

Enhancing Routine HIV Testing in Primary Care With a Continuing Education Intervention

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abstract

Since 2006, the Centers for Disease Control and Prevention (CDC) has recommended routine HIV screening in primary care settings for people ages 13 to 64, regardless of individual risk factors. However, an extensive body of research has identified several barriers to primary care providers' (PCPs) adherence to the CDC recommendations. Employing a pre-postintervention design, this study provided an assessment of barriers among 11 PCPs and implemented an evidence-based continuing education program adapted to the specific individual barriers they identified. The study found that PCPs were initially providing HIV testing using risk-based criteria but that the continuing education program increased intentions to perform routine HIV testing (e.g., during annual wellness examinations and new patient visits). Results of the study inform individual quality improvement projects and legislative or policy actions to increase HIV screening in sites providing primary care. [*J Contin Educ Nurs*. 2018;49(12):563-574.]

Since the first cases of AIDS were identified in 1981, there have been three significant recent shifts in the management of the HIV epidemic. First, people living with HIV received expanded access to insurance coverage under the Patient Protection and Affordable Care Act (2010). Second, the Health Resources and Services Administration (HRSA) and the Centers for Disease Control and Prevention (CDC) have begun to coordinate HIV prevention and care services (CDC & HRSA, 2015). Finally, the CDC issued a recommendation in 2006 (Branson et al., 2006) that all adolescents and adults between the ages of 13 and 64 should be offered HIV screening as

a routine part of care; the recommendation was echoed in guidelines published in 2013 by the United States Preventive Services Task Force (USPSTF) (Branson et al., 2006; Chou et al., 2012; Moyer, 2013; USPSTF, 2013). These changes have placed increasing pressure on primary care providers (PCPs) to offer HIV screening and services, a move that creates both opportunities and challenges to meeting the call in the National HIV/AIDS Strategy for the provision of HIV services free of stigma and discrimination (Office of National AIDS Policy, 2010, 2015).

Ensuring that every person living with HIV is aware of his or her serostatus is the first step in the HIV prevention and care continua (i.e., the models that depict stages in prevention and medical care that people may go through following an HIV test, which include appropriate use of pre-exposure prophylaxis and viral load suppression) (U.S. Department of Health and Human Services, 2016). Public health experts have identified primary care sites as essential to achieving the eradication of HIV (Frieden, Foti, & Mermin, 2015; McNairy & El-Sadr, 2014; U.S. Department of Health and Human Services, 2016). However, research has identified numerous barriers among PCPs to the adoption of evidence-based guidelines, generally, and to the implementation of the CDC and USPSTF recommendations, more specifically, including misperceptions

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regarding the need for prescreen counseling and consent, time constraints, lack of familiarity with the guidelines, and stigma toward people living with HIV and individuals at risk for infection (Arya et al., 2014; Bokhour, Soloman, Knapp, Asch, & Gifford, 2009; Branson et al., 2006; Burke et al., 2007; Cabana et al., 1999; DeMarco, Gallagher, Bradley-Springer, Jones, & Visk, 2012; Goyal et al., 2013; Korhuis et al., 2011; Moyer, 2013; White et al., 2014; Wong et al., 2013; Zheng, Suneja, Chou, & Arya, 2014; Zielinski et al., 2015).

PROBLEM DESCRIPTION

Given these barriers, rates of routine HIV screening remain suboptimal, even among sites with HIV-specific expertise and funding. Recent estimates of the rates of routine screening in general primary care are around 40% (Brennan et al., 2013; Doll, Ward, Bettiker, & Samuel, 2013). A study of 324 HRSA-funded health centers that offered HIV screening found that only 20% provided routine screening according to CDC guidelines, with higher rates (43%) among individual sites receiving funding for HIV services from the CDC and/or the Ryan White HIV/AIDS Program (U.S. Department of Health and Human Services, 2013). Similarly, according to findings from a national survey of PCPs, 67% of providers who work in primary care settings and who provide HIV clinical care (HIV PCPs) perform routine HIV screening according to the CDC guidelines, versus 38% of PCPs who do not provide clinical HIV care (non-HIV PCPs) (HealthHIV, 2014). Even among the subset of HIV PCPs, individuals who lack credentials as an HIV specialist are less likely to screen routinely for HIV than those with such training (30% versus 57%, respectively) (HealthHIV, 2014). Although specific data on rates of routine testing in primary care are not available, New Jersey has included a goal for increasing the rates of HIV testing among adults ages 18 to 64 in its Healthy New Jersey 2020 health promotion plan (New Jersey Department of Health, 2018). Therefore, to significantly increase rates of HIV screening across the state, evidence-based interventions are needed to overcome PCPs' barriers to guideline adherence.

THEORETICAL FRAMEWORK

To date, there have been few interventions implemented to address the barriers and to enhance facilitators that PCPs cite regarding their uptake of evidence-based HIV prevention and care. Recent systematic reviews indicate an overall dearth of high-quality research on the topic and a particular lack of implementation of proven strategies within U.S. health care institutions (Restall & Gonzalez, 2014; Stangl, Lloyd, Brady, Holland, & Baral, 2013; Sengupta, Banks, Jonas, Miles, & Smith, 2011). A review of

the literature suggests the need to implement and evaluate interventions among health care providers to address these barriers.

The Theoretical Domains Framework (TDF) was developed within the field of implementation science as a way to help identify barriers and facilitators to uptake of evidence-based interventions among health care personnel (Atkins et al., 2017). The framework describes cognitive, affective, social, and environmental factors that influence the behaviors of health professionals and provide a structured set of steps to enhance behavioral change adapted to the needs of individual practitioners (Atkins et al., 2017). The TDF has been used successfully to develop interventions designed to change practice behaviors of PCPs and served as the guiding framework for this pilot study (Little, Presseau, & Eccles, 2015; Murphy et al., 2014; Thomas & Mackintosh, 2014).

