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## Parental Tobacco Screening and Counseling in the Pediatric Emergency Department: Practitioners' Attitudes, Perceived Barriers, and Suggestions for Implementation and Maintenance

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### Abstract

**Objective**—The pediatric emergency department (PED) is a venue that underutilizes parental tobacco screening and brief cessation counseling. We sought to explore PED practitioners' attitudes and perceived barriers regarding the implementation and adoption of tobacco screening/cessation counseling of parental smokers in the PED setting, and to solicit suggestions for improving the sustainability and maintenance of such practices.

**Methods**—We conducted an exploratory, qualitative study of a convenience sample of PED practitioners using the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework. Individual, focused interviews were conducted to determine factors that would maximize the implementation and maintenance of parental tobacco screening and intervention counseling as standard PED practice.

**Results**—Thirty interviews were conducted from which relevant data, patterns, and themes were identified. **Reach** factors included targeting parental smokers with children with respiratory diseases, having adequate training of practitioners, and providing “pre-arranged” counseling packages. **Effectiveness** factors included practitioner desire for outcome data about intervention effectiveness (e.g., changes in children's secondhand smoke exposure and parental quit rates). Solutions to increase intervention **adoption** included quick electronic health record prompts and the provision of on-site tobacco cessation experts. **Implementation** suggestions emphasized the importance of financial support and the alignment of tobacco screening/counseling with strategic

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plans. **Maintenance** factors included institutional and technical support, and the importance of intervention “champions” in the PED.

**Conclusions**—By highlighting important viewpoints of practitioners regarding tobacco screening and counseling, the findings can help guide and direct the development and evaluation of sustainable interventions to facilitate tobacco use treatment in the PED.

Over a decade has passed since the introduction of the *Clinical Practice Guidelines for Treating Tobacco Use and Dependence*, which recommends a “5A’s” approach – Ask about tobacco use, Advice to quit, Assess willingness to quit, Assist those who wish to quit, and Arrange for follow-up.<sup>1-3</sup> In 2006, an American College of Emergency Physicians (ACEP) task force of professional emergency medicine organizations summarized recommendations for tobacco control. They stated that: (1) emergency departments (EDs) should be utilized as a venue to launch tobacco cessation efforts; and (2) ED-based tobacco control efforts may constitute “high-impact, high-reach, low-efficacy interventions”, however further investigation to identify the most effective ED-based practices for screening, advising, and referring smokers to treatment is needed.<sup>4</sup> Since that time, studies conducted in adult healthcare settings evaluating the use of electronic health records (EHR) as a way to increase adherence to the “5As” approach have demonstrated some success -- predominantly in the “Ask” about tobacco use step and in the “Arrange” for follow-up or referral to cessation counseling, step. However, limited compliance was noted for the remaining 5A’s: Advice to quit, Assess willingness to quit, or Assist those who wish to quit.<sup>2,5-9</sup>

In parallel with ACEP’s efforts, pediatric practitioners, policy makers, and public health advocates have recognized the urgent need to intervene on second hand smoke exposure (SHSe) on children. The American Academy of Pediatrics (AAP) has published a policy statement recognizing tobacco use as a “pediatric disease,” as children of smokers exposed to high rates of SHSe have higher SHSe-related morbidity risk.<sup>10-15</sup> Clinicians who care for children are thus urged to advise all parents to quit smoking as a way to promote the health of children.<sup>10</sup> Despite these recommendations, practitioners who care for pediatric patients do not routinely screen or advise parental smokers about ways to quit smoking.<sup>1,10,11,14</sup> There are several existing individual- and systems-level barriers to incorporating tobacco screening and counseling of parental smokers in the pediatric primary care setting. These barriers include lack of visit time and reimbursement for these services, lack of infrastructure for parental tobacco screening and counseling, and most notably, lack of practitioner comfort in counseling adult smokers.<sup>16,17</sup>

Recent research in the pediatric emergency department (PED) setting has uncovered alarmingly high smoking rates in parents who bring their children to the pediatric emergency department.<sup>18-20</sup> This setting may be an ideal venue to implement both ACEP and AAP recommendations, by providing tobacco interventions to benefit both the parent and the child.<sup>4,21</sup> The potential impact of such PED interventions can be assessed using the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework<sup>22</sup> which is used to guide and assess intervention impact and sustainability. This framework is used to investigate behavioral change, understand evaluation of the impact of interventions in real-world settings, and facilitate the translation of research into practice (See Table 1). Using

this framework, impact is defined as the product of reach (the number of people who would use the intervention) and efficacy (the percentage of people who use and benefit from the intervention).<sup>4,23,24</sup> Therefore, using a conservative 30% prevalence rate for smoking among adults who bring their children to the pediatric emergency department, and a conservative 1% cessation rate, PED-based tobacco cessation interventions could have a significant positive impact on both adults (30,000 fewer smokers) and their children.<sup>4,21,25</sup>

In an effort to develop PED parental smoking intervention strategies, we sought to understand existing barriers, and create potential solutions to implementation. The primary objective was to explore PED nurses' and physicians' attitudes and perceived barriers that would prevent the implementation and adoption of tobacco screening and cessation counseling of parental smokers into standard PED practice. Secondary objectives were to solicit suggestions from PED practitioners for improving the sustainability and maintenance of such PED practices.

