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HIV pre-exposure prophylaxis champion preceptorship training for pharmacists and nurses in the United States

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Abstract

Introduction: Relatively little has been published on human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) training efforts and outcomes among clinicians working at community health centers and safety net clinical settings.

Objectives: This study describes the National Clinician Consultation Center's (NCCC's) PrEP training content development and learning outcomes.

Methods: The training consisted of a multidisciplinary capacity-building program designed to increase PrEP-related clinical knowledge and skills among pharmacy and nursing professionals at community health centers in "Ending the HIV Epidemic" priority jurisdictions. Descriptive statistics were used to report on the results of this training.

Results: Two groups of learners completed the hybrid training program in 2022 (total, $N = 50$). A comparison of pretraining and posttraining evaluations indicated that, collectively, learners' self-rated knowledge increased across all assessment domains including PrEP eligibility, disparities, laboratory monitoring, medication options and pharmacotherapy decision-making, and delivery of person-centered care. Learners rated the experience favorably, particularly for large group case discussion sessions. Among the 15 learners who completed the 6-month follow-up survey, many indicated an increase in PrEP services as well as additional training of colleagues and clinic staff.

Conclusion: The NCCC's uniquely developed PrEP capacity-building program is a highly acceptable and valuable training program that can help increase PrEP-related clinical knowledge and skills among pharmacy and nursing professionals at community health centers across the United States.

Keywords

education; HIV prevention; nurse; pharmacist; pre-exposure prophylaxis; training

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

1 | INTRODUCTION

In 2012, human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) was approved by the United States Food and Drug Administration; however, with over a decade of availability, PrEP prescribing practices, uptake, and persistence were low despite multiple opportunities along the PrEP care continuum. Numerous studies have linked a health care professional's PrEP prescribing abilities with the amount of education or training that they have received.[2–5] However, the development, implementation, and evaluation of PrEP training programs for clinicians in practice is still largely a work in progress. Additionally, the availability of new PrEP options (i.e., long-acting injectables) may introduce new questions and hesitancies that ought to be considered as PrEP training programs and curricula are developed.

A study in 2022 included interviews with 31 prescribing clinicians in the northeast United States and reported that barriers to PrEP readiness were low PrEP knowledge, limited time for visits, and competing clinical priorities. Another study in the Southeast United States found that primary care providers who received HIV-related training were more likely to prescribe PrEP compared with those who had no training. One report found that pharmacy students had greater PrEP knowledge, awareness, and familiarity with PrEP prescribing guidelines compared with medical students. However, medical students were more comfortable than pharmacy students in performing PrEP-related clinical activities and were more willing to refer a patient to another clinician. Finally, another report focusing on pharmacy students found that confidence in PrEP counseling translated to greater PrEP knowledge, awareness, and familiarity with prescribing guidelines.

One main challenge with implementing PrEP training programs for practicing clinicians is the limited amount of research on relevant topics, training formats, or modalities used for the training. One study among pharmacy students reported that online education, educational seminars, and self-study modules were the preferred format and modality for receiving PrEP education. Preferred educational topics were side effects and medication adherence monitoring. Another set of interviews with HIV and substance use clinicians emphasized gaps in training regarding HIV-related stigma, HIV prevention and treatment, and referral resources. In this study, regarding training format, clinicians cited didactic workshops and ongoing supervision as appealing strategies for increased PrEP prescribing practices. A separate study of 359 US providers found that those who were further along the PrEP care continuum (i.e., awareness, willingness, consultation, and prescription) recommended more comprehensive content (e.g., sexual and gender minority competence training) and interactive training formats compared with those who were not as far.

While pharmacist- and nursing-based PrEP care models are not new,[8–11] the underutilization of PrEP demands the expansion of these models to create new service efficiencies and collaborations, increase the diversity of the PrEP workforce, improve PrEP access, and facilitate scale-up, especially in resource-limited communities. Additionally, relatively little is known about the long-term impact of specific PrEP training programs on future PrEP counseling and prescribing practices. To help address these gaps and to highlight the importance of multi-professional training/education to facilitate collaboration and expand

PrEP access, the National Clinician Consultation Center (NCCC) developed PrEP champion preceptorship training focusing on pharmacists and nurses.