PRIMARY AIMS

The two primary aims of this quality improvement (QI) study were to identify the barriers to routine HIV screening among participating PCPs and, by addressing these barriers through an evidence-based intervention, to increase PCPs' intention to offer guideline-based HIV screening. Given the dearth of information on current routine HIV testing practices among PCPs in New Jersey, no specific targets for increase were determined a priori. However, the National HIV/AIDS Strategy has set a goal of increasing the percentage of people living with HIV who are aware of their status to 90% (Office of National AIDS Policy, 2015); therefore, PCPs should strive to ensure that all patients ages 13 to 64 in their practice receive an HIV test at least once, regardless of their risk for infection, but more frequently for individuals at increased risk for infection. For this project, the primary outcome of interest was the report of a clinically meaningful increase in the percentage of patients offered an HIV test among participating PCPs. Additional outcomes assessed were reports of intentions to increase screening (a) during routine office visits (e.g., annual wellness visits and new patient visits) and (b) among all patients, regardless of perceived risk factors. Although no single definition exists of a *clinically meaningful effect*, for purposes of this study, the phrase was used to refer to an increase of at least 50% more than the baseline value for continuous variables and a two-category change for categorical variables (Keefe et al., 2013).

METHOD

During the preimplementation phase of the study, participants completed a standardized electronic questionnaire (**Table A**; available in the online version of this

article) that was created in Qualtrics® and sent to them via e-mail. A consent for participation was embedded in the electronic file and required approval before proceeding. The survey collected information on demographic and practice characteristics, knowledge and attitudes toward routine HIV screening, practices regarding HIV screening, and the barriers/facilitators to guideline adherence. Up to 3 months after exposure to the interventions, participants completed a follow-up survey to assess changes in practice and the persistence of barriers.

Setting and Participants

In line with the World Health Organization's definition of primary care, the study included New Jersey-based settings that serve as patients' first level of contact with health care teams (World Health Organization, 2008). Specifically, recruitment efforts targeted solo and group practices, federally qualified health centers, and local health departments that offer routine preventive and health care services to consumers ages 13 to 64, including sites that receive CDC and/or Ryan White HIV/AIDS Program funding. Invitations to participate in the study were sent via electronic distribution lists managed by the New Jersey Department of Health, an administrator of a large consortium of independent primary care practices located in Central New Jersey, the New Jersey Primary Care Association, and a professional association targeting New Jersey nurse practitioners. Given the variability in maintenance of distribution lists and the inability for the study team to track whether the e-mail was received or read, it was not possible to determine how many potentially eligible individuals received the invitation to participate.

Areas of specialization for participating providers included family-general practice, internal medicine, and obstetrics and gynecology. The study excluded sites providing only specialty care, including infectious disease specialists and other sites that serve only people living with HIV. The study population included medical doctors, doctors of osteopathic medicine, advanced practice nurses, and physician assistants providing health care services within the specified study settings. A total of 11 providers completed both phases of the study, although one respondent failed to complete the program evaluation questions in the follow-up survey.

Study Intervention

Development of the intervention followed the traditional analysis, design, development, implementation, and evaluation approach (Morrison, 2011). Analyzing the needs for individual learners involved conducting a thorough review of the published literature (including U.S.-based studies and research conducted in other countries

with similar recommendations) to catalog the barriers and facilitators that PCPs cite in offering routine HIV screening. The next step was to identify and design content to address the learner-specific barriers based on the TDF (i.e., via identification of evidence-based approaches to improving PCPs' adherence to guidelines generally and to HIV screening guidelines more specifically). The primary author (A.D.B.) developed the course content by mapping screening barriers to specific evidence-based interventions (e.g., didactic material to inform learners of the 2006 CDC guidelines and video testimonial regarding the ease of incorporating routine HIV testing into practice). The intervention was then implemented among the sample of PCPs. Finally, evaluating the results involved use of a pre-postintervention design (Almomen et al., 2016; Alperin & Uden-Holman, 2017). Two of the goals in the development process were to ensure that the training component of the intervention would not require more than 15 to 20 minutes of the clinician's time and that the content would be visually appealing so as to engage participants. As such, the development process included a pilot test of the intervention with one nurse practitioner prior to implementation in the entire sample.

Preintervention. From the 41 barriers identified during the literature review, participants were asked to indicate how significant each was as a reason that they do not always follow the CDC's recommendations on routine HIV screening (using a 4-point scale ranging from 0 = *not a reason* to 4 = *major reason*). Among those barriers rated as a 3 or 4, participants were then asked to rank them in order of magnitude. Intervention content was customized to each participant and focused on the three barriers that received the highest rankings. This type of cafeteria approach, where PCPs are exposed to evidence-based interventions on the basis of the context of their particular barriers and the settings in which they practice, has been shown to be effective in enhancing intervention effectiveness (Van Cleave et al., 2012). Participants also answered survey questions regarding personal and practice characteristics and their current practices in providing HIV screening (i.e., during which types of encounters they currently offer HIV testing and among which groups of patients). Preintervention activities were conducted in August and September 2016. Metrics from the Qualtrics survey indicated that participants took, on average, 18 minutes to complete the preintervention survey assessing their individual barriers.

