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## Assessing the Delivery of Cessation Services to Smokers in Urban, Safety-Net Clinics

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## Abstract

Inequities in smoking behaviors continue to exist with higher rates among persons with limited formal education and for those living below the poverty. This report describes the scope of tobacco cessation services delivered to low socio-economic status (SES) patients in several primary care medical offices, considered as ‘safety-net’ sources of health care. Using a cross-sectional design, a random sample of records were reviewed for 922 smokers from 4 medical

offices. The primary outcome variable was the delivery of smoking cessation services as documented in medical records; information on patient demographics and number of visits during the past 12 months was also abstracted. Smoking status was assessed during the last office visit for 65% of smokers, 59% were advised to quit, readiness to quit was assessed for 24%, 2% indicated a willingness to quit within the next 30 days and a quit date was established for 1%. Among smokers not yet ready to quit, few were counseled on the “5 R’s” (relevance, risks, rewards, roadblocks, repetition). These results expand our understanding of the unfortunately limited scope of cessation services delivered to persons seen in safety-net medical offices and call attention to the need to redouble efforts to more effectively address smoking cessation among diverse, low SES patients served by safety-net primary care clinics.

### Keywords

Smoking Cessation; social media/information technology; low SES; urban

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## INTRODUCTION

Smoking prevalence has declined over the past several decades, including a drop from 42% in 1965 to 19% in 2010 (Centers for Disease Control and Prevention, 2012). Despite these improvements, this behavior represents the single leading preventable cause of cancer and premature death in the United States (Center for Disease Control and Prevention, 2011). Nearly 450,000 premature deaths annually in the United States result from tobacco use and substantial numbers of persons continue to experience smoking attributable morbidity (US Department of Health and Human Services, 2010; American Cancer Society, 2013). Lung cancer ranked as the 2<sup>nd</sup> leading cause of premature mortality in 2010, accounting for nearly 3 million years of life lost and ranked as the 4<sup>th</sup> leading cause of disability-adjusted life-years (Fineberg, 2013). Tobacco use ranks as the 2<sup>nd</sup> leading risk factor for disability-adjusted life-years which is a summary measure of years of life lost and years lived with disability.

Unfortunately, inequities in smoking rates continue to exist. Smoking rates among Hispanics (12.9%) and Asians (9.9%) are lower than among African-Americans (19.4%), whites (20.6%) and American Indians/Alaska Natives (31.5%) and those reporting multiple races. An inverse pattern is noted between smoking patterns and education. Smoking rates among persons with a high school diploma (45.3%) are higher than among persons with associate (19.3%), bachelor (9.3%) and graduate degrees (5.0%). Moreover, smoking rates for those living below the poverty level are 29.0% compared to 17.9% for persons at or above the poverty level (Centers for Disease Control and Prevention, 2012).

Low socioeconomic status (SES) is linked with poorer health outcomes and disparities in smoking rates represent an important contributor to this continued inequity (Cokkinides, Halpern, Barbeau, Ward, & Thun, 2008). High rates of smoking in urban African American communities is a concern as this minority subgroup demonstrates a higher incidence of lung cancer compared to their white or Hispanic counterparts (Haiman et al., 2006; Slopen et al., 2012). In addition, Medicaid populations are more than twice as likely to report current

smoking than the general population (Murphy, Mahoney, Cummings, Hyland, & Lawvere, 2005).

Given the importance of understanding the real world implication of these disparities, this report describes the scope of tobacco cessation services delivered to low socio-economic status (SES) patients in several primary care medical offices, considered as ‘safety-net’ sources of health care, located within underserved urban areas of western New York State.

## **METHODS**

### **Study design**

The study employed a cross-sectional design. Institutional Review Board approval was obtained for this project.

### **Study Population**

Medical records for persons >18 years old were reviewed from 4 primary care medical offices. These offices were selected based upon their location in predominately medically underserved, African American communities of Buffalo, NY and Niagara Falls, NY. Agreements were in place with these offices to collaborate regarding ways to more effectively promote smoking cessation among their patients. African Americans comprise 39% of the 260,000 residents of Buffalo, which is one of the poorest cities in the United States. In Niagara Falls, where median household income is \$26,800, Africans Americans account for 26.1% of 50,200 residents (US Census, 2010).