Since its inception in 1991, NCCC (nccc.ucsf.edu) has been the first and longest-running national teleconsultation service in the United States. It is housed within the University of California, San Francisco's Department of Family and Community Medicine and is federally funded to provide multiple teleconsultation services for US-based clinicians including the HIV Warmline, Perinatal HIV Hotline, PrEPline, Postexposure Prophylaxis Hotline (PEPline), Substance Use Warmline, and Hepatitis C Warmline. As a capacity-building organization, the NCCC's mission is to promote health equity in the United States by helping every health care professional feel supported and confident in their decision-making through evidenced-informed, person-centered clinical consultation and education. The NCCC provides these services using clinical subject matter experts through a model of direct clinician-to-clinician telephone- and web-based consultations and education that is free of charge and individualized to each provider and case/query. This paper describes the elements of the NCCC PrEP champion preceptorship training and evaluates the training's impact on the learners' PrEP prescribing practices.

2 | METHODS

In 2021, supplemental "Ending the HIV Epidemic-Primary Care HIV Prevention (PCHP)" funding was made available to help expand access to HIV prevention services in federally qualified health centers (FQHCs). In response to this opportunity, the NCCC developed a novel PrEP champion preceptorship to increase pharmacists and advanced practice registered nurses/registered nurses (henceforth referred to as "nurses") comfort and clinical capacity concerning PrEP delivery. The NCCC's PCHP project team (NCCC's Program Manager, a public health nurse/clinical nurse specialist with HIV prevention expertise, three HIV/PrEP-experienced clinical pharmacists, and two HIV-experienced primary care physicians) conducted an initial needs assessment in September 2021. This involved a review of multiple information sources to identify potential training content including the existing scientific literature/evidence base, National PrEPline calls (with particular attention to pharmacist-initiated consultation requests), and other publicly available PrEP clinical training and capacity-building materials. The project team also gathered information on clinician- and clinic-level challenges specifically related to PrEP implementation using PrEPline calls. The team initially planned to focus on pharmacist learners; however, nursing professional learners were also included given that not all FQHCs had pharmacists and because the training content developed was potentially beneficial to all clinicians involved in PrEP services. This work was deemed exempt by the University of California, San Francisco Institutional Review Board.

The project team then developed a multimodal preceptorship, which included online learning modules followed by two half-day live virtual workshops. This hybrid learning format was selected to allow for the complementary integration of a self-paced, online portion (18 modules developed using Articulate 360 (Articulate, New York, NY), an e-learning solution to create interactive online and mobile courses) followed by a "virtual

classroom" environment where learners could hear from each other as well as preceptorship faculty.

The online modules consisted of multidisciplinary faculty-curated clinical content for learners interested in initiating or improving their PrEP prescribing practices (Table 1). Multiple formats were used for the online trainings including lecture videos, presentation slides, job aids (tables, figures, summaries), audio recordings, and knowledge check questions. Learners completed the online training independently and then participated with others in a larger group format of two 4-h, "live" virtual classroom sessions which were conducted on Zoom (Zoom Video Communications, San Jose, CA), a Health Insurance Portability and Accountability Act (HIPAA)-compliant video-conferencing platform. The classroom sessions used case-based group discussions and interactive discussions of PrEP implementation in practice to reinforce and build upon the clinical knowledge/skills application introduced in the online modules. Postpreceptorship "office hours" were offered to learners to discuss unique challenges that were not addressed during the preceptorship. A total of 10.5 h of continuing education was available for learners who completed all 18 modules and participated in both four-hour workshop sessions. Participation in the training was limited to 302 clinical sites in 28 states that received the Primary Care HIV Prevention award from the Health Resources and Services Administration (HRSA) in fiscal years 2020 and 2021. The training was promoted through emails to each of the eligible clinical sites and through the NCCC's funder's newsletter that reaches over 1400 health care centers nationwide.

Learners completed pretests and posttests to evaluate their knowledge and comfort level with PrEP care content areas, knowledge of resources to implement a successful PrEP program, and knowledge and skills to train other clinicians. The posttest was conducted shortly after the completion of the training. Two additional evaluations, one for nurses and one for pharmacists, were required for learners to claim continuing education credits. This evaluation assessed the learners' satisfaction with the training, the preceptorship's impact on their educational needs and ability to train other colleagues, and the NCCC project team's knowledge and performance. Finally, 6 months posttraining, a follow-up survey examined clinic capacity and changes since the completion of the training.