Intervention. The intervention itself consisted of a dynamic PowerPoint® presentation with embedded links to resources and video content, which was sent to the participant via e-mail. To respect participants' time, the presentation was designed to be self-directed so they could view it at their leisure. The presentation consisted of three

sections: (a) background, (b) barriers, and (c) resources. The background and resources sections were the same for all participants, whereas the barriers section (as described later) was customized to the individual. The background section included:

- Didactic information on HIV prevalence in the participant's county of employment.
- Data on the HIV care continuum.
- Background on the 2006 CDC recommendations.
- Information on HIV-related stigma and how routine HIV testing can help to reduce stigma.
- Background on the Ryan White HIV/AIDS Program and the effects of the Affordable Care Act on access to HIV prevention and care services and insurance coverage for routine HIV testing.

The resources section included:

- Links to copies of the CDC recommendations.
- A list of referral sites to Ryan White providers for patients who test positive for HIV.
- Reporting forms for positive HIV tests.
- Billing codes for HIV testing.
- Patient and provider educational materials that participants could download and make available in their waiting rooms.

Given that screening rates and barriers to routine screening vary significantly by personal and practice characteristics (Berkenblit et al., 2012; Doll et al., 2013; Wong et al., 2013), the barriers portion of the intervention was targeted to the barriers cited by individual PCPs in the preimplementation phase. Specifically, each slide set was customized by the study's primary author (A.D.B.) on the basis of the three barriers that the participant rated as the top three reasons he or she does not perform routine screening. Interventions were mapped to TDF domains to ensure that the specific content included in the presentation addressed the underlying sociobehavioral constructs that inform the barriers. For example, behavior change techniques that address barriers related to behavioral regulation (i.e., attempts to manage or change objectively observed or measured actions) include developing patient-provider contracts, setting goals targeting specific behaviors or outcomes, or establishing prompts (e.g., development of computer-assisted decision-making systems, establishing goals for HIV screening that are tracked over time, or identifying acceptable protocols for HIV screening). The intervention was provided 2 months following completion of the baseline survey (i.e., between September and early November of 2016). Estimates indicated that participants spent around 15 minutes reviewing the PowerPoint materials.

Postintervention. Following the review of the course content, participants completed a follow-up survey that assessed the percentage of patients screened and intentions

regarding HIV screening going forward. The follow-up survey also asked providers to rate the extent to which the barriers they cited previously remained barriers to routine HIV testing going forward. The postintervention section of the survey also included questions to evaluate the activity, including how well it achieved the stated learning outcomes. Postintervention assessment occurred between late November 2016 and January 2017. Qualtrics metrics indicated that participants spent approximately 10 minutes, on average, completing the follow-up survey. Therefore, overall time spent on the activity averaged approximately 40 minutes.

Outcome Measures

The primary learning objectives for the study were integration of routine HIV testing into PCP workflow and implementation of routine testing when ordering regular blood tests during annual wellness visits and physicals. As such, the outcome measures of interest were self-reported increase in adherence to CDC recommendations on routine HIV screening and increased intentions to screen patients across encounter types (i.e., during annual physicals and acute care visits) and characteristics (e.g., ages 13 to 64 years). Given the lack of standardized tools to assess PCP adherence to HIV testing guidelines, these outcome measures were based on self-report and not on a previously validated and reliable instrument. However, a recent study by Doll et al. (2013) found that self-reported rates of HIV screening (47% among residents and 37% among attending physicians) were close to those identified using chart review (39%). Therefore, in the baseline survey, participants were asked, "[About] what percentage of your patients between the ages of 13 and 64 would you estimate you have screened for HIV in the past year?" At follow up, patients were asked to provide this estimate for the prior 2-month period.

The questions by visit type read "How often do you offer HIV screening to your patients in the following types of encounters: acute care outpatient visits, routine follow-up visits...?" Questions by patient characteristics read "How often do you offer HIV screening for the following groups of patients: patients aged 13 to 17...patients who have risk factors for HIV or who have engaged in high risk behaviors...?" Response categories were *never*, *some of the time*, *most of the time*, *all of the time*, and *not applicable*. At follow up, the stems of the questions read "Going forward, how often do you intend to offer HIV screening to your patients in the following types of encounters/for the following groups of patients?" using the same response categories as the baseline questionnaire. Due to the study's small sample size, for purposes of data analysis, the response categories were collapsed to *none*

some of the time and most/all of the time. Activity learning objectives included:

- The ability to cite the CDC recommendations for routine HIV testing.
- The ability to name at least one site to refer patients to for rapid HIV testing and/or specialty care.
- An increased sense of confidence in discussing HIV with patients.
- The ability to explain to patients the rationale for routine HIV testing.

All of these learning objectives were assessed in the follow-up period as part of the program's evaluation. Participants were asked to rate their agreement that the activity met these objectives on a scale from 1 (*completely disagree*) to 5 (*completely agree*).

Protection of Human Subjects and Ethical Considerations

Participants received up to 1 free hour of continuing education (CE) credit through the Center for Professional Development at Rutgers University's School of Nursing after completion of all study activities (i.e., baseline survey, QI interventions, follow-up survey, and project evaluation). The School of Nursing's Center for Research on HIV Management in Families and Communities provided the funding to pay for the continuing education credits. The Center provides seed money for pilot studies conducted by students and faculty members and had no further involvement in the study or vested interest in the study's outcomes. Because the study represented no more than a minimal risk to participants, Rutgers' institutional review board determined the study to be exempt from review.

