/or
5. disappears or decreases with reduction in cessation of intervention.

Adverse Event Definitions:
Adverse Event: an undesirable and unintended result of therapy, intervention or interaction experienced by a subject participating in a research study.
Unexpected Adverse Event: any adverse event, the specificity, severity, frequency or nature of which is not consistent with the current general investigational protocol or investigational protocol amendments.
Serious Adverse Event: any adverse event that results in any of the following outcomes: death, a life-threatening adverse event, inpatient hospitalization or prolongation of existing hospitalization, a persistent or significant disability/incapacity, or a congenital anomaly/birth defect. Important medical events that may not result in death, may not be life threatening or may not require hospitalization could be considered serious adverse events when, based upon appropriate medical judgment, they may jeopardize the patient or subject and may require medical or surgical intervention to prevent one of the outcomes listed in this definition. Due to the minimal risk nature of this intervention, in which we collect data only through surveys and administer no medications, we do not expect serious adverse events, such as death.
Potential adverse events that could result from the study include a participant feeling uncomfortable answering interview questions and choosing to discontinue participation. This is clearly stated in the informed consent and assent.
Adverse Event Reporting: An *FDA Medwatch Form* will be used to report all Adverse Events. A copy of the adverse event report will be retained with the subject's research records.
Serious Adverse Events must be reported in writing within 7 calendar days of any member of the investigative team becoming aware of such an event. These adverse events would be reported to the IRB, the American Academy of Pediatrics IRB, and NCI.
Unexpected Adverse Events must be reported in writing within 15 calendar days of any member of the investigative team becoming aware of such an event.
Management of Reported Adverse Events: The PI and the study team are responsible for the appropriate clinical management of all adverse events. The PI will ensure that all appropriate resources are directed toward subject safety and well-being. Any subject may unenroll or discontinue the study at any time at their own discretion or if in the opinion of any study staff, their safety or well-being is jeopardized by continued participation in the study.

8.2 Monitoring and quality assurance

All study data will be aggregated and prepared for analysis at the Massachusetts General Hospital Data Coordinating Center (MGH DCC) by the Data Manager (DM) and Research Assistant (RA). The DM will utilize the REDCap database to house all data collected. Any additional database used to conduct analysis will reside on a password-protected network drive at MGH accessible only to study staff. The DM will meet weekly with the Project Director to review data accrual and quality issues.

8.3 Privacy and confidentiality

Codes will be substituted for names on all materials prior to entering them into the analytic database. The parent consent form will include authorization for MGH to connect names with coded identifiers for data quality assurance of Exit Survey data. The unique enrollment code number of the Exit Survey associated with individual consents will be entered on the consent form by the RA.

Practice Clinician Consent forms will be stored in locked cabinets on a secure floor at the AAP central office. Practices will store their copies of consent forms in a secure location. All study forms will be kept for 10 years, and then destroyed. Practice clinicians will use their assigned

AAP ID number, rather than their names, to identify surveys. This will protect their confidentiality.

8.4 Specimens

8.4.1 Sending specimens/data to research collaborators outside partners

The participant's code number will be used to identify saliva samples sent to the laboratory for the cotinine analysis. No identifying information will be given to the testing laboratory. Data will not be stored at collaborating sites outside of Partners for future use not described in the protocol. Subjects will not be able to withdraw their data.

8.4.2 Receiving specimens/data from research collaborators outside partners

Data collected by the Research Assistants in the Exit Survey will be identifiable when it is received at MGH. This is necessary so that data quality can be monitored and potentially matched by parent with data collected at 24 months. The consent form will inform parents of this fact, and also of the de-identifying procedure that will occur when the data are entered into the analytic database. Data collected from pediatric clinicians collected by the AAP will not contain personal identifiers that could be used by MGH investigators to link to individual subjects.

The AAP study staff will have access to Intake Survey Report Follow-up Data. This data will be identified by the practice's Study ID number (not by clinician name) and will be housed in a secure database accessible only to study staff.

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APPENDIX 1: MAIN OUTCOMES MEASUREMENT

Outcomes	Operational Definition and Assessment Method	*Timing*
H1. Clinician Behavior Delivering cessation assistance (Primary Outcome for Aim #1)	**Assessed by Exit Survey of parents*** Percentage of parental smokers who received any of the following 1. Prescription of pharmacotherapy Or 2. Referral to quitline, local program, or website.	Baseline and 2 years
Screening for parental smoking	Percentage of all parents seen in practice who are screened for smoking status	Baseline and 2 years
Advising parents to quit	Percentage of parental smokers advised to quit smoking during	Baseline and 2 years
Counseling parents about rules	Percentage of parental smokers counseled about home and car smoking prohibition	Baseline and 2 years
H2. Patient Behavior and Return on Investment	**Assessed by Exit Survey of parents***	
Currently smoking parents	Change in prevalence of parental smokers who report smoking currently from baseline to 2 years	Baseline, 2 years
7-day abstinence	Change in percentage of parental smokers who have 7-day abstinence from baseline to 2 years (biochemically verified at Baseline and 2 years)	Baseline, 2 years
Quit attempts	Percentage of parental smokers who report at least one 24-hour quit attempt in past 3 months	Baseline, 2 years
Use of pharmacotherapy	Percentage of parental smokers who report use of medication to help them quit smoking in past 2 years	Baseline, 2 years
Receipt of tobacco control services from the program	Percentage of parental smokers who received telephone counseling or other services	Baseline, 2 years
Institution of smoking bans	Percentage of parental smokers who report strict rules prohibiting smoking anywhere inside their home and car	Baseline, 2 years
H3. Practice Implementation, Maintenance and Sustainability Practice integration of tobacco control office system	**Assessed by regular practice feedback and communication with Practice Leader** Regular feedback will be gathered from clinicians in the form of the online module and phone contact as a back-up method as a back-up method. Qualitative interviews with practice leader and key office staff.	Pre-intervention (baseline) and regularly throughout intervention.