## Methods

### Study Design

We conducted an exploratory, qualitative study of PED practitioners using a deductive framework approach.<sup>26–28</sup> Researchers have used qualitative methods to identify factors that influence integration, implementation, and maintenance of clinical protocols among ED personnel.<sup>29–31</sup> In this study, we used these methods to conduct semi-structured, focused interviews of nurses and attending physicians to assess their views on integrating tobacco screening and treatment interventions into the pediatric emergency department.

We used the RE-AIM framework to guide the interview process and data analysis. We developed focused interview questions structured to help determine factors that would maximize the implementation and maintenance of parental tobacco screening and brief intervention counseling as part of standard PED practice.<sup>32</sup> We elicited responses that reflected the positive attitudes, approaches, and solutions that practitioners believed would result in effective translation. We also identified practitioners' perceived barriers to implementation and sustainability. We mapped acquired data onto the important determinants of behavior outlined in the RE-AIM framework, and created specific suggestions for improving the implementation and sustainability based on the findings.

### Setting and Recruitment

We recruited a convenience sample of nurse practitioners, registered nurses, and physicians who worked in the pediatric emergency department of Cincinnati Children's Hospital Medical Center (CCHMC). CCHMC is a large, inner city U.S. Children's hospital, with over 475 beds and an annual PED census of over 124,000 in 2012, which makes it one of the busiest pediatric emergency departments in the North America. All participants were recruited via their work email and those who were interested contacted one of the investigators (MMG, CD, or ED). Investigators told potential participants about the study, and obtained informed consent from all study participants. No incentives for participation were offered; the study protocol was approved by CCHMC's institutional review board.

## Study Protocol

In-depth, semi-structured, focused interviews of practitioners were conducted by one of the study investigators (MMG, CD, or ED) who were trained in qualitative methods. Interviewers were careful to elicit information without introducing personal or systemic bias. Interviews were approximately one hour, and most were conducted in-person, at a location of the participants' choosing. One interview was completed by phone and one by email due to scheduling conflicts. Focused interviews were discontinued when all of the RE-AIM domains were sampled and when saturation of ideas, or informational redundancy, occurred.<sup>18,33,34</sup> Interviews were used to obtain relevant data, observe data patterns, organize the data into a conceptual framework, and explore and challenge the developing themes. As data collection progressed, the scripts were modified to allow the natural flow of the previous interviews. All interviews were transcribed prior to data analysis.

The interviews began with a description of the current recommendations of the Public Health Clinical Practice Guidelines for Treating Tobacco Control and Dependence and the RE-AIM framework.<sup>22</sup> Participants were then asked the following semi-structured focused interview questions that addressed each of the RE-AIM strategies:

Reach – “Do you believe that routine tobacco screening of all parents should be done in the PED? Why or why not? If not routine, then how often and on which parents?”

Efficacy – “What do you think would be measures of success in routine, universal tobacco cessation counseling?” How would the assessment of efficacy affect the amount of tobacco related screening and/or counseling that you do?”

Adoption – “What would the barriers be to conducting routine tobacco screening and counseling?”

Implementation – “What type of technical support would be required to make screening and counseling part of routine practice in the PED?”

Maintenance – “What would motivate nurses, physicians, and hospital administrators to make this part of routine practice?”

## Data Analysis

Three study investigators (MMG, CD, and ED) audited the transcripts for accuracy to the recorded data. Following the RE-AIM framework, two members of the research team (MMG and LV) used a combination of focused and open coding in the preliminary review of the transcripts.<sup>28</sup> First, they independently coded five transcripts using the primary categories of reach, effectiveness, adoption, implementation, and maintenance, and generated new codes and sub-categories, as appropriate. Where inconsistencies in the coding occurred, they came to consensus on discrepancies and developed decision rules to reduce them. Each transcript was then independently reviewed and coded according to the agreed upon framework.<sup>28</sup> Systematic procedures using the crystallization/immersion method<sup>35</sup> were used to examine and determine the most important aspects of the data. As a quality check at the end of coding, they reviewed coded text from the earliest transcripts to assess for missing concepts or themes. After saturation of ideas occurred and focused interviews

were discontinued, structural coding reports were created that synthesized emerging themes, salient points, and supporting quotations.

## Results

### Description of Study Sample

We conducted 30 in-depth focused interviews of a convenience sample of CCHMC-employed PED nurses and physicians. Interviews were conducted over a 6-month period; saturation of ideas was achieved. The majority of practitioners were physicians (73%), female (67%), White (87%), between the ages of 40–50 years (50%), had worked for 15 years or less (60%), and were never regular smokers (90%). Specifically, 89% of the RN participants were female, 100% were White, mean age (SD) of the RNs was 42 (7.5) years, 44.4% had worked for 15 years or less, and 78% were never regular smokers. None of the practitioners had received previous formal training on tobacco cessation. Half of practitioners reported “always” or “often” asking parents about their child’s SHSe; 30% reported “always” or “often” asking about parental tobacco use; and none endorsed routinely participating in any of the other 5A’s. Preliminary analyses found no statistically significant differences between nurses and physicians.