Data Analysis

Data from the Qualtrics survey were uploaded into an Excel® file and then converted to a data file for analysis using SPSS® version 23. Descriptive statistics focused on the demographic and practice characteristics of study participants. Given the small number of participants, it was not possible to include these factors in any statistical analysis. Pre–postintervention analyses focused primarily on (a) the number of barriers cited by study participants, (b) the percentage of patients screened for HIV, and (c) patterns of routine screening by visit type and patient characteristics. Due to the small sample size, these analyses used the Wilcoxon signed-rank test (the nonparametric equivalent of the paired *t* test, for use with small samples or data that are otherwise not normally distributed) and chi-square tests (for categorical variables) to identify any significant changes in practice patterns or intentions over time.

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF
PROJECT PARTICIPANTS (N = 11)

Demographic Characteristic	n (%)
Gender	
Female	8 (72.7)
Male	3 (27.3)
Age (years; M = 44.6)	
Ethnicity	
Black/African American, non-Hispanic	2 (18.2)
Latino/Hispanic	2 (18.2)
White, non-Hispanic	7 (63.6)
Professional background	
Nurse practitioner/advanced practice nurse	5 (45.5)
Medical doctor or doctor of osteopathic medicine	6 (54.5)
Area of specialization	
Family medicine	5 (45.5)
Internal medicine	3 (27.3)
Pediatrics	2 (18.2)
Other	1 (9.1)
Years in practice (M = 13.6)	
Patients with HIV treated in past year	
0 to 5	11 (100)
Education on HIV in past 3 years ^a	
Academic course	3 (27.3)
Conference presentation	3 (27.3)
Continuing education course	5 (45.5)
Grand rounds	1 (9.1)
Journal article	1 (9.1)
Online webinar	1 (9.1)
Textbook	2 (18.2)
Discussion with an expert/colleague	4 (36.4)
None	3 (27.3)

^a Respondents were instructed to select all that apply; therefore, percentages total more than 100%.

FINDINGS

Participant Characteristics and Screening Barriers

Participant Demographics. Of the 11 participants, the majority were White (64%) and women (73%), with an average age of 44.6 years (Table 1). Participants were nearly evenly split between advanced practice nurses and physicians (46% and 54%, respectively), with the most common specialty of family medicine (46%), and had been practicing in their field for an average of 13.6 years.

TABLE 2
PRACTICE CHARACTERISTICS OF
PROJECT PARTICIPANTS (N = 11)^a

Practice Characteristics	n (%)
Type of HIV test available in practice	
Rapid HIV testing (oral swab or finger stick)	1 (9.1)
Serum HIV testing	9 (81.8)
Do not know	1 (9.1)
Estimated prevalence of HIV infection in practice	
Significantly below the national average	2 (18.2)
Somewhat below the national average	8 (72.7)
About at the national average	1 (9.1)
Somewhat above the national average	0 (0)
Significantly above the national average	0 (0)
Insurance of patients (mean %) ^b	
Private	– (57.3)
Medicare	– (23.8)
Medicaid	– (13)
Uninsured	– (5.9)
Ethnic distribution of patients (mean %) ^b	
Asian	– (11.3)
Black/African American, non-Hispanic	– (14.1)
Latino/Hispanic	– (24.1)
Native American/Alaskan Native	– (0.6)
Pacific Islander/Hawaiian Native	– (3.3)
White, non-Hispanic	– (46.6)

^a Unduplicated patients per year, n = 964 (mean number per year).

^b Primary care providers were asked to estimate only the percentage of patients per category. They did not report raw numbers, so some numbers are missing for this variable.

These providers have had little experience working with people living with HIV, with all of them reporting having seen fewer than five patients living with HIV in the past year. Nearly 80% of the participants have had some exposure to HIV-related training in the past 3 years, with a CE course being the most common forum (46%); however, three participants (27%) had not had any such exposure.

Practice Characteristics. Participating PCPs saw an average of 964 patients per year. Given that most primary care practices are not willing to pay the extra costs required to store and administer rapid HIV tests, the vast majority (82%) offer HIV testing only through serum blood tests (Table 2). All participants assessed the prevalence of HIV in the geographic area of their practice as at or below the national average. Most of the patients seen by participating providers have insurance coverage, with the majority

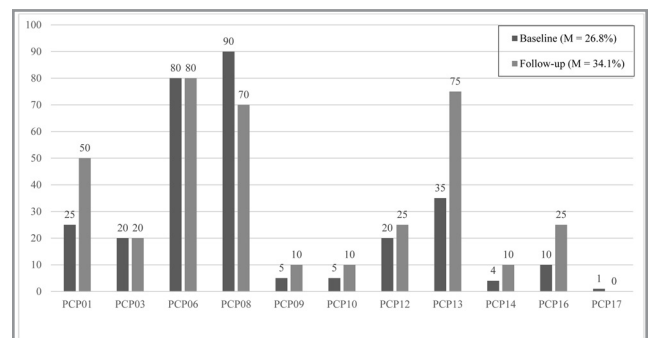


Figure 1. Pre–postintervention HIV screening practices.

(57% on average) covered by private plans and another 38% having public coverage (i.e., 24% Medicare and 13% Medicaid); only 6% of patients were not insured. In terms of patient demographics, providers see primarily non-Hispanic White and Latino/Hispanic patients (47% and 24%, respectively).

Barriers Endorsed and Interventions Provided. The baseline survey identified a broad range of barriers to routine HIV screening among participating providers. Of the 41 barriers identified from the literature, at least one PCP cited each of 35 barriers (information not presented, but available upon request). The most commonly cited (by seven participants each) were (a) patients do not want to be tested, (b) it is difficult to screen adolescents when they are accompanied by a parent/guardian, and (c) there is a risk of breaking confidentiality when billing for HIV screening. However, of the 35 barriers endorsed by at least one participant, only 18 were cited as one of the top three major barriers to HIV screening by at least one participant. For example, although the majority of participants stated that they did not provide HIV screening because they believe their patients do not want to be tested, this was cited as one of the top three barriers to screening by only one participant.

