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ORIGINAL RESEARCH

General Medicine

Physician-directed smoking cessation using patient "opt-out" approach in the emergency department: A pilot program

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Abstract

Objective: Using a physician-directed, patient "opt-out" approach to prescriptive smoking cessation in the emergency department (ED) setting, we set out to describe patient actions as they related to smoking cessation behaviors.

Methods: A convenience sample of smokers at 2 Pennsylvania hospital EDs who met inclusion/exclusion criteria were approached to participate in a brief intervention known as screening, treatment initiation, and referral (STIR) counseling that included phone follow-up. Demographic information, current smoking status, and specific physician prescription and follow-up recommendations were collected. Approximately 3 months later, patients were contacted to determine current smoking status and actions taken since their ED visit.

Results: One hundred six patients were approached and 7 (6.6%) opted out of the intervention. Patients who did not opt out were evaluated for appropriate use of smoking cessation-related medications; 35 (35.4%) opted out of the prescription(s) and 6 (6.1%) were not indicated. Twenty-one (21.2%) patients opted out of ambulatory referral follow-ups with primary care and/or tobacco treatment program; one (1.0%) was not indicated for referral. Nineteen (32.8%) patients who received prescription(s) for smoking cessation-related medications initially also followed the prescription(s). Seventeen (22.1%) patients participated in referral follow-up.

Conclusion: In this small ED pilot, using the STIR concepts in an opt-out method, few smokers opted out of the smoking cessation intervention. About one-third of the patients declined prescriptions for smoking cessation-related medications and less than one-quarter declined ambulatory referrals for follow-up. These findings support

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a willingness of patients to participate in STIR and the benefits of intervention in this setting.

KEYWORDS
opt-out, emergency department, motivational interviewing, referral and consultation, screening, treatment initiation, referral, smoking cessation agents, smoking cessation

1 | INTRODUCTION

1.1 | Background

Tobacco use is the single most preventable cause of disease, disability, and death in the United States.[1] Each year, over 480,000 people die prematurely from smoking or exposure to secondhand smoke and another 16 million live with a serious illness caused by smoking.[1] Those who smoke have a decreased life expectancy of at least 10 years compared to non-smoking Americans.[1] In addition to the preventable adverse health impacts, the effects of smoking take a significant toll on the US economy. The overall economic burden to the healthcare system is over $300 billion dollars each year, with ≈$170 billion attributed to direct medical care of adults.[2] Over $156 billion is lost in productivity due to firsthand smoking, and $5.6 billion to secondhand smoke exposure.[1,2]

1.2 | Importance

The few studies that have reported rates of tobacco use in patients seeking care in the emergency department have shown great variability in prevalence (21%–41%) and report that rates are greater than that of the general population.[3-8] Prior research has found tobacco cessation management to be unappealing to some ED providers.[9] This may be attributed to the lack of familiarity by physicians with tobacco cessation strategies and the few studies in emergency medicine literature. Although tobacco cessation screening and interventions in the ED setting have been discussed, recommended, and reported,[10-22] none have measured the success of an "opt-out" approach to a prescriptive intervention.

Unlike most other medical treatments, patients normally have to "opt in" to smoking cessation services based on their readiness to quit.[23,24] Favorable outcomes have been reported for opt-out smoking cessation programs where bedside consults, referrals, and/or phone follow-up services were provided unless the patient objected in inpatient hospital settings,[25] and within populations of pregnant women.[26-30]

1.3 | Goals of this investigation

Using a physician-directed, patient opt-out approach to prescriptive smoking cessation in the ED setting, we set out to describe patient actions as they related to smoking cessation behaviors. Outcomes studied include the proportion of patients approached who opted out at any level of the intervention as well as the results of the physician interactions with those patients who did not opt out of the brief motivational interview in the ED and phone follow-up. Additionally, we sought to determine the sex-specific differences in pharmacological treatment outcomes of the ED-based tobacco cessation intervention.