### **Data Collection**

A standardized instrument was developed to facilitate the collection of specific data elements. Abstraction staff was trained in data collection procedures. Using a random starting point, every 5th chart was reviewed for at least 20% of the estimated smokers in each practice, up to a maximum of 300 charts. Patients must have visited the medical office at least one time in the prior 12 months and be identified as a smoker to be eligible for inclusion.

### **Independent variables**

The review collected information on patient demographics (gender, age, race/ethnicity), medical office, and number of visits in the past 12 months.

### **Dependent Variables**

The primary outcome variable in this study was the delivery of smoking cessation services as documented in medical records. We assessed adherence with recommendations from the Public Health Service guidelines for treating tobacco use and dependence (Fiore et al., 2009) including whether tobacco use status was recorded as a vital sign, whether tobacco use was assessed at the most recent office visit and the scope of cessation interventions delivered (i.e., advised to quit, assessed readiness to quit, assisted with quitting including setting a quit date, providing pharmacotherapy and counseling, and arranging for follow-up). For smokers

who were not yet ready to quit, charts were reviewed to assess whether relevance, risks, rewards, roadblocks and/or repetition was used as strategies to encourage smokers.

### Statistical Analysis

Patient characteristics and outcomes are reported as means, medians and standard deviations for continuous variables; and as frequencies and relative frequencies for categorical variables. Levels of adherence with recommendations for addressing smoking cessation (PHS 2008) were evaluated for the overall sample and within office. Significance was established at  $p < 0.05$  without adjustment for multiple testing. Analysis was completed using SPSS Version 21 (© IBM, Armonk, NY).

## RESULTS

### Demographic Characteristics

Medical charts were reviewed for 922 randomly selected patients from four community-based medical offices located in medically underserved communities. As shown in table 1, overall 59% were female, 54% were African American, and 7% were Hispanic. The distributions of these demographic variables varied by office ( $p < 0.001$ ). The vast majority of patients (94%) were current smokers. The number of office visits of the prior 12 months ranged from 1–9 visits; the mean was 3.44 (median=3).

### Smoking cessation services

Smoking status was assessed during the last office visit for 65% of smokers, however, only one of the four offices recorded smoking status as a vital sign (see table 2). One office reported having previously recorded smoking as a vital sign, however an update to the electronic medical record would no longer allow them to do it in its newest version. 59% of smokers were advised to quit and readiness to quit was assessed for 24%, although just 2% indicated a willingness to quit within the next 30 days. A quit date was established for 1% of smokers although 23% were offered pharmacotherapy, 21% were counseled in the office, 2% were referred for counseling and 15% were referred to the state smokers quit line. Follow-up visits to assess progress with cessation were rarely scheduled. Individual offices demonstrated variations in the delivery of smoking cessation support. African American smokers, females and persons over forty years of age were more likely to have smoking status assessed as a vital sign while white smokers and those over forty were more likely to be advised to quit.

The PHS guidelines endorse use of one or more of the “5 R’s” as a means to encourage smokers who are not yet ready to establish a quit date or are not interested in quitting. As presented in table 3, few smokers were motivated to quit through discussion of the “5 R’s”: the relevance of quitting (7%), the risks of continued smoking (13%), the rewards of quitting (3%), the roadblocks to quitting (3%) and repetition (3%). The total number of themes addressed during the prior 12 months ranged from 0–4; the mean was 0.21 (median=0). While offices did vary in approaching the 5 R’s with smokers unmotivated to quit, in general, their processes were suboptimal. Delivery of the 5 R’s did not vary by race, gender or age.

## DISCUSSION

Smoking cessation counseling, delivered as either a one-time service (\$1100/Quality Adjusted Life Year [QALY] saved) or repeated interventions (\$2000/QALY), has been demonstrated to be among the three most cost effective preventive services, together with childhood vaccines and aspirin use in high risk adults (Maciosek et al., 2006; Orleans, Woolf, Rothemich, Marks, & Isham, 2006). Considered from another perspective, the excess annual costs to employ a private sector smoker is estimated to exceed \$5,800 (range \$2,885–10,125) (Berman, Crane, Seiber, & Munur, 2013).