Pre–Postintervention Findings

Provider HIV Screening Practices. At baseline, participating PCPs reported screening an average of 27% of their eligible patients for HIV during the previous 12 months (Figure 1). The lowest rate of screening was 1%, whereas the highest was 90%. At follow up, providers reported how many of their patients they screened for HIV during the prior 2 months. Two providers reported no change in the percentage of patients screened, whereas two others reported decreases; all others indicated an increase. Overall, the mean percentage of patients screened increased from 27% to 34%. Although not statistically significant overall, based on a Wilcoxon rank sum Test ($p = .986$), the change was clinically meaningful for six of the 11 participants

given that they doubled the number of patients tested following exposure to the intervention.

HIV Screening by Encounter Type. In the baseline period, providers generally reported that they do not routinely offer HIV screening for a variety of encounter types (Table 3). The most common setting for HIV screening was annual physicals, with 36% of providers stating that they screen for HIV most or all of the time in these encounters; only one provider reported always screening patients during this encounter type. For all other types of encounters, the majority of participants reported that they do not regularly test patients, with between 46% and 91% stating that they *never* or *only sometimes* test patients in acute care visits, routine follow-up visits, or when a patient is hospitalized. In some cases, PCPs reported that these types of encounters were not applicable in their practices (e.g., several stated that they do not have hospital privileges and therefore do not track patients during hospitalizations and two indicated they would send patients with symptoms consistent with HIV to another site of care for testing).

In the follow-up survey, providers indicated, going forward, how often they plan to screen patients for HIV in the same encounter types in the future. Although none of the differences in pre-postintervention responses attained statistical significance using the chi-squared test statistic, intentions to offer screening increased across all types of encounters. The largest increase was in screening during annual physicals, with 82% of providers stating that they planned to screen for HIV *most/all of the time* during these visits (a 46 percentage point increase). Despite this large increase, the statistic did not attain significance because none of the providers said they never screen for HIV in annual physicals, so there were no participants moving two category ratings higher (i.e., from *never* to *at least most*—data not presented, but available upon request).

HIV Screening by Patient Characteristics. All of the participating providers perform some HIV screening, with all stating that they test for HIV based on age or presenting complaint at least some of the time (Table 3). However, based on their responses, PCPs were primarily engaging in risk-based HIV screening, with all providers stating that they would test for HIV most or all of the time if a patient (a) presented with risk factors, (b) requested an HIV test, and/or (c) showed signs or symptoms consistent with HIV. Among the age groups listed, PCPs were only somewhat regularly screening younger adults (i.e., those aged 18 to 44 years) at baseline (46% most or all of the time).

TABLE 3
PRACTICE ON HIV SCREENING: PRE-POSTINTERVENTION

Variable	Preintervention			Postintervention			Pre-Post Difference
	Never/ Some of the Time	Most/ All of the Time	Not Applicable	Never/ Some of the Time	Most/ All of the Time	Not Applicable	
Encounter type							
Acute outpatient visits	72.7	9.1	18.2	72.7	18.2	9.1	9.1
Routine follow-up visits	81.8	0	18.2	63.6	27.3	9.1	27.3
Patient is hospitalized	72.7	0	27.3	45.5	9.1	45.5	9.1
Annual physicals	45.5	36.4	18.2	9.1	81.8	9.1	45.4
New patient visits	90.9	0	9.1	72.7	27.3	0	27.3
Patient characteristic							
Aged 13 to 17 years	63.6	9.1	27.3	45.5	36.4	18.2	27.3*
Aged 18 to 44 years	45.5	45.5	9.1	18.2	72.7	9.1	27.2*
Aged 45 to 64 years	63.6	9.1	27.3	27.3	45.5	27.3	36.4*
With risk factors	0	81.8	18.2	9.1	90.9	0	9.1
Who requests an HIV test	0	81.8	18.2	0	100	0	18.2
With signs/symptoms of HIV	0	81.8	18.2	9.1	90.9	0	9.1

*Significant at $p < .05$.

TABLE 4
EVALUATION OF CONTINUING EDUCATION LEARNING OBJECTIVES

Having Completed This Activity, You...	Responses (n) ^a				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Are better able to cite the recommendations for routine HIV screening, as developed by the CDC	0	0	2	7	1
Are better able to patients the rationale for routine testing of all patients aged 13 to 64 years	0	0	1	8	1
Are better able to implement routine HIV testing when ordering regular blood tests during annual wellness visits/physicals	0	0	2	8	0
Are better able to identify at least one site to refer patients to for rapid HIV testing and/or specialty care	0	1	2	7	0
Are better able to integrate routine HIV testing in your practice workflow for regular preventive services	0	0	3	7	0
Feel confident in discussing HIV with patients	0	0	2	8	0

Note. CDC = Centers for Disease Control and Prevention.

^a Responses reflect the 10 participants who completed the evaluation portion of the follow-up survey.

In the follow-up period, only one provider (9%) said they would either never screen for HIV or screen only some of the time for patients with risk factors or signs or symptoms consistent with HIV infection; however, all said they would provide an HIV test to a patient who requested one. Given that participants were already performing risk-based HIV testing at high levels, the increases seen were not significant based on chi-square tests.