### Barriers to and Suggestions for Incorporating the 5As into Routine PED Practice, Organized According to the RE-AIM Framework

Highlights of key data points, specific suggestions, and representative quotations are presented in Tables 2–5.

**Reach**—Participants identified several factors related to whether practitioners would screen and/or counsel parents for tobacco use (see Table 2). Most practitioners felt very comfortable screening for tobacco use; however, they were uncomfortable counseling parents to quit smoking. Participants identified the need for adequate provider training as a significant barrier related to providing counseling. Participants proposed several resources that could improve intervention success, including: 1) the inclusion of a tobacco cessation expert; 2) “prearranged packages” including easy steps to giving the 5A’s, cessation resources (e.g., Quitline and referral information), and cessation pharmaceutical information; and 3) provision of PED screening and counseling for parental smokers with children with respiratory illnesses.

**Effectiveness/Efficacy**—Practitioners felt very strongly that outcome data should be given to practitioners on a regular basis to show the number of parents screened and the effects of tobacco counseling on parental cessation and children’s clinical outcomes (such as decreased PED visits for pediatric SHSe-related illnesses or parental cessation of smoking). There was strong endorsement by practitioners that they would not continue to screen and intervene if there were no evidence that these activities were resulting in improved outcomes (see Table 3.)

**Adoption of Screening and Counseling for Tobacco Use**—We identified several perceived barriers to the adoption of screening and counseling for tobacco use. The most

common barriers were: lack of time (53%); increased stress (53%); and delays in patient flow (50%). In response to these barriers, practitioners most commonly suggested having a cessation counselor on site to do the counseling, having electronic prompts in the EHR, and dividing and delegating the 5A's steps by provider role/responsibility. Participants suggested that an RN Ask about tobacco use, the physician Advise to quit, and a trained cessation counselor, who was not part of the clinical care team, Assess willingness to quit, Assist those who wish to quit, and Arrange for follow-up (see Table 4).

**Implementation of the 5As into Routine Practice**—The majority of practitioners estimated that implementing screening and counseling steps into routine PED practice would take six months to one year. All practitioners said that technical support was essential to implementation, specifically the use of EHR “clicks,” “prompts,” and “flags.” Regarding the financing of such efforts, most practitioners felt that the pediatric emergency department or hospital should support the effort via: providing the technical support to develop the screening and counseling prompts, funding cessation training for providers, employing tobacco cessation experts, and having cessation resources available in the pediatric emergency department. It was further noted that this effort should be “aligned with the hospital’s strategic plan and work.” Please see Table 5.

**Maintenance of the Intervention**—Participants identified four major factors influencing maintenance of the intervention after the initial implementation: 1) institutional support, 2) technical support, 3) motivators, and 4) refreshers.

**Institutional support:** The majority of practitioners felt that it would be essential to have PED leadership support a smoking cessation initiative. There were multiple opinions and suggestions on how to do this, including hiring health educators and/or cessation counselors, cessation counseling groups, monetary support for supplies and equipment, expansion of this intervention to other parts of the hospital, and identification of intervention “champions” or “mavens.” These latter individuals were described as either nurses or physicians who would encourage and train practitioners to screen and counsel parents, problem solve, provide feedback, and push the group to continue the intervention.

**Technical support:** Practitioners again suggested technical support in the maintenance of the intervention. Specifically, it was important for providers to have a “self-sufficient” electronic system which would be easy to navigate, and would have prompts to facilitate use.

**Motivators:** Practitioners reported the following motivators that would encourage maintenance (in order of importance): 1) reimbursement from insurance companies, especially Medicaid; 2) maintenance of certification (MOC) credit; 3) Pediatric emergency department/hospital mandate; 4) continuing education credit; 5) making it part of the annual credentialing/evaluation process; and 6) disseminating information on outcome measures listed in Table 3.

**Refreshers:** Practitioners felt that refreshers courses highlighting key intervention steps and updates on new evidence-based cessation counseling would likely be necessary, but they



emphasized that refreshers should not be extensive or burdensome. Suggestions included online updates and announcements and dissemination of outcomes and compliance at staff meetings. A minority of practitioners felt that annual online refreshers would be necessary. However, most practitioners felt that training should be mandatory for new hires.

## Discussion

This study examined PED practitioners' attitudes, perceived barriers, and suggestions regarding the integration of tobacco screening and cessation counseling of parental smokers into standard PED practice. By using the conceptual model of the RE-AIM framework, we were able to elicit suggestions from practitioners that would potentially facilitate the integration of these intervention steps after introduction.