This paper documents the continued suboptimal management of nicotine addiction among smokers in a sample of low SES, urban, underserved primary care medical offices. A cross-sectional study, which involved the direct observation of nearly 2700 outpatient visits to 134 family physicians in 84 practices in northeastern Ohio during 1994–1995, reported that smoking cessation was discussed during 32% (154/477) of visits by smokers; by comparison exercise and diet were discussed at 23% (603/2670) and 21% (557/2670) of visits, respectively (Flocke & Stange, 2004). Another direct observation study conducted among 38 Family Medicine mostly non-urban medical offices in Kansas during 1999 reported the provision of smoking cessation assistance among 38% of smokers (92/244) despite the fact that these physicians reported relatively high levels of confidence in their smoking cessation skills suggesting that self-efficacy / knowledge is not a barrier (Ellerbeck, Ahluwalia, Jolicoeur, Gladden, & Mosier, 2001). Both observational studies noted that smoking cessation was more commonly addressed in offices using standardized approaches to identifying smokers and among patients seen for well visits (Ellerbeck et al., 2001; Flocke & Stange, 2004). Smoking cessation discussions in the Ohio study (Flocke & Stange, 2004) lasted a median of 0.7 minutes (range 0.3–8.7 minutes), which although comparable to the limited duration of discussion for diet and exercise, suggests that even when this conversation occurs, it is often brief and may not adequately address topics such as setting a quit date, prescribing pharmacotherapy, and providing counseling support. Moreover, the conversation may involve more “advice” than actual “assistance” (Orleans et al., 2006; Quinn et al., 2005).

Although physicians endorse the delivery of tobacco cessation, and are generally comfortable addressing this topic, the demands of medical practice often divert their attention (Stange et al., 1998). The use of a systematic approach to smoking cessation has been suggested to engage the patient on multiple levels and to focus the office on preventive care (Kruger, Troclair, Rosenthal, Babb, & Rodes, 2012). The PHS Guidelines for Treating Tobacco Use & Dependence (Fiore et al., 2009) and others (Maciosek et al., 2006; Orleans et al., 2006), suggest systems-based changes in office practice which should be facilitated by the evolution of patient centered medical homes. These changes include assessing smoking status as a vital sign, providing feedback to clinicians on actual performance along with incentives, office-based cessation specialists, better integration of existing technologies to support cessation (e.g., linkages to state quit lines) and health policy enhancements (e.g., increased tobacco taxes, standardization of pharmacotherapy coverage by health plans, clean indoor air laws and enhanced tobacco control funding) (Orleans et al., 2006). While time constraints in primary care scheduling are often cited as a barrier to the delivery of in-office

tobacco cessation (Jaen, Stange, & Nutting, 1994), interventions of three minutes have been shown to be effective (PHS) and many health plans and state quit lines now offer extended assistance for smokers who are committed to quitting. However, the rate-limiting step remains: the identification of tobacco users and an assessment of their level of interest in quitting.

A survey among adult members of nine health plans within the Cancer Research Consortium during 1999–2000, revealed that 90% of smokers reported being asked about tobacco use, 71% were advised to quit, willingness to quit was assessed for 56%, cessation assistance was provided to 49% and 9% were arranged follow-up (Quinn et al., 2005). It has been suggested that these selected health plans had demonstrated a strong commitment to preventive care including aggressive policies toward tobacco control and thus may not be reflective of the approaches utilized by other health plans. In contrast a recent report suggested declining rates of cessation advice by health care providers between 2005 and 2010, with females and persons >24 years old more likely to have received advice while Hispanics and uninsured smokers were less likely to get this advice (Kruger et al., 2012). In addition to potentially improving patients' health status, engaging patients in conversations about smoking cessation appears to enhance patient satisfaction with medical care (Barzilai, Goodwin, Zyzanski, & Stange, 2001; Kruger et al., 2012).

We are not aware of other papers that have reported on the delivery of the 5 R's in community based medical office settings. The Tobacco Use & Dependence Guidelines (Fiore et al., 2009) suggest discussing one or more of these topics (Relevance, Rewards, Risks, Roadblocks and Repetition) with smokers who are not currently interested in quitting as a means to express support and to personalize motivational messaging to encourage future behavior change. While results of our medical chart review suggest that few smokers are being engaged on these topics, it is possible that these conversations are underreported in the medical record. Offices are encouraged to revisit these topics and to involve non-physician providers in these discussions while making a greater effort to document the delivery of these messages.