The intervention appeared to reinforce practices regarding screening young adults, with 73% of providers stating they would regularly screen patients in this age group (an increase of 27 percentage points). However, intentions to screen adolescents and older adults also increased following exposure to the intervention, with 36% of providers saying they planned to offer screening to adolescents, and 46% saying they would screen older adults (i.e., those aged 45 to 64 years) in the follow-up period. The increases in intentions to screen by age groups were significant at $p < .05$ based on chi-square analyses using a one-tailed Fisher's Exact Test (chi-square[1] = 3.301, $p = .046$ for adolescents; chi-square[1] = 3.983, $p = .031$ for young adults, and chi-square[1] = 6.5, $p = .004$ for older adults).

Evaluation of Learning Objectives

As noted previously, one participant failed to respond to the activity evaluation questions in the follow-up survey, the others largely endorsed that the activity met its stated objectives. The majority of the participants (seven or eight of the 11, depending on the question) either agreed or strongly agreed that the activity met each learning objective (Table 4). The other participants were mostly neutral on these objectives, al-

though one stated that he or she disagreed about being better informed on where to refer patients for HIV testing or care.

DISCUSSION

Summary

Despite the small sample size, this QI intervention was associated with clinically meaningful increases in routine HIV screening practices and intentions to conduct routine HIV screening. Six of the 11 respondents at least doubled the percent age of patients they screened for HIV between the pre- and postintervention phases. All but one of the providers was regularly engaged in risk-based HIV testing in the baseline period, with increases in intentions to increase testing across visit types and patient age groups. Importantly, the intervention was associated with significant increases in intentions to test across all ages, but particularly among older adults. Participants also gave favorable reviews of the activity, with the majority (approximately 73%) stating that the activity met its learning objectives.

Implications

Despite the CDC's recommendations (Branson et al., 2006), an analysis of trends in HIV screening between 2000 and 2011 showed conflicting results between two of the major public health surveys in the United States, with the National Health Interview Survey showing a significant increase in the percentage of adults aged 18 to 64 years who had ever received an HIV test (from 37% in 2000 to 45% in 2010) and the National Health and Nutrition Examination Survey showing no change (i.e., 43% in 2000 and 2010) (CDC, 2013). One explanation

offered for the failure to achieve universal screening was that the CDC recommendations were not able to provide any financial incentives or penalties for health care providers to implement a change in practice (Celada, Merchant, Waxman, & Sherwin, 2011).

In the preliminary analysis of the barriers that PCPs cited for not routinely screening patients for HIV, data from this project confirmed that concerns about costs are among the most prevalent. Specifically, three of the 11 respondents to the baseline survey cited a concern about the financial cost to patients if HIV testing is not covered by insurance as one of their primary reasons for not conducting routine screening. However, this concern reflects a misunderstanding of both the current economics of HIV testing and the system of care available to people living with HIV in New Jersey. HIV testing is covered by most public and private insurance providers, and for patients without insurance coverage, free testing is available through the health care safety net (Mugavero, Norton, & Saag, 2011).

HIV screening incurs little to no additional financial burden to providers given that HIV testing conducted within a practice can be added to laboratory work ordered for annual physicals, wellness visits, or routine follow-up appointments. In fact, based on the evidence reviewed by the USPSTF, routine HIV screening provides an economic benefit to the health care system because it helps to prevent costlier health care consumption by consumers who may be living with undiagnosed HIV infection (Moyer, 2013). The study findings suggest that through participation in this type of CE course, PCPs can obtain the knowledge and resources needed to implement routine screening (e.g., through increased awareness of the CDC recommendations, information on where to provide referrals for HIV care, and information on billing codes to obtain reimbursement for testing).

The increase in intentions to screen across age groups that was documented in this study is particularly critical for the youngest age groups because rates of new HIV infections have been highest and increasing in men who have sex with men, who are between the ages 13 and 24 years (CDC, 2018). Increasing rates of routine HIV testing across all primary sites of care will help to identify more young people who are infected. Perhaps more importantly, regular and routine testing may have the secondary effect of increasing awareness of the ongoing risks of HIV infection among a generation of people born after the height of the epidemic (in the 1980s) and after the advent of effective antiretroviral treatment in 1996.

The CDC's recommendations on routine HIV screening are not legally binding because states bear the responsibility for health regulation (DeMarco et al., 2012; Wolf,

Donoghoe, & Lane, 2007). However, evidence supporting the facility of implementing the CDC recommendations could be used to support stronger state laws to require routine screening, as was done in New York State in 2010 (Public Health Law § 2780). All of the participating providers use electronic medical records. The New York State law requires electronic medical records to include prompts to perform testing. New Jersey could implement similar requirements as a way to overcome barriers related to forgetting to perform HIV screening.

Under legislative approval (i.e., N.J.S.A. 45:11-26.1 and N.J.A.C. 13:37-5.3[j]), RNs in New Jersey who completed their training prior to 2008, or who received their degree since that time, but who did not receive specific instruction in organ donation and recovery, were required to complete 1 hour of CE credits on this topic prior to their next license renewal (New Jersey Board of Nursing, 2014). This project has already developed an educational intervention that provides CE credits for physicians, advanced practice nurses, and physician assistants. With policy makers' support, the project's intervention could be adapted and paired with a legislative initiative to encourage adoption of similar requirements for CE training on the topic of routine HIV screening. There are precedents for requiring greater education for PCPs through CE credits and implementation of HIV screening through legal oversight. New Jersey could adopt similar measures to help increase the rates of routine HIV screening in primary care practices. Given the preliminary evidence regarding the effectiveness of the study's intervention, the study's primary author (A.D.B.) is working with a consortium of HIV service providers, government officials, and people living with HIV to refine the tool as a CE module available to PCPs statewide.