Reach factors that were deemed important by practitioners included, targeting parental smokers who have children with respiratory diseases, the need for adequate screening training, having "pre-arranged" counseling packages, and ancillary staff trained in tobacco counseling. These findings are similar to those of other studies in which pediatric practitioners cite lack of time, training, standardized protocols, and materials as key reasons why they do not implement the "5As" approach to tobacco control.<sup>36,37</sup> The finding that pediatric clinicians would feel more comfortable providing this intervention to parental smokers who have children with respiratory disease is not surprising, given that clinicians who care for adults are more likely to provide the 5A's for adult patients with chronic diseases, especially those associated with tobacco.<sup>8,38</sup>

In terms of effectiveness, practitioners expressed the desire to see outcome data about the effect of the intervention on parental smoking and children's exposure to SHS. This desire for the provision of outcome measures (e.g., smoking quit rates) is consistent with other practitioners who provide tobacco treatment in adult primary care settings.<sup>5,6</sup> These results are also in line with the large body of evidence suggesting that practitioners receiving such outcome measures, and feedback on their "performance" of providing tobacco treatment, are more likely to provide tobacco treatment for adult smokers.<sup>8,9,39,40</sup>

Solutions associated with adoption of the intervention involved the use of EHR prompts. It was noted that these prompts would need to be: easy to use, template-driven, with interfaces that included drop boxes and auto-population features, giving clinicians easy counseling tips. These preferences are consistent with a systematic review on ways to improve the implementation of EHR systems in clinical practices<sup>41</sup> which recommends the use of quality factors such as templates,<sup>42,43</sup> seamless interface designs,<sup>44-47</sup> and easy to use prompts.<sup>48</sup>

Implementation suggestions emphasized the importance of financial support and alignment or prioritization of tobacco screening and counseling with strategic planning. These suggestions, and the need to make integration a priority, as well as the provision of dedicated time and resources, are consistent with strategies that improve successful integration of tobacco treatment and other preventive treatments into the EHR.<sup>41,46,49,50</sup>

Maintenance factors included the need for institutional and technical support and the importance of PED "champions" and experts to support the intervention. These findings are

consistent with those from other studies which posit a need for leadership and technical support, quality training, and champions,<sup>50,51</sup> in order to successfully maintain a newly integrated intervention even after the initial training and implementation periods.<sup>8,52,53</sup> It is also noteworthy that a common theme elicited for almost each of the RE-AIM steps was the need for a tobacco cessation expert to help provide the tobacco cessation counseling beyond the “Ask” and “Advise” steps given by practitioners. This team-based approach is encouraged in the clinical practice guidelines and in recent literature because it is being increasingly recognized that even though more clinicians are developing the knowledge and skills to treat tobacco dependence, the time constraints of doing so in a busy clinical setting limits their ability to deliver such treatment. Thus, it is recommended that busy clinical settings adopt a new, more efficient model of care for tobacco dependence that includes a tobacco treatment specialist (TTS) that has the time and expertise to provide smokers with a wide range of current tobacco treatment options.<sup>1,54</sup> In this model, the nurse or physician does the “Ask” and “Advise” step, but then a tobacco treatment specialist (TTS) can provide on-site counseling tailored to the parents’ interest in quitting. This approach will relieve the barriers and resistance that practitioners may have and will “spread the burden” by capitalizing on each type of providers’ strengths and interactions with the parent. Of course, each PED will need to adapt their approach to providing tobacco treatment depending on their budget, resources, and parent population.

### Limitations

The current study has several limitations. First, this was a convenience sample of PED practitioners in one urban tertiary care children’s hospital with a predominantly Caucasian practitioner sample. Thus, viewpoints noted in the results may not be representative of larger populations of PED providers. In addition, the PED in which this study was conducted has a large EHR system in place, therefore practitioner recommendations and suggestions may be skewed towards the capabilities of this clinical setting. Hence, we encourage other sites to assess barriers and suggestions specific to their particular setting. Lastly, this study used the RE-AIM framework. It is possible that additional models, methods and measures may provide more comprehensive suggestions for improving parental tobacco screening and counseling in the pediatric emergency department, and may affect the type, delivery, and quality of clinical care to PED patients.

Limitations notwithstanding, this study highlights important viewpoints of PED practitioners regarding tobacco screening and counseling which have not been previously described. We believe that practitioner input is the first step in the successful integration and maintenance of tobacco interventions into the routine PED visit. This preliminary qualitative phase is deemed essential by program planning experts in the development of intervention programs that have long-term sustainability.<sup>53,55,56</sup> By elucidating the perceived barriers and attitudes that practitioners have to each of the RE-AIM steps, and eliciting their suggestions for incorporating and sustaining this type of intervention into routine care, this study may help to guide and direct the development and future evaluation of tobacco screening and cessation counseling in the pediatric emergency department. Further, it may be useful as an initial model to help inform and facilitate the development process of other systems change interventions in PED settings.