2 | METHODS

2.1 | Study design and setting

A prospective quality improvement pilot study was undertaken in 2 Northeastern Pennsylvania EDs. The contributing hospitals were a level 1 trauma center with an annual census of 90,000 and a suburban hospital with an annual census of 56,000. To decrease investigator variability, a standardized script adapted from D'Onofrio et al[31] and an electronic medical record template were derived to guide the patient interview and prescriptive interventions (screening, treatment initiation, and referral [STIR]).[32] Residents and attending physicians who received training were able to conduct STIR; training involved an informal grand rounds lecture on providing STIR in the ED, as well as one-on-one coaching and supervision from the project leader on following the standardized script, prescribing, and using the electronic medical record template to record details of the intervention and any prescriptions/referrals in the patient chart.

2.2 | Selection of participants

This prospective quality improvement study was conducted over 8 months, from May 7, 2019 to December 18, 2019. A convenience sample of patients self-identifying as current smokers (as reported to ED staff and/or during initial triage and recorded in their chart), who met inclusion and exclusion criteria, were approached by previously trained residents and attending physicians to participate in a standardized smoking cessation intervention. Inclusion criteria included currently smokes tobacco, English speaking, ≥18 years of age, discharged after their ED visit, able to participate in phone follow-up, and not critically ill, incapacitated, incarcerated, or known to be currently pregnant. Exclusion criteria included does not currently smoke tobacco, not English speaking, <18 years of age, not discharged after their ED visit, not able to participate in phone follow-up, critically ill, incapacitated, incarcerated, or known to be currently pregnant. Patients who visited the ED multiple times during the study period were identified during

the screening process using the screening log. Repeat patients were included in the screening log multiple times, but if they were eligible based on inclusion and exclusion criteria, they were approached only 1 time. We did not use their multiple ED visits to reinforce the intervention because that would have created inequities among patients in the sample.

2.3 | Intervention

Consistent with current institutional standards of care, the program physicians provided a brief motivational interview concerning smoking cessation that included a "readiness to change" inventory and recommendations to facilitate tobacco abstinence – both prescription(s) for use of smoking cessation-related medications and referral(s) for follow-up with a tobacco treatment program and/or primary care provider. Patients were able to opt out at any level of the intervention (decline the invitation to discuss smoking cessation, decline physician-recommended prescription(s) for smoking cessation-related medications, or decline physician-recommended referral(s) for follow-up after ED discharge). All patients in the ED meeting inclusion and exclusion criteria were approached by members of the program team during scheduled provider times over the course of 29 weeks. Patients who received prescription(s) for smoking cessation-related medication had to take it to their pharmacy to be filled; pharmacotherapy was not given in the ED. Patients who received referral(s) for follow-up after ED discharge with a tobacco treatment program and/or primary care provider were required to make the appointment(s). At ≈3 months following their ED discharge, patients who did not opt out of the intervention and phone follow-up were contacted. A minimum of 3 patient and/or patient secondary/next of kin contact attempts were made on different dates and at different times of day to maximize follow-up contact. Voicemail messages were left for patients who did not answer.

2.4 | Outcomes

A structured data collection tool was used to gather demographic information, patient's smoking status at the time of the ED visit, specific actions recommended by the physician, and patient actions taken after ED discharge (as determined during follow-up). At the end of their initial encounter, patients were asked (5-point Likert scale) how important it was to have the conversation regarding their smoking behavior with a physician. Phone follow-ups were completed 3 months post-ED discharge to determine current smoking status and actions taken following the ED visit. At follow-up, smoking activity was determined to be present if the patient reported smoking in the last 7 days.

2.5 | Analysis

Program data were generated from the standardized collection tool used to aggregate both initial and phone follow-up patient information.

The Bottom Line

The ED is an appropriate venue for public health interventions. In a convenience sample of smokers presenting to a single, large volume, tertiary ED, more than 93% opted in to a smoking cessation plan of either medication or a referral. At 3 months, nearly one-third of these patients were using a smoking cessation medication and more than one-fifth had participated in a referral program. These findings show promise for helping smokers attempt to quit in the setting of an ED.