Limitations

The most important limitation to this QI study was the small sample size, which limited the ability to discern statistically significant changes and excluded the possibility of generalizing the study's findings. Establishing the activity as a CE credited course provided some incentive to participate. In designing the study, significant effort was undertaken to minimize the time involved to no more than 1 hour. In addition, participants were able to view and complete the activity electronically, which was intended to improve the program's efficiency. However, it was necessary to e-mail the PowerPoint file to participants, so there were sometimes delays between the three phases of implementation. Efforts to revise and adapt the activity will include improved automation, so interventions are immediately mapped to the barriers cited and participants can complete the baseline and intervention phases of the

activity in one sitting. Future research will seek to test the intervention in a larger sample of PCPs, including evaluation of the activity's efficacy and validation of the study measures (e.g., requesting aggregate reports of screening behaviors from participants' electronic medical records).

CONCLUSION

Baseline data collection found that project participants were not routinely screening their patients for HIV and that there was wide variation from one PCP to another regarding reasons for failing to adhere to the CDC recommendations. These findings support the notion that interventions to improve rates of routine HIV screening need to be individualized to the barriers and needs of specific providers and that a one-size-fits-all approach is unlikely to be successful. The primary utility of this QI project was its approach to customizing content based on participants' needs for education and resources. Addressing the specific barriers that participants cited followed the theoretical approach to behavior change offered via the TDF and allows for greater efficiency in the delivery of content; participants do not have to wade through material that is irrelevant to them. Enhancing the program's content and delivery through greater automation will help to increase the sustainability of the activity by justifying minimal charges for participation.

The most significant recent discovery in HIV prevention is that consistent use of antiretrovirals (including pre-exposure prophylaxis for individuals who are HIV-negative but at risk for infection) can effectively eliminate the risk of HIV transmission or infection (CDC, 2017). Improving PCPs' adherence to routine HIV testing recommendations is critical to ending the epidemic because it can identify those who are unaware they are living with infection and who do not receive preventive and care services in sites that traditionally have performed the bulk of HIV testing. Encouraging more open discussions of HIV and including HIV testing in routine laboratory testing may also help to minimize the stigma associated with HIV infection. Although this QI project focused specifically on providers who are able to order HIV testing, the content could be expanded to target other health care providers who may be in a position to recommend HIV testing to consumers (e.g., chronic care case managers, health educators, and pharmacists). In this manner, the content could be adapted to any possible setting for primary preventive and medical care.

Next steps planned for this activity include efforts to encourage New Jersey legislators to require routine HIV testing and to mandate CE credits on routine testing as part of the state's existing requirements for cultural competency training. The primary author (A.D.B.) is applying for funding from the National Institutes of Health and lo-

cal foundations to enhance the technology for the course, as well as to conduct a more formal test of the activity's efficacy, including practice-specific reporting on rates and patterns of HIV testing using a pre-posttest, randomized control trial (i.e., the intervention versus informational brochures sent to primary care practices and sites of care).

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Table A
HIV Screening Questionnaire

Thank you for your interest in this study. Participating in this survey will help to improve routine HIV screening in your practice. We thank you again for your time and participation.

A. HIV Screening Practices

1. How often do you offer HIV screening to your patients in the following types of encounters?

(a) Acute care outpatient visits	Never	Some of the time	Most of the time	All of the time
(b) Routine follow-up visits	Never	Some of the time	Most of the time	All of the time
(c) When a patient is hospitalized	Never	Some of the time	Most of the time	All of the time
(d) Annual physicals	Never	Some of the time	Most of the time	All of the time
(e) Evaluation/consultation of a new patient	Never	Some of the time	Most of the time	All of the time

2. How often do you offer HIV screening for the following groups of patients?

(a) Patients aged 13 to 17	Never	Some of the time	Most of the time	All of the time
(b) Patients aged 18 to 44	Never	Some of the time	Most of the time	All of the time
(c) Patients aged 45 to 64	Never	Some of the time	Most of the time	All of the time
(d) Patients who have risk factors for HIV or who have engaged in high risk behaviors	Never	Some of the time	Most of the time	All of the time
(e) Patients who request an HIV test	Never	Some of the time	Most of the time	All of the time
(f) Patients with signs or symptoms suggestive of a sexually transmitted infection	Never	Some of the time	Most of the time	All of the time
(g) Patients in whom there is a clinical suspicion of HIV or AIDS	Never	Some of the time	Most of the time	All of the time

3. The Centers for Disease Control and Prevention (CDC) recommends HIV screening for all patients aged 13 to 64. There are many reasons why primary care providers may not follow these recommendations. Please indicate to what extent the following are reasons you may not conduct HIV screening according to the CDC guidelines.