Limitations of this project include reliance upon medical records and additional cessation support beyond that documented in the medical chart may have occurred. We did not collect information about the reason for the visit or the provider and many patients were seen by several different physicians during the 12 month observation interval. Also, there was no information on patient intentions/interest in quitting although we can infer it to be low since any patient-expressed interest in cessation would likely have been addressed and recorded. The inclusion of multiple visits during 12-month intervals may have overestimated the extent of services provided given repeated opportunities to address cessation across multiple visits. Strengths of this paper include a sizable sample of racially diverse, underserved smokers from multiple offices, reflective of patients seen in these medical offices.

When examining rates of smoking cessation advice, direct observation or taping of patient encounters is considered to be the most accurate compared to review of medical records, physician report or patient recall. However, while review of medical records is often the most pragmatic approach for assessment of this service, patient surveys may be more



accurate. Stange et al. (1998), in a comparison of level of agreement of medical records with direction observation reported that smoking cessation which was directly observed during the patient visit was recorded in 41% of medical charts, which ranks in the upper 1/3 of all counseling services in terms of sensitivity. For comparison, patient exit interviews confirmed the delivery of smoking cessation counseling 72% of the time.

As society moves forward to improve healthcare quality and outcomes and in the process reduce healthcare expenditures, reducing the negative healthcare impacts of smoking on society is paramount. This is especially true among African Americans and those with lower SES who are at a greater risk of poor health outcomes and lung cancer from smoking (Cokkinides et al., 2008; Haiman et al., 2006; Slopen et al., 2012). This study demonstrates a need for increased efforts to engage members of the healthcare system and members of the African American and low SES communities to improve smoking cessation in physician offices. This effort most likely will not be easy and will require an investment from all the stakeholders (payers, federal/state governments, provider practices and patients) to have a significant impact because primary care providers who treat predominately African Americans have been reported to have limited resources to provide top-notch quality care, to refer to high-quality specialist and for high-quality diagnostic imaging (Bach, Pham, Schrag, Tate, & Hargraves, 2004).

## CONCLUSION

These findings suggest the need to refocus on office-based approaches to smoking among low socioeconomic status patients seen in urban, “safety-net” primary care medical offices. Tactics would include the systematic identification of all smokers, assessment of interest in quitting and provision of cessation assistance, and motivational conversations by engaging all office staff (e.g., physicians, nurses and allied health professionals) to encourage a future quit attempt. The implementation of Patient Centered Medical Homes and making this a quality metric may help to provide additional resources for this effort.

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**Table 1**  
Selected Demographic and Smoking Status Variables Among Smokers, Overall and by Medical Office

Variables	Office Locations												p-value			
	Office A (n=188)			Office B (n=134)			Office C (n=300)			Office D (n=300)				Total (n=922)		
	n	%		n	%		n	%		n	%			n	%	
<b>Gender</b>	Male	62	33%	47	35%	117	39%	156	52%	382	41%		382	41%	<i>p=0.001</i>	
	Female	126	67%	87	65%	183	61%	144	48%	540	59%		540	59%		
<b>Race/Ethnicity</b>	White	22	11%	74	56%	59	32%	135	45%	290	38%		290	38%	<i>p=0.000</i>	
	African American	141	72%	42	32%	121	66%	103	34%	407	54%		407	54%		
	Other/Multi-Race	19	10%	17	13%	3	2%	25	10%	64	8%		64	8%		
	Hispanic	3	2%	26	21%	10	11%	7	3%	46	7%		46	7%		
<b>Hispanic Ethnicity</b>	Non-Hispanic	161	98%	101	79%	80	89%	237	97%	579	93%		579	93%	<i>p=0.000</i>	
	Current	179	95%	114	89%	290	97%	273	91%	856	94%		856	94%		
	Former	9	5%	14	11%	6	2%	27	9%	56	6%		56	6%		
<b>Last recorded smoking status</b>	Never	0	0%	0	0%	2	<1%	0	0%	2	<1%		2	<1%	<i>p=0.001</i>	
	Mean	3.64			3.94			2.80			3.38			3.44		
	Median	3.00			3.00			2.00			3.00			3.00		
<b># of office visits over prior 12 months</b>	Range	1-8			1-8			1-9			1-8			1-9		<i>p=0.001<sup>a</sup></i>