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## References

1. Fiore, MC.; Jaén, CR.; Baker, TB., et al. Clinical practice guideline. Vol. 5. Rockville, MD: US Department of Health and Human Services. Public Health Service; 2008. Treating tobacco use and dependence: 2008 update.
2. Lindholm C, Adsit R, Bain P, et al. A demonstration project for using the electronic health record to identify and treat tobacco users. *WMJ*. 2010; 109:335–340. [PubMed: 21287886]
3. Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane database of systematic reviews (Online)*. 2004:CD000165.
4. Bernstein SL, Boudreaux ED, Cydulka RK, et al. Tobacco control interventions in the emergency department: a joint statement of emergency medicine organizations. *Ann Emerg Med*. 2006; 48:e417–e426. [PubMed: 16997678]
5. Boyle R, Solberg L, Fiore M. Use of electronic health records to support smoking cessation. *Cochrane database of systematic reviews (Online)*. 2011:CD008743.
6. Boyle RG, Solberg LI, Fiore MC. Electronic medical records to increase the clinical treatment of tobacco dependence: a systematic review. *Am J Prev Med*. 2010; 39:S77–S82. [PubMed: 21074681]
7. Linder JA, Rigotti NA, Schneider LI, Kelley JH, Brawarsky P, Haas JS. An electronic health record-based intervention to improve tobacco treatment in primary care: a cluster-randomized controlled trial. *Arch Intern Med*. 2009; 169:781–787. [PubMed: 19398690]
8. Bentz CJ, Bayley KB, Bonin KE, et al. Provider feedback to improve 5A's tobacco cessation in primary care: a cluster randomized clinical trial. *Nicotine Tob Res*. 2007; 9:341–349. [PubMed: 17365766]
9. Kruse GR, Kelley JH, Linder JA, Park ER, Rigotti NA. Implementation of an electronic health record-based care management system to improve tobacco treatment. *J Gen Intern Med*. 2012; 27:1690–1696. [PubMed: 22865018]
10. American Academy of Pediatrics. Policy statement--Tobacco use: a pediatric disease. *Pediatrics*. 2009; 124:1474–1487. [PubMed: 19841108]
11. Tyc VL, Hovell MF, Winickoff J. Reducing secondhand smoke exposure among children and adolescents: emerging issues for intervening with medically at-risk youth. *J Pediatr Psychol*. 2008; 33:145–155. [PubMed: 18192298]
12. Winickoff JP, Van Cleave J, Oreskovic NM. Tobacco smoke exposure and chronic conditions of childhood. *Pediatrics*. 2010; 126:e251–e252. [PubMed: 20587681]
13. Jones LL, Hassanien A, Cook DG, Britton J, Leonardi-Bee J. Parental smoking and the risk of middle ear disease in children: a systematic review and meta-analysis. *Arch Pediatr Adolesc Med*. 2012; 166:18–27. [PubMed: 21893640]
14. Prokhorov AV, Winickoff JP, Ahluwalia JS, et al. Youth tobacco use: a global perspective for child health care clinicians. *Pediatrics*. 2006; 118:e890–e903. [PubMed: 16950972]
15. Oberg M, Jaakkola MS, Woodward A, Peruga A, Pruss-Ustun A. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *Lancet*. 2011; 377:139–146. [PubMed: 21112082]
16. Geller AC, Brooks DR, Woodring B, et al. Smoking Cessation Counseling for Parents During Child Hospitalization: A National Survey of Pediatric Nurses. *Public Health Nurs*. 2011; 28:475–484. [PubMed: 22092457]
17. Deckter L, Mahabee-Gittens EM, Gordon JS. Are pediatric ED nurses delivering tobacco cessation advice to parents? *J Emerg Nurs*. 2009; 35:402–405. [PubMed: 19748018]
18. Mahabee-Gittens EM, Gordon JS, Krugh ME, Henry B, Leonard AC. A smoking cessation intervention plus proactive quitline referral in the pediatric emergency department: a pilot study. *Nicotine Tob Res*. 2008; 10:1745–1751. [PubMed: 19023825]