The study sample comprised patients who did not opt out of the brief intervention and who also agreed to be contacted 3 months following ED discharge, with a convenience sample *N* goal of 99 enrollees for this pilot set by the study team. Descriptive analysis was used for demographic data and data concerning tobacco use, and levels of opt-out were captured and described as frequencies. Amount and frequency of tobacco use (number of cigarettes/cigars per day) were recorded at initial visit and on phone follow-up, as well as whether or not the patient attempted to quit. Frequency of referral follow-up and whether prescriptions for smoking cessation-related medication were given were also captured. Data were de-identified prior to analysis, password protected, and saved in a restricted-access electronic domain to ensure patient confidentiality. The project received exemption from full board review by the institutional review board on the basis of its quality improvement study design and the nature of the work being standard care at the site of study.

3 | RESULTS

3.1 | Characteristics of study subjects

A total of 1181 patients were screened, of whom 106 met inclusion and exclusion criteria and were approached. Of these, 7 (6.6%) opted out of STIR counseling. Of those who did not opt out, the sex ratio of participants was nearly equal; 50 (50.5%) were male and 49 (49.5%) were female. The mean age and SD was 42.4 ± 14.5, ranging from 19 to 85 years old. Eighty (80.8%) reported having a primary care physician. Demographic and patient characteristics are presented in Table 1. Patient flow is summarized in Figure 1 (CONSORT Flow diagram).

3.2 | Main results

Patients (93, 93.9%) were offered prescriptions for smoking cessation-related medication per study protocol in regard to nicotine replacement therapy and oral medication as well as ambulatory referrals to primary care and/or a tobacco treatment program. An indication for