<sup>a</sup>Median test

**Table 2**  
 Delivery of smoking cessation services among smokers, overall and by medical office

Variables	Office Locations												p-value
	Office A (n=188)		Office B (n=134)		Office C (n=300)		Office D (n=300)		Total (n=922)				
	n	%	n	%	n	%	n	%	n	%			
Smoking last recorded as a vital sign?	Yes	187	100%	0	0%	0	0%	0	0%	187	20%	<i>p</i> <0.001	
	No	1	0.5%	131	100%	299	100%	300	100%	731	80%		
Smoking status assessed at last office visit?	Yes	148	79%	59	45%	201	67%	190	63%	598	65%	<i>p</i> =0.000	
	No	40	21%	72	55%	98	33%	110	37%	320	35%		
Was patient advised to quit?	Yes	83	46%	80	63%	187	64%	165	60%	515	59%	<i>p</i> =0.001	
	No	96	54%	47	37%	104	36%	108	40%	355	41%		
Was readiness to quit assessed?	Yes	58	32%	21	17%	102	35%	31	11%	212	24%	<i>p</i> <0.001	
	No	121	68%	106	83%	189	65%	242	89%	658	76%		
Is patient ready to quit in the next 30 days?	Yes	4	2%	5	4%	0	0%	5	2%	14	2%	<i>p</i> =0.021	
	No	175	98%	121	96%	291	100%	268	98%	855	95%		
Was quit date established?	Yes	3	2%	2	2%	0	0%	5	2%	10	1%	<i>p</i> =0.163	
	No	176	98%	124	98%	290	100%	268	98%	858	99%		
Was pharmacotherapy offered?	Yes	39	22%	25	21%	98	34%	39	14%	201	23%	<i>p</i> <0.001	
	No	140	78%	97	80%	193	64%	234	86%	664	77%		
Was patient counseled in office?	Yes	39	22%	24	19%	107	34%	13	5%	183	21%	<i>p</i> <0.001	
	No	140	78%	103	81%	184	63%	260	95%	687	79%		
Was patient referred for counseling	Yes	1	1%	0	0%	17	6%	0	0%	18	2%	<i>p</i> <0.001	
	No	178	99%	127	100%	274	94%	273	100%	852	98%		
Was patient referred to NYSSQL <sup>a</sup> ?	Yes	7	4%	63	50%	44	15%	16	6%	128	15%	<i>p</i> <0.001	
	No	172	96%	64	50%	247	85%	257	94%	723	85%		
Was cessation follow up scheduled?	Yes	0	0%	14	11%	2	1%	2	1%	18	2%	<i>p</i> <0.001	
	No	179	100%	112	89%	289	99%	271	99%	832	98%		
Was follow up with patient completed?	Yes	0	0%	4	3%	1	0.3%	2	1%	7	1%	<i>p</i> =0.012	
	No	178	100%	121	97%	290	100%	271	99%	841	99%		

<sup>a</sup>New York State Smokers Quit Line

**Table 3**

Delivering the 5 R's<sup>a</sup> to smokers, overall and by medical office.

Variables	Office Locations												p-value		
	Office A (n=188)			Office B (n=134)			Office C (n=300)			Office D (n=300)				Total (n=922)	
	n	%		n	%		n	%		n	%			n	%
If patient was ready to quit, was Relevance reviewed?	Yes	14	8%	10	9%	37	13%	0	0%	61	7%		61	7%	p=0.001
	No	161	92%	107	92%	254	87%	269	100%	77%	93%		77%	93%	
If patient was ready to quit, were Risks reviewed?	Yes	19	11%	18	15%	47	16%	24	9%	104	13%		104	13%	p=0.022
	No	156	89%	99	85%	244	84%	245	91%	730	88%		730	88%	
If patient was ready to quit, were Rewards reviewed?	Yes	4	2%	3	3%	13	5%	4	2%	24	3%		24	3%	p=0.224
	No	171	98%	114	97%	278	96%	265	98%	810	97%		810	97%	
If patient was ready to quit, were Roadblocks reviewed?	Yes	4	2%	3	3%	13	5%	4	2%	24	3%		24	3%	p=0.167
	No	171	98%	114	97%	278	96%	265	98%	810	97%		810	97%	
If patient was ready to quit, was Repetition employed?	Yes	4	2%	3	3%	13	5%	4	2%	24	3%		24	3%	p=0.266
	No	171	98%	114	97%	278	96%	265	98%	810	97%		810	97%	
5 R's <sup>a</sup>	Mean	0.21			0.25			0.33			0.08			0.21	
	Median	0			0			0			0			0	
	Range	0-3			0-4			0-3			0-2			0-4	

<sup>a</sup>Relevance, Risks, Rewards, Roadblocks, Repetition

<sup>b</sup>Median test