19. Mahabee-Gittens EM, Huang B. ED environmental tobacco smoke counseling. *Am J Emerg Med.* 2005; 23:916–918. [PubMed: 16291459]
20. Mahabee-Gittens M. Smoking in parents of children with asthma and bronchiolitis in a pediatric emergency department. *Pediatr Emerg Care.* 2002; 18:4–7. [PubMed: 11862128]
21. Mahabee-Gittens EM, Gordon JS. Review of Adult Smoking Cessation Interventions Conducted in the Emergency Department and Application to the Pediatric Emergency Department Setting. *US Respiratory Disease.* 2008; 4:125–128.
22. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* 1999; 89:1322–1327. [PubMed: 10474547]
23. Akers JD, Estabrooks PA, Davy BM. Translational research: bridging the gap between long-term weight loss maintenance research and practice. *J Am Diet Assoc.* 2010; 110:1511–1522. 22 e1–22 e3. [PubMed: 20869490]
24. Glasgow RE, Klesges LM, Dziewaltowski DA, Estabrooks PA, Vogt TM. Evaluating the impact of health promotion programs: using the RE-AIM framework to form summary measures for decision making involving complex issues. *Health Educ Res.* 2006; 21:688–694. [PubMed: 16945984]
25. Pitts SR, Niska RW, Xu J, Burt CW. National Hospital Ambulatory Medical Care Survey: 2006 emergency department summary. *National health statistics reports.* 2008:1–38. [PubMed: 18958996]
26. Burns, N.; Grove, SK. *The Practice of Nursing Research: Conduct, Critique & Utilization.* 5th ed.. St. Louis Missouri: Elsevier Saunders; 2005.
27. Sandelowski M. *Theory unmasked: the uses and guises of theory in qualitative research.* Nursing & Health. 1993; 16:213–218.
28. Ritchie, J.; Spencer, L. *Analyzing qualitative data.* London and New York: Routledge; 1994.
29. Leonard JC, Scharff DP, Koors V, et al. A qualitative assessment of factors that influence emergency medical services partnerships in prehospital research. *Acad Emerg Med.* 2012; 19:161–173. [PubMed: 22320367]
30. Bigham BL, Aufderheide TP, Davis DP, et al. Knowledge translation in emergency medical services: a qualitative survey of barriers to guideline implementation. *Resuscitation.* 2010; 81:836–840. [PubMed: 20398994]
31. Sasson C, Forman J, Krass D, et al. A qualitative study to understand barriers to implementation of national guidelines for prehospital termination of unsuccessful resuscitation efforts. *Prehosp Emerg Care.* 2010; 14:250–258. [PubMed: 20144019]
32. Glasgow RE, Lichtenstein E, Marcus AC. Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *Am J Public Health.* 2003; 93:1261–1267. [PubMed: 12893608]
33. Tuckett AG. Qualitative research sampling: the very real complexities. *Nurse researcher.* 2004; 12:47–61. [PubMed: 15493214]
34. Tuckett AG. Applying thematic analysis theory to practice: a researcher's experience. *Contemp Nurse.* 2005; 19:75–87. [PubMed: 16167437]
35. Borkan, BF. Immersion/Crystalization. In: Crabtree, BF.; Miller, WL., editors. *Doing qualitative research.* 2nd ed.. Thousand Oaks, Calif: Sage; 1999. p. 179-194.
36. Conroy MB, Majchrzak NE, Silverman CB, et al. Measuring provider adherence to tobacco treatment guidelines: a comparison of electronic medical record review, patient survey, and provider survey. *Nicotine Tob Res.* 2005; 7(Suppl 1):S35–S43. [PubMed: 16036268]
37. Quinn VP, Stevens VJ, Hollis JF, et al. Tobacco-cessation services and patient satisfaction in nine nonprofit HMOs. *Am J Prev Med.* 2005; 29:77–84. [PubMed: 16005802]
38. Ferketich AK, Khan Y, Wewers ME. Are physicians asking about tobacco use and assisting with cessation? Results from the 2001–2004 national ambulatory medical care survey (NAMCS). *Prev Med.* 2006; 43:472–476. [PubMed: 16920185]
39. McMenamin SB, Bellows NM, Halpin HA, Rittenhouse DR, Casalino LP, Shortell SM. Adoption of policies to treat tobacco dependence in U.S. medical groups. *Am J Prev Med.* 2010; 39:449–456. [PubMed: 20965382]

40. Ivers N, Jamtvedt G, Flottorp S, et al. Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane database of systematic reviews (Online)*. 2012; 6:CD000259.
41. Lau F, Price M, Boyd J, Partridge C, Bell H, Raworth R. Impact of electronic medical record on physician practice in office settings: a systematic review. *BMC medical informatics and decision making*. 2012; 12:10. [PubMed: 22364529]
42. Bolger-Harris H, Schattner P, Saunders M. Using computer based templates for chronic disease management. *Aust Fam Physician*. 2008; 37:285. [PubMed: 18398531]
43. Ludwick D, Doucette J. Primary care physicians' experience with electronic medical records: barriers to implementation in a fee-for-service environment. *International Journal of Telemedicine and Applications*. 2009; 2009:2.
44. Crosson JC, Ohman-Strickland PA, Hahn KA, et al. Electronic medical records and diabetes quality of care: results from a sample of family medicine practices. *The Annals of Family Medicine*. 2007; 5:209–215.
45. Linder JA, Ma J, Bates DW, Middleton B, Stafford RS. Electronic health record use and the quality of ambulatory care in the United States. *Arch Intern Med*. 2007; 167:1400–1405. [PubMed: 17620534]
46. Samoutis G, Soteriades E, Kounalakis D, Zachaiadou T, Philathis A. implementation of an electronic medical record system in previously computer-naive primary care centres: a pilot study from cyprus. *Informatics in primary care*. 2007:207–216.
47. Tamblyn R, Huang A, Taylor L, et al. A randomized trial of the effectiveness of on-demand versus computer-triggered drug decision support in primary care. *J Am Med Inform Assoc*. 2008; 15:430–438. [PubMed: 18436904]
48. Frank OR, Litt JCB, Beilby JJ. Opportunistic electronic reminders: improving performance of preventive care in general practice. *Aust Fam Physician*. 2004; 33:87–90. [PubMed: 14988972]
49. Randeree E. Exploring physician adoption of EMRs: a multi-case analysis. *J Med Syst*. 2007; 31:489–496. [PubMed: 18041282]
50. Wells S, Furness S, Rafter N, et al. Integrated electronic decision support increases cardiovascular disease risk assessment four fold in routine primary care practice. *European Journal of Cardiovascular Prevention & Rehabilitation*. 2008; 15:173–178. [PubMed: 18391644]
51. Miller RH, West C, Brown TM, Sim I, Ganchoff C. The value of electronic health records in solo or small group practices. *Health Aff (Millwood)*. 2005; 24:1127–1137. [PubMed: 16162555]
52. Denomme LB, Terry AL, Brown JB, Thind A, Stewart M. Primary health care teams' experience of electronic medical record use after adoption. *Fam Med*. 2011; 43:638–642. [PubMed: 22002775]
53. Studer M. The effect of organizational factors on the effectiveness of EMR system implementation--what have we learned? *Healthc Q*. 2005; 8:92–98. [PubMed: 16323520]
54. Hurt RD, Ebbert JO, Hays JT, McFadden DD. Treating tobacco dependence in a medical setting. *CA Cancer J Clin*. 2009; 59:314–326. [PubMed: 19706827]
55. Johnson K, Hays C, Center H, Daley C. Building capacity and sustainable prevention innovations: a sustainability planning model. *Elsevier*. 2004:135–149.
56. Pluye P, Potvin L, Denis JL, Pelletier J. Program sustainability: focus on organizational routines. *Health Promot Int*. 2004; 19:489–500. [PubMed: 15520036]