3 | RESULTS

This analysis describes results from the first two cohorts of learners. The first cohort, attending in May 2022, included 24 learners (including 17 pharmacists, 4 advanced practice registered nurses, 2 registered nurses, and 1 physician assistant) from clinics in California, Florida, Louisiana, Massachusetts, Oklahoma, Pennsylvania, Texas, Washington, and Puerto Rico. For the second cohort in November 2022, the 26 learners included 16 pharmacists, 4 advanced practice registered nurses, and 6 registered nurses from sites in Alabama, Arizona, California, Florida, Indiana, Louisiana, Massachusetts, Maryland, Missouri, North Carolina, Ohio, South Carolina, and Texas.

Table 2 compares the pretraining and posttraining self-evaluation among learners of the two cohorts combined. Across all questions, there was an increase in overall PrEP knowledge

related to various aspects of PrEP clinical assessment, prescribing, monitoring, follow-up, or capacity to implement PrEP services. Pretraining, a mean of 45.3% and 25.3% of respondents ($n = 48$) rated themselves to have “no to less-than-medium” and “medium” levels of knowledge related to PrEP clinical practice, respectively. These means decreased to 2.2% and 9.5%, respectively, posttraining ($n = 43$). Conversely, a mean of 28.2% of respondents stated that they had a “more-than-medium to high” level of knowledge pretraining, which increased to a mean of 88% posttraining.

Satisfaction with NCCC’s PrEP champion preceptorship program was high among pharmacists ($n = 27$) and nurses ($n = 16$). Nearly all the pharmacists stated that the training met their educational or professional needs to some degree and that it positively influenced their teaching and/or clinical practice (Table A1). The vast majority (93%) agreed that the training would positively impact the clinical skills and performance of their health care team. The clinical case discussions were the most helpful component of the training program, followed by presentation slides from the online modules.

Similarly, all the nurses rated the impact of the educational activity on their profession as good to excellent (Table A2). They found nearly all components of the preceptorship as very to extremely helpful. Approximately 94% stated that learning together with other health care professionals would help them become more effective members of their health care team.

A total of 15 from 50 learners (30%) responded to the 6-month follow-up survey (Table 3). There was a 13% increase in the number of clinics offering PrEP services, and 53% of respondents noted that they had an overall increase in the number of clients on PrEP at their respective clinics. Learners had also trained 72 other health care professionals in their clinics.

4 | DISCUSSION

This paper describes the project development and preliminary 1-year results of the first pharmacist- and nurse-focused PrEP capacity-building training program prepared and conducted by the NCCC, an educational resource of the acquired immunodeficiency syndrome (AIDS) Education and Training Centers. NCCC’s experience operating the National PrEPline (launched in Fall 2014) has provided its team with special insights into “real world” questions and evolving learning/educational gaps of clinicians across diverse practice settings and communities in the United States Additionally, the NCCC’s long-standing practice of integrating clinical pharmacists and nurses into its core team of multidisciplinary consultants has allowed the organization to develop this preceptorship as a unique “peer-to-peer” learning and capacity-building experience.

NCCC cultivated the preceptorship’s training to cover a comprehensive array of key clinical and patient care topics identified by the project team as being essential to the delivery of effective, appropriate, and person-centered PrEP services. The training methodology incorporated principles of adult learning by combining numerous short online e-modules (incorporating various multimedia components) along with two live half-day virtual workshops of facilitated case discussion and in-depth conversation about PrEP

implementation. Overall results from these two preceptorship cohorts were highly favorable, with the vast majority of learners indicating increases in PrEP-related knowledge, skills, and capacity after completing the program. Learners expressed a high degree of satisfaction with multiple elements of the training program and indicated that certain components (e.g., group case discussions and slides used by faculty in the prerecorded video modules) were especially helpful. Furthermore, the 6-month posttraining survey results suggest that this is a highly efficient model for expanding PrEP workforce capacity, with nearly five additional clinicians trained for each preceptorship learner as well as an increase in learners' clinic PrEP services.