*parents or legal guardians

APPENDIX 2: POWER CALCULATIONS.

Our sample size calculations assume *alpha*=.05, 1-*beta* (power) =.80, two-tailed test of significance, and 10 practices completing the study. Recruiting 15 practices (3 practices in each of 5 states) to get 10 that complete the study is easily attainable given the over 5,000 practices in the AAP network and the proven ability of past study recruitment efforts. A clinically important and conservative estimate of validated 24-month quit rates given the results of prior studies[1-7] is 7.5% in the control group and 12.5% in the intervention group, which requires a total sample size of 1190. With the assumptions of an intra-class correlation of .017 (based on the mean value from a previous study[8]) and a total of 60 providers, we estimated we need a total of 1844 participants to take into account of the clustering effect. We plan to enroll approximately 200 participants from each practice to achieve adequate power.

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APPENDIX 3: STATISTICAL ANALYSES

H1. Rates of cessation assistance delivery, assessed by the Exit Survey at baseline (post-implementation) and 2 years will be greater level in the intervention practices than in controls. The primary outcome is delivery of cessation assistance (see Appendix 1 above for construct) in intervention practices vs. control. We will calculate the mean decrement or increase in cessation assistance from baseline to 24 months in the intervention condition as the primary measure of sustainability. We will build a logistic regression model that includes group, time (baseline and 24 months) and group by time interaction to compare the change in clinician behavior for the intervention and control practices. In addition, these models will include potential confounding factors that are imbalanced between intervention and control groups. To account for the clustering by physician and practice, we will employ the Generalized Estimating Equations (GEE) approach or the generalized mixed effects model approach with the logistic regression models. Rates of clinician asking about smoke-free homes and cars will follow a similar analysis strategy.

H2. Rates of change in parent behaviors as assessed by exit survey at baseline (post-implementation) and 2 years will be greater in intervention practices than in usual care control practices:

The change in practice-level current smoking rate from baseline to 2-years will be compared in the control practices and intervention practices at 24-month follow-up time period. Rates of change in 7-day cotinine confirmed quit rate will also be compared in the control practices and intervention practices from baseline to 24-month follow-up time period. Only self-reported non-smokers who have cotinine values $\leq$10 ng/ml, a consensus cutoff level and who report using NRT in the past 7 days will be considered quit.[1,2] We will use multiple imputation techniques to impute missing outcomes as a sensitivity analysis. We will follow a similar analysis strategy to that stated above in Aim #1.

In addition, we will calculate a primary cost-per-quit endpoint from the societal perspective using well-accepted, state-of-the-science cost-effectiveness methods previously used by our team.[4-9] The incremental cost per quit of the CEASE intervention will be estimated as (total cost at 24 months for CEASE-total costs for standard care)/(Total cotinine confirmed quits at 24 months for CEASE-total cotinine confirmed quits at 24 months for standard care). Exploratory analyses will also consider the incremental costs associated with sustaining the intervention beyond the first year, by measuring costs (from months 19 to 24) and sustainability [measured by level (%) given quitting assistance at 24-months]. Development costs for CEASE will not be included because the intervention already exists; instead we will calculate the cost of implementing and sustaining the systems changes that yield a given level of service delivery and cessation. Direct costs include the CEASE intervention staff time to support the practice leader and time pediatricians and office staff take to learn how to use the online module, NRT, monthly materials, newsletter, listserve monitoring and maintenance. It is expected that initial trainings and materials (implementation) will be greater than the costs to maintain the intervention over time. We will use Monte Carlo simulation methods to develop confidence bounds on our cost-per-quit estimates. Following standard methods of economic evaluation as we have done in other studies, we will also perform parameter-specific sensitivity analyses in which individual parameters are varied singly and in combination, through plausible ranges to assess the relative impact different elements of the program have on overall cost-effectiveness.[8-10]

H3 Leadership support, EHR integration, program institutionalization, and environmental factors (quitline accessibility, billing for services) will correlate with delivery of cessation

assistance. In exploratory fashion individual practice sustainability will be assessed using regular practice feedback from the online module to determine what factors may account for higher or lower levels of sustainability. Leadership support, EHR integration, program institutionalization, community and environmental factors (quitline accessibility, local smokefree laws, billing for services) will be correlated with delivery of cessation assistance and each practices' sustainability rank. *All component processes (including exploratory implementational, organizational, and environmental sustainability factors)* have been added to the online module as an ongoing self-monitoring feature to improve and study key components of module use patterns as well as adoption, implementation, and maintenance of the intervention in this trial. Process results will therefore be used as feedback to practices at the three time points (after completion of each instance of practice feedback). Other proposed measures of sustainability such as dissemination or actual secondary spread to other satellite sites will be tracked and reported as part of the sustainability outcomes analysis.

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