**Table 1**

Description of the adapted reach, efficacy, adoption, implementation, and maintenance (RE-AIM) dimensions with examples of the focused interview questions that were used. Definitions and questions were adapted to the study aims.

<b>Dimension</b>	<b>Definition</b>	<b>Sample Questions</b>
<b>Reach</b>	The proportion of individuals willing to participate in tobacco screening and intervention and the parents that they would be willing to target	<p>“How comfortable do you feel you are at screening and/or counseling parents to quit smoking?”</p> <p>“Is there a particular subset of smokers that you feel should take priority in getting smoking screening and/or cessation counseling?”</p>
<b>Effectiveness</b>	The demonstration of the influence of an intervention on important outcomes, including how this affects compliance with the intervention	<p>“What do you think would be measures of success in routine, universal tobacco screening?”</p> <p>“How important is it to show efficacy and how would the assessment of efficacy affect the amount of screening and counseling that you do?”</p>
<b>Adoption</b>	The proportion and type of staff who would be willing to adopt the intervention steps and perceived barriers and solutions to adoption	<p>“Who should administer each intervention component?”</p> <p>“What would the barriers be to conducting routine screening and counseling?”</p> <p>“How would screening and counseling affect patient flow, stress levels, work load, etc?”</p> <p>“What training and electronic support are needed?”</p>
<b>Implementation</b>	The amount of time, technical support, and money necessary to make the intervention part of routine practice.	<p>“What type of technical support would be required to make screening and counseling part of routine practice in the ED<sup>1</sup>?”</p>
<b>Maintenance</b>	The extent of which participants will make and maintain this screening and counseling behavior change and the sustainability of the intervention in the ED setting.	<p>“What kind of institutional support would be needed to maintain this intervention in the ED setting?”</p> <p>“Who would be responsible for monitoring this?”</p> <p>“What type and timing of training refreshers would be necessary?”</p> <p>“What would motivate practitioners to keep this part of routine practice?”</p>

<sup>1</sup>ED = Emergency Department

**Table 2**

“Reach” factors that affect the likelihood of participation and the parental subgroup that practitioners will screen and counsel for tobacco use.

Factor	Explanation	Sample Responses
Comfortable screening, not counseling	Belief that the parents need individualized counseling based on where they are on the stage of change continuum; don't want to screen unless they will do something with the screening results	“I am uncomfortable because it is a somewhat embarrassing and sensitive topic and I don't want people to feel bad, although I think it is inevitable.”
Subset that should be screened (in order of preference)	<ul style="list-style-type: none"> <li>• Respiratory illness (e.g., asthma, bronchiolitis)</li> <li>• Otitis Media</li> <li>• Upper respiratory illnesses</li> <li>• Babies/toddlers</li> </ul>	<p>“Screening should not be routine on everyone; the ED<sup>I</sup> is still for emergencies.”</p> <p>“Parents of the subset of “respiratory” patients should be targeted since secondhand smoke poses significant health effects to them”</p>

<sup>I</sup>ED = Emergency Department

**Table 3**

Outcome data that practitioners feel would make the intervention appear effective and would increase their likelihood of screening and counseling about tobacco use.

Outcome Data	Sample Responses
<p data-bbox="217 401 298 422"><u>Screening</u></p> <p data-bbox="217 443 894 489">Complete documentation that screening was done with data captured from the EHR<sup>1</sup> that specifies:</p> <ul data-bbox="266 506 894 659" style="list-style-type: none"> <li data-bbox="266 506 477 527">• How many screened</li> <li data-bbox="266 541 894 583">• How many currently smoke and/or expose their children to second hand smoke</li> <li data-bbox="266 598 618 619">• How many want to receive counseling</li> <li data-bbox="266 634 505 655">• How many want to quit</li> </ul>	<p data-bbox="927 443 1377 485">“Instead of them just making us do it, showing efficacy would make me have more of an interest in it.”</p> <p data-bbox="927 499 1377 541">“If even one person in 100 stops smoking because of the effort, it is worth it.”</p>
<p data-bbox="217 695 310 716"><u>Counseling</u></p> <p data-bbox="217 730 894 777">Complete documentation screening was done with data captured from the EHR that specifies:</p> <ul data-bbox="266 793 894 974" style="list-style-type: none"> <li data-bbox="266 793 630 814">• Cut down, “took the next step”, or Quit</li> <li data-bbox="266 829 477 850">• Filled a prescription</li> <li data-bbox="266 865 667 886">• Followed up with QL,<sup>2</sup> counseling, or PCP<sup>3</sup></li> <li data-bbox="266 900 516 921">• Change in child’s SHSe<sup>4</sup></li> <li data-bbox="266 936 727 957">• Change in child’s ED visits for respiratory illnesses</li> </ul>	<p data-bbox="927 730 1377 863">“I want to see that 100% of parents who after being approached about cessation, receive education, referrals, and even consultation about cessation. And then, that there was a change in attitude or patterns, either following up in appointment, filling prescriptions, or actual change in behavior at home.”</p>