	Not a reason			Major reason
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(a) Lack of awareness of the CDC recommendation.	0	1	2	3	4
(b) It is not the responsibility of primary care providers to conduct HIV screening.	0	1	2	3	4
(c) There is inadequate reimbursement for HIV screening.	0	1	2	3	4
(d) Pre-test counseling significantly lengthens the time required to screen for HIV.	0	1	2	3	4
(e) Lack of access to point-of-care testing (i.e., a rapid test) for HIV.	0	1	2	3	4
(f) Inadequate staffing resources for HIV screening.	0	1	2	3	4
(g) Discomfort in screening for HIV due to religious, spiritual, or cultural beliefs.	0	1	2	3	4
(h) Discomfort discussing HIV risk behaviors with patients.	0	1	2	3	4
(i) Patients do not want to be tested for HIV.	0	1	2	3	4
(j) Suggesting HIV testing might damage the patient-provider relationship.	0	1	2	3	4
(k) Inadequate training in how to discuss HIV with patients.	0	1	2	3	4
(l) Discomfort discussing a positive test result with a patient.	0	1	2	3	4
(m) Uncertainty about the legal obligations for reporting a positive test result.	0	1	2	3	4
(n) Financial costs to patients if testing is not covered by insurance.	0	1	2	3	4
(o) Current practice on HIV screening is adequate.	0	1	2	3	4
(p) Inadequate systems to ensure patient confidentiality for HIV screening.	0	1	2	3	4
(q) Disagreement with the CDC recommendations.	0	1	2	3	4
(r) Disagree with using guidelines to make clinical decisions.	0	1	2	3	4
(s) HIV screening is not included in practice performance measures.	0	1	2	3	4
(t) Lack of support for HIV screening among practice administration.	0	1	2	3	4
(u) Lack of appropriate educational materials for patients to make an informed decision about HIV testing.	0	1	2	3	4
(v) New Jersey state policies are inconsistent with recommendations on HIV screening.	0	1	2	3	4
(w) Lack of referral sources if a patient tested positive for HIV.	0	1	2	3	4
(x) It takes time to develop trust with a patient to be able to bring up the topic of HIV testing.	0	1	2	3	4
(y) Low prevalence of HIV in the local service area.	0	1	2	3	4
(z) HIV screening is not relevant to the reason for the patient visit.	0	1	2	3	4
(aa) There are more important preventive screening screens to emphasize during patient encounters.	0	1	2	3	4
(bb) Professional societies do not support HIV screening.	0	1	2	3	4
(cc) It should be the patient's responsibility to request an HIV test.	0	1	2	3	4

(dd) Patients are not at risk for HIV.	0	1	2	3	4
(ee) HIV screening should be limited to those with risk factors for infection.	0	1	2	3	4
(ff) Risk of false positive test results.	0	1	2	3	4
(gg) It takes too long for the test results to come back.	0	1	2	3	4
(hh) Forgetting to screen for HIV.	0	1	2	3	4
(ii) Concern about the possibility of being infected with HIV by a patient.	0	1	2	3	4
(jj) Patients who test positive for HIV might be subject to stigma or discrimination.	0	1	2	3	4
(kk) Too busy to do HIV screening.	0	1	2	3	4
(ll) Lack of standardized practice protocol for HIV screening.	0	1	2	3	4
Only providers who serve adolescent patients (ages 13 to 17):					
(mm) It is difficult to discretely screen adolescents for HIV when they are accompanied by their parents or guardians.	0	1	2	3	4
(nn) Risk of breaking patient confidentiality when billing for HIV screening.	0	1	2	3	4
(oo) Consent from a parent/guardian should be obtained prior to screening for HIV in an adolescent.	0	1	2	3	4
All providers					
(pp) Other reason (please specify):	0	1	2	3	4

4. Of all the items marked “3” or “4,” which are the most important reasons you do not screen all patients aged 13 to 64 for HIV?

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____

B. Practice Characteristics

5. For calendar year 2015, estimate the total number of unduplicated patients for whom you provided care: _____ patients
6. Approximately what percentage of your patients between the ages of 13 and 64 would you estimate have been screened for HIV in the past year (where “screening” is defined as either an offer of an HIV test or documentation of an HIV test result)? _____%
7. Which HIV testing method is available in your primary care practice? (Check all that apply.)
 - _____ My practice does not offer HIV testing
 - _____ Rapid HIV testing (oral swab or finger stick)
 - _____ Serum HIV testing
 - _____ I do not know which tests are available
 - _____ Other (please specify) _____

8. I estimate the prevalence of HIV infection in the population my clinic serves is:
- Significantly below the national average
 - Somewhat below the national average
 - About at the national average
 - Somewhat above the national average
 - Significantly above the national average
9. In the fields below, please estimate the insurance status breakdown of your patients (must equal 100%):
- | | |
|-------------|----------------------|
| % Private | <input type="text"/> |
| % Medicare | <input type="text"/> |
| % Medicaid | <input type="text"/> |
| % Uninsured | <input type="text"/> |
| Total | 100% |
10. In the fields below, please estimate the ethnic distribution of your patients (must equal 100%):
- | | |
|--------------------------------------|----------------------|
| White, non-Hispanic | <input type="text"/> |
| Black/African American, non-Hispanic | <input type="text"/> |
| Latino/Hispanic | <input type="text"/> |
| Native American/Alaskan Native | <input type="text"/> |
| Asian | <input type="text"/> |
| Pacific Islander/Hawaiian Native | <input type="text"/> |
| Other | <input type="text"/> |
| Total | 100% |

C. Demographic Questions

11. I am a:
- Nurse Practitioner/Advanced Practice Nurse
 - Physician's Assistant
 - MD or DO
12. How many years have you been in practice? [<1, 1, 2, 3, ... , 20, >20]
13. In the past 12 months, how many patients known to be living with HIV infection have you treated?
- 0-5
 - 5-10
 - 10-15
 - 15-20
 - >20

14. Please indicate any HIV-related training/education you have received in the past three years (check all that apply):

- Academic course
- Conference presentation
- Continuing education course
- Grand rounds
- Journal article
- Online webinar
- Textbook
- Through discussion with an expert or other colleague
- Other (please specify): _____
- None

15. Check the one box that best describes your current clinical specialty:

- Family medicine
- Geriatrics
- Internal medicine
- Obstetrics/Gynecology
- Pediatrics
- Other (specify) _____

16. What is your gender?

- Female
- Male
- Transgender Male
- Transgender Female

17. In what year were you born? [YYYY]

18. What is your race/ethnicity? (Check all that apply)

- Asian
- Black/African American, non-Hispanic
- Latino/Hispanic
- Native American/Alaskan Native
- Pacific Islander/Hawaiian Native
- White, non-Hispanic
- Other (specify) _____

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