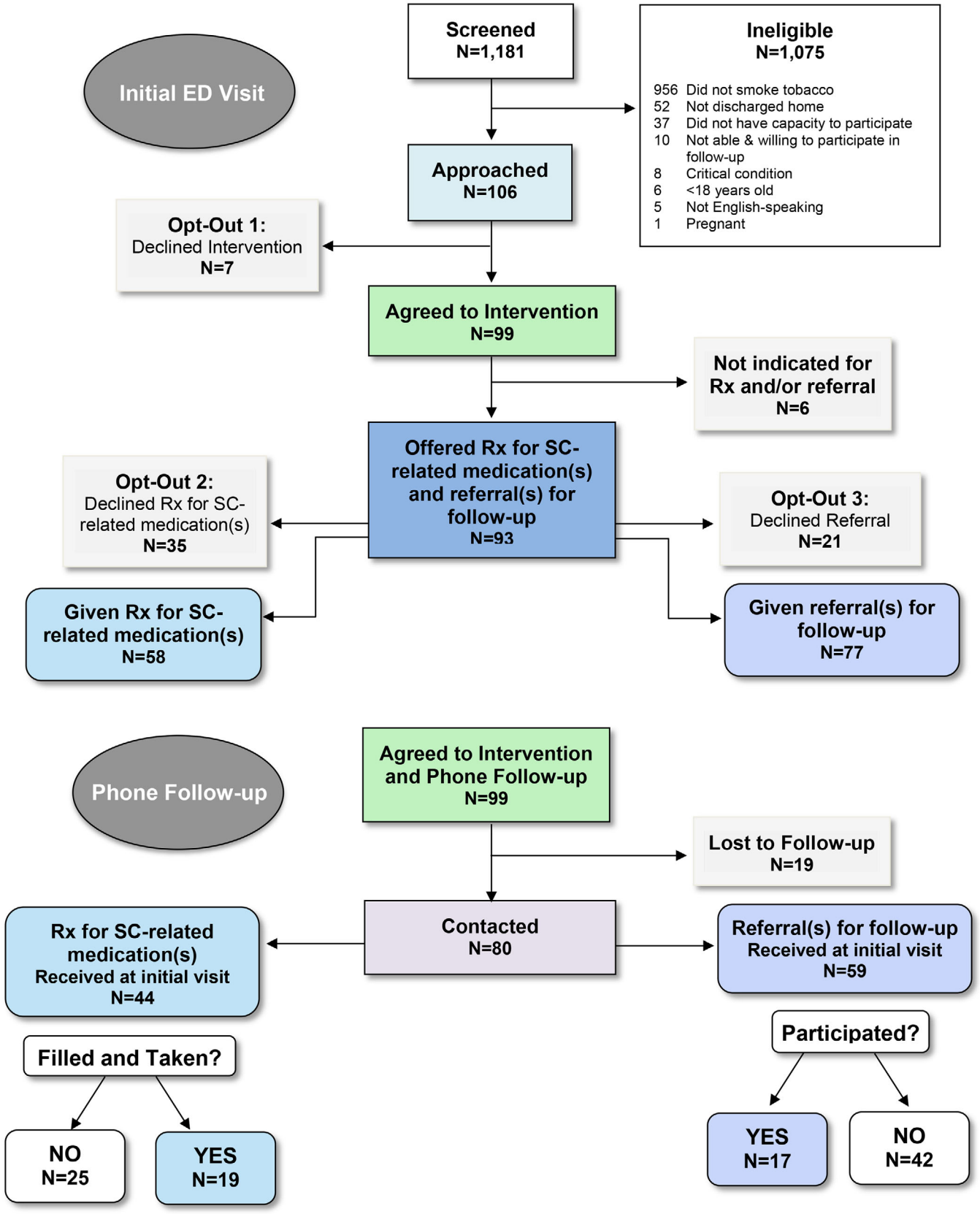

FIGURE 1 CONSORT Flow Diagram

TABLE 1 Patient demographics and characteristics

		n	%
Sex	N = 99		
Male		50	50.5
Female		49	49.5
Race/Ethnicity	N = 99		
White		81	81.8
Hispanic/Latino		8	8.1
Black		10	10.1
Insurance status	N = 99		
Private		40	40.4
Medicaid		27	27.3
Medicare		15	15.2
Worker's compensation		7	7.1
Uninsured		10	10.1
Established primary care	N = 99		
Yes		80	80.1
No		19	19.2
Where does patient usually receive healthcare?	N = 99		
Private doctor		75	75.8
ED		16	16.2
Clinic		5	5.1
Other		2	2.0
None		1	1.0

TABLE 2 Interventions and opt-outs upon initial visit

		n	%	n	%
Offered intervention	N = 106				
Agreed		99	93.4		
***(Opt-out 1)** Declined*		7	6.6		
Prescription for smoking cessation-related medication	N = 99				
Offered	93 (93.9%)				
Accepted		58	58.6		
Nicotine replacement				27	46.6
Oral medication				14	24.1
Both				17	29.3
Not indicated	6 (6.1%)				
***(Opt-out 2)** Refused*		35	35.4		
Referral follow-up	N = 99				
Offered	98 (99.0%)				
Accepted		77	77.8		
Primary care				3	3.9
Tobacco treatment program				12	15.6
Both				61	79.2
Other				1	1.3
Not indicated	1 (1.0%)				
***(Opt-out 3)** Refused*		21	21.2		

smoking cessation-related medications and/or ambulatory referrals was not present in 6 patients (6.1%). At the initial ED visit, 17 patients (17.2%) opted out of receiving prescription(s) and did not opt out of ambulatory referral(s); 1 (1.0%) opted out of ambulatory referral(s) and did not opt out of receiving prescription(s); 2 (2.0%) opted out of ambulatory referral(s) and were not indicated for prescription smoking cessation-related medication; 3 (3.0%) did not opt out of ambulatory referral(s) and were not indicated for prescription(s); 1 (1.0%) was not indicated for either the prescription(s) or ambulatory referral(s). Eighteen patients (18.2%) opted out of both prescription(s) and ambulatory referral(s). Fifty-seven patients (57.6%) did not opt out of either prescription(s) or ambulatory referral(s). Table 2 displays the frequencies of opt-outs separated by prescription smoking cessation-related medication and ambulatory referrals for follow-up.