<sup>1</sup>EHR = Electronic Health Record

<sup>2</sup>QL = Quitline

<sup>3</sup>PCP = Primary Care Provider

<sup>4</sup>SHSe = Secondhand smoke exposure



**Table 4**

## Positive solutions that will counteract concerns about Adoption

Area of Concern	Solution	Sample Responses
Time and Stress	No effect on time or stress level if only screening is required but counseling is done by trained personnel. RN <sup>1</sup> or RT <sup>2</sup> should screen, and the MD <sup>3</sup> should solely reinforce the message that quitting will help their child's health, but a trained cessation counselor should do the assessing and assisting.	<p>"No stress if done is a "systematic, organized studied way"</p> <p>"Make it easy and quick - Epic prompts and flags... we want EPIC autopopulation to help with the next steps based on parent answers."</p> <p>"I think that effectiveness (of the intervention) and respect depends on the individual and their approach to it, not their title... (counseling should be done by) someone completely outside of the care team."</p> <p>We don't need an MD or RN to do this. The ED<sup>4</sup> is already a place where demand outstrips capacity; the only right to healthcare we have anymore is the right to emergency/trauma care. And we can't even do what we need to do, so why would we add extra? This should be exactly like a scribe, push the work down to someone who can do it."</p> <p>"If I have to do it, it will negatively affect my load. I can tell you straight out-I do not want to be the one doing it."</p>
Patient Flow	<p>No effect on flow if (in order of preference):</p> <ol style="list-style-type: none"> <li>1 Done during natural wait times</li> <li>2 Done after discharge</li> <li>3 In another room (and not the patient's room) by a trained tobacco counselor who can tailor counseling to the parent who is interested in quitting.</li> </ol>	<p>"Depends on: where it's done, how it's done, and who does it."</p> <p>"In a perfect world, it would be best if you hire a whole group of people who deal with this – meaning, screen with ED staff, then have other individuals trained for the other parts who can help while the patient and parents are waiting in the ED."</p> <p>"At triage I don't think this is an appropriate time/place to address the use of tobacco since there is no way of initiating interventions at that time. I feel like it is a question that gets asked but nothing ever gets done with the information, therefore I tend not to ask at triage."</p>

<sup>1</sup>RN = Registered Nurse

<sup>2</sup>RT = Respiratory Therapist

<sup>3</sup>D = Medical Doctor

<sup>4</sup>ED = Emergency Department

**Table 5**

Factors that would enhance Implementation of the intervention steps into routine pediatric emergency department practice

Factors	Data	Sample Responses
Technical Support	Practitioners emphasized the attractiveness of: <ul style="list-style-type: none"> <li>• “clicks”</li> <li>• EHR<sup>1</sup> order sets with “drop-downs”</li> <li>• completion “flags”</li> </ul>	<p>“...One click to do the screening which is linked to the (secondhand smoke-related) chief complaint...(this click) starts the (intervention) process, then a second click sets off the counseling cascade.”</p> <p>“...Clicks” that “auto-populate to the next steps”</p> <p>“Epic order set with drop-downs to facilitate the counseling” or an “EPIC order for a cessation counselor.”</p> <p>“...flags that are visible to the physician that shows the identification of parental smokers and indicate that each step (e.g., advice, pamphlets, referrals) was given.”</p>
Financial support	Necessary for: <ul style="list-style-type: none"> <li>• technical help</li> <li>• cessation counseling training</li> <li>• tobacco cessation experts</li> <li>• cessation resources</li> </ul>	<p>“We need financial support for this effort because:</p> <p>... this ultimately relates to our mission of being leaders in providing improved outcomes to the patients we serve”</p> <p>...this is a major determinant in the health and recidivism of our patients and one of our clinical priorities is to improve asthma care”</p> <p>... I think that for certain families it (second hand smoke) probably plays a big role in how often their kids get sick and severity of illness and that counseling will prevent future illnesses.”</p> <p>“...A tobacco cessation counselor or someone whose area of expertise is smoking cessation. I think that in a primary care setting, the doctor has a lot of influence, that is assuming that the doc/patient have good rapport. In the ED<sup>2</sup> setting, I think the clinician should be removed from these discussions, because from a patient’s perspective, it would be hard to think that it wasn’t affecting their child’s care.”</p>

<sup>1</sup> EHR = Electronic Health Record

<sup>2</sup> ED = Emergency department