Experiences and findings from NCCC's PrEP champion preceptorship provide valuable perspectives for current and future HIV-related training and clinical capacity-building efforts. First, to improve the delivery of comprehensive, accessible HIV prevention, and treatment services, it is imperative to use multidisciplinary approaches. Given pharmacists' in-depth knowledge of medications, side effects, drug interactions, and availability, they are an integral part of PrEP care delivery systems and as such, recognized by the Centers for Disease Control and Prevention (CDC) to assist in ending the HIV epidemic. Currently, 17 states have approved legislation to expand pharmacists' scope of practice to allow independent prescribing and dispensing of PrEP medications. Promoting capacity-building for pharmacists and nurses can create new HIV prevention champions to augment PrEP access and appropriate medication management. The NCCC's blended training/capacity-building model has been well received and underscores an ongoing, high demand for clinically focused training/education devoted to PrEP.

Few studies have sought to describe the experiences and preferences of health professionals, especially pharmacists and nurses, about PrEP training and skills building. One study evaluated PrEP training and confidence among 228 trainees at a large, urban southern academic medical center. Trainees, which included physician residents and fellows, completed an online survey about adolescent sexual health services, including items focused on PrEP. Nearly 44% of trainees reported being "not confident at all" in prescribing PrEP, which was associated with not having been taught how to prescribe PrEP. About 22% were also "not confident at all" in prescribing PrEP confidentially. One study, an intervention to address HIV clinicians' attitudes and counseling practices, used a combination of short lectures, interactive discussions, topical exercises, and dyadic roleplays. The authors reported that clinicians' attitudes, comfort, self-efficacy, and frequency of delivering prevention counseling improved. In another study evaluating a 7-month intervention including role-playing, case stories, discussion to support health care teams in improving HIV prevention activities, and skill-building exercises, clinicians' attitudes toward conducting HIV risk assessment and prevention counseling were improved after the intervention. Trainees were less likely to express frustration with challenging cases and reported more confidence in sexual history taking, improved skills in assessing readiness for change, and increased support in their clinical setting. Finally, another study that combined fictional client personas, role-play exercises, and focused on providing information on PrEP effectiveness, prescribing practices, and service delivery, demonstrated increased PrEP knowledge and self-efficacy among Baltimore HIV clinicians. Similarly, the

evaluation of our training showed improvements in learners' knowledge, comfort, skills, and capacity to provide PrEP, as well as scalability of PrEP provision posttraining.

Our findings have some notable limitations. We collected and reported self-reported data and have no objective outcomes such as number of PrEP prescriptions. Therefore, our results are subject to social desirability bias. Additionally, we had missing data among learners for the 6-month follow-up surveys. Given that the completion of the 6-month survey was not required for receipt of continuing medical education credit, there may have been a reduction in the number of learners completing this survey. Through evaluations of two completed trainings, we have identified some areas for potential future expansions. Some of these areas were content development for Spanish-speaking populations, as well as content for PrEP navigators and nonprescribing coordinators. Additionally, based on the positive feedback we received, some modifications for future iterations include increasing the time for case discussions during the live workshop sessions. As future funding is identified for this training, we continue to iteratively refine its content and format as we offer it on a biyearly basis.

It is important to note that our training is applicable for any member of the health care team (not only pharmacists and nurses). However, given the importance of the role of pharmacists and nurses in the multidisciplinary team, we developed this training to further advocate for, and specifically emphasize, the critical role of nonphysician clinicians in the delivery of PrEP care. Our experience with this training affirms that pharmacists and nurses play vital roles in enhancing PrEP service efficiencies and collaborations and can also help increase the PrEP workforce. This, in turn, can improve PrEP access and scale-up particularly in resource-limited settings. Although many important conversations are occurring about how to increase PrEP access, autonomy, and affordability, many patients seek support and guidance from health care professionals when it comes to medication options and clinical monitoring. Thus, increasing clinicians' PrEP knowledge and self-efficacy can help improve PrEP services, access, and equity—all important drivers in bringing the United States closer to ending the HIV epidemic.

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APPENDIX

TABLE A1 Satisfaction of pharmacists with the PrEP champion preceptorship (total $n = 27$).