Patients were asked to rate their readiness to change their tobacco use, using a 1 ("not ready at all") to 10 ("very ready") scale. Thirty-six (36.4%) patients rated their readiness to change their tobacco use between 1 and 5, whereas 63 (63.6%) rated their readiness to change their tobacco use between 6 and 10. Seventy-nine (79.8%) patients indicated at the conclusion of the intervention that it was important to them (Likert scale 4 or 5) that they had discussed tobacco cessation with a physician. Daily tobacco usage was recorded at initial visit as well as at phone follow-up (cigarettes/cigars per day); changes in overall reported daily usage 3 months since receiving intervention and any physician recommendations are shown in Table 3. There were 19 (19.2%) total patients who were lost to follow-up. Of the 80 patients reached, 17 (21.3%) reported quitting and 63 (78.8%) indicated that they had smoked in the last 7 days. Of those 63 patients, 28 (44.4%) attempted to quit unsuccessfully, and 33 (52.4%) had not attempted to stop smoking tobacco (2 responses were missing, 3.2%). The mean decrease in cigarettes smoked for patients who reported decreased daily usage from initial visit to follow-up was 8.4 cigarettes.

Table 4 contains the intervention results at phone follow-up. Of the 58 patients who received a prescription for smoking cessation-related medication at initial visit, 19 (32.8%) filled their prescription, 25 (43.1%) did not, and 14 (24.1%) responses were missing (lost to follow-up). Of those 19 who adhered to prescriptions, 10 (52.6%) utilized nicotine replacement therapy, 6 (31.6%) utilized oral smoking cessation aid medication, and 3 (15.8%) used both. Of the 77 patients who had received referrals at initial visit, 17 (22.1%) participated in at least one of those referrals. There were 10 patients who accepted a prescription for smoking cessation-related medication and a referral for follow-up with a tobacco treatment program and/or primary care provider (10/99; 10.1%), and received both pharmacotherapy and counseling (10/80; 12.5%). At follow-up, 8 of these 10 attempted to quit and 5 reported a decrease in smoking. Of the 42 (54.5%) patients who did not participate in referrals, insurance and disinterest were verbalized as reasons for non-participation. There were 18 (23.4%) patients who

TABLE 3 Tobacco use at initial visit and phone follow-up

	Initial visit			Phone follow-up	
		n	%	*n*	%
Currently smokes tobacco?	N = 99		N = 80		
Yes	99	100	63	78.8	
No	-	-	17	21.3	
Smokes	N = 99		N = 63		
Cigarettes	92	92.9	61	96.8	
Cigars	7	7.1	2	3.2	
How many cigarettes/day?	N = 92		N = 61		
1–10	57	62.0	41	67.2	
11–20	30	32.6	18	29.5	
21–30	4	4.3	1	1.6	
31–40	1	1.1	-	-	
Missing	-	-	1	1.6	
How many cigars/day?	N = 7		N = 2		
≤ 2	6	85.7	1	50.0	
>2	1	14.3	1	50.0	

TABLE 4 Intervention results

		n	%	n	%
Result of follow-up	N = 99				
Contacted		80	80.8		
Lost to follow-up		19	19.2		
Prescription for smoking cessation-related medications	N = 58				
Adherent		19	32.8		
Nicotine replacement				10	52.6
Oral medication				6	31.6
Both				3	15.8
Non-adherent		25	43.1		
Missing (Lost to follow-up)		14	24.1		
Referral follow-up	N = 77				
Participated		17	22.1		
Primary care				10	58.8
Tobacco treatment program				1	5.9
Both				4	23.5
Other				2	11.8
Did not participate		42	54.5		
Missing (Lost to follow-up)		18	23.4		

initially received referrals who were lost to follow-up. Some overlap occurred between lost to follow-up patients who received prescriptions and/or referrals.

The group of 99 patients who accepted the intervention at their initial visit consisted of 50 (50.5%) males and 49 (49.5%) females. Eleven (11/19, 57.9%) males and 8 (8/19, 42.1%) females were lost to follow-up. Of the 80 patients who responded at phone follow-up, 39 (48.8%) were male and 41 (51.3%) were female; 22 men (22/39, 56.4%) and 22 women (22/41, 53.7%) agreed to receive a prescription for smoking cessation-related medication at the initial visit. More men (11/22, 50.0%) than women (8/22, 36.4%) self-reported following the prescription. Of those who were contacted at follow-up, 29 (29/39, 74.4%) males and 30 (30/41, 73.1%) females agreed to a referral at the initial visit. More women (11/30, 36.7%) self-reported participating in follow-up referral compared to their male counterparts (6/29, 20.7%). Sex-specific outcomes are summarized in Table S1.

4 | LIMITATIONS

This study had a convenience sample of limited size and was implemented at 2 hospitals within the same region of northeast Pennsylvania, thus potentially limiting the generalizability of the results. Patients were only recruited based on the physicians' availability. The patients included in this study were all English speaking. Data collected may have been biased by patient recollection and self-reporting. The measure of smoking status, cigarettes/cigars smoked per day over the last 7 days, could have been a limitation in that it may not accurately describe the patient's tobacco usage. The length and frequency of follow-up may have limited further information from being gathered. Because of our study's quality improvement design, we were unable to conduct advanced statistical comparisons of inference between groups, as our institutional review board does not allow for these analytics within a quality improvement initiative. The lack of a control group in this study makes it harder to quantify the benefit of the smoking cessation intervention, and further research that includes a control is an opportunity for further study.

5 | DISCUSSION

This small prospective pilot study using STIR found that few smokers opted out of a smoking cessation intervention. The low opt-out rate (6.6%) underscores the potential effectiveness of physician-initiated STIR. These cessation results are concordant with a larger randomized control trial for smoking cessation in an ED setting, which showed an increased validated quit rate at 6 months compared to the control group that received only a smoking cessation leaflet rather than a discussion (AWARD model) albeit from retired nurses.[33] Although this randomized controlled trial utilized trained retired nurses rather than physicians, the results nevertheless concluded that brief advice made a difference in these patients' quit rates.[33] In both our study and theirs, the brief interface between patient and medical professional highlighting the personalized message of risk as well as the mortality risk associated with smoking could have been a strong contributor to patient receptiveness.

Our study may be unique as an opt-out model in the ED setting, but it has been done in other populations. A study of opt out referrals for pregnant smokers using stop smoking services found that over twice as many women set a quit date with stop smoking services and reported abstinence of smoking 4 weeks later.[29] Additionally an opt-out model was used in a hospital-based study that found that the approach positively affected short-term cessation outcomes.[25] Our study seems to align with these other specialties in its potential success as an approach especially when applied with a STIR intervention.

In regard to sex-specific outcomes, by chance, we originally began with a near 50/50 participation rate across the 2 sexes. Out of those who engaged in the follow-up process, 23.1% of the men and 19.5% of the women reported quitting (Table S1). It was reported that 56.4% of men and 53.7% of women had made an attempt to quit in the interval between intervention and follow-up (tests for significance not performed) (Table S1). It has been established that women use more healthcare services than men, including the ED.[34-38] In a primary care setting, female and male smokers were equally likely to participate in brief interventions,[39] but the impact of sex differences on cessation outcomes has not been fully assessed or established. Further study is necessary to determine if there are significant differences between the 2 groups.

Future research should focus on a larger sample size and potentially longer time frame for follow-up. Another aspect that needs further evaluation is comparing cessation in patients who received motivational interviewing with prescription therapy STIR versus patients who received only motivational interviewing. Future studies should also consider noting the participants' reasons for not utilizing their prescribed smoking cessation medications, as they could vary for instance from financial reasons to not understanding the severity of the consequences of smoking. Variable levels of categorizing smoking status or using a form of objective smoking status such as cotinine measures could be beneficial in examining any discordance with self-reporting.

In this small ED pilot using STIR concepts in a patient opt-out setting, few smokers chose not to participate in the smoking cessation intervention and the vast majority felt it was important for the physician member of the healthcare team to lead the discussion. About one-third of the patients declined prescriptions for smoking cessation-related medications and less than one-quarter declined ambulatory referrals for follow-up. At phone follow-up, many patients had decreased or stopped smoking; 32.8% of the patients reported taking the prescription(s) and 22.1% participated in follow-up. STIR showed promising acceptability and effectiveness for helping patients attempt to quit smoking. Testing in a larger sample size study using multiple sites is recommended.

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CONFLICT OF INTEREST

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AUTHOR CONTRIBUTION

All authors meet the qualifications for authorship, have made substantial contributions, approve the final manuscript, and endorse its conclusions.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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