Question	Response options	n (%)
To what degree did this module meet your educational or professional needs?	Not at all—a little	0 (0.0)
	A moderate amount	3 (11.1)
	A lot-a great deal	24 (88.9)
To what degree did this module relate directly to your teaching or clinical practice?	Not at all—a little	1 (3.7)
	A moderate amount	2 (7.4)
	A lot-a great deal	24 (88.9)
To what degree did this module describe indications, strategies, and laboratory testing associated with the provision and monitoring of different PrEP regimens/schedules	Not at all—a little	1 (3.7)
	A moderate amount	3 (11.1)
	A lot-a great deal	23 (85.2)
To what degree did this module describe the role of the clinical pharmacist and other PrEP team members in identifying, promoting, and retaining eligible PrEP recipients[a]	Not at all—a little	0 (0.0)
	A moderate amount	3 (11.5)
	A lot-a great deal	24 (88.5)
To what degree did this module examine the facilitators and barriers to PrEP use and populations experiencing disparities in access to HIV prevention	Not at all—a little	0 (0)
	A moderate amount	4 (14.8)
	A lot-a great deal	23 (85.2)
This activity improved my knowledge of the subject	Strongly—somewhat disagree	0 (0.0)
	Neither agree nor disagree	1 (3.7)
	Somewhat-strongly agree	26 (96.3)
This activity enhanced my ability to make a change in practice	Strongly—somewhat disagree	0 (0.0)
	Neither agree nor disagree	1 (3.7)
	Somewhat-strongly agree	26 (96.3)
This activity will change the way I practice	Strongly—somewhat disagree	0 (0.0)
	Neither agree nor disagree	1 (3.7)
	Somewhat-strongly agree	26 (96.3)
This activity will have a positive effect on the outcomes of my patients	Strongly—somewhat disagree	0 (0.0)
	Neither agree nor disagree	1 (3.7)
	Somewhat-strongly agree	26 (96.3)
This activity will have a positive effect on the teaching of my students/trainees	Strongly—somewhat disagree	0 (0.0)
	Neither agree nor disagree	1 (3.7)
	Somewhat-Strongly agree	26 (96.3)
Indicate all that applies…[b]	This activity will positively impact the clinical skills and performance of my health care team	25 (92.6)
	Learning with other health care professionals increased my ability to understand the clinical information discussed	21 (77.8)
	Learning with other health care professionals was done in a way that will help me become a more effective member of my health care team	20 (74.1)
	Shared learning at this activity helped me understand the role of other health care professionals	20 (74.1)

Question	Response options	*n* (%)
	This learning experience increased my teamwork skills	18 (66.7)
	This learning experience increased my ability to communicate effectively with other clinicians	16 (59.3)
How helpful were the following components of the training?		
Didactic orientation[a]	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	5 (18.5)
	Very-extremely helpful	21 (77.8)
	N/A	1 (3.7)
Videos	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	7 (25.9)
	Very-extremely helpful	20 (74.1)
Reading material	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	8 (29.6)
	Very-extremely helpful	19 (70.4)
Presentation slides	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	3 (11.1)
	Very-extremely helpful	22 (81.5)
	N/A	2 (7.4)
Clinical case discussions	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	2 (7.4)
	Very-extremely helpful	25 (92.6)

Abbreviation: N/A, not applicable; PrEP, pre-exposure prophylaxis.

[a] $n = 26$.

[b] Multiple responses allowed.

TABLE A2 Satisfaction of nurses with the PrEP champion preceptorship ($n = 16$).

Questions	Response	*n* (%)
Rate the impact of this educational activity on your profession	Poor—fair	0 (0.0)
	Good	1 (6.3)
	Very good-excellent	15 (93.8)
Assess how well this activity globally met your educational needs	Poor—fair	0 (0.0)
	Good	3 (18.8)
	Very good-excellent	13 (81.3)
Rate the following aspects of this educational activity:		
Overall quality of activity[a]	Poor—fair	0 (0.0)
	Good	1 (6.3)
	Very good-excellent	14 (87.5)
	Not applicable	1 (6.3)
Selection of topics[a]	Poor—fair	0 (0.0)
	Good	0 (0.0)
	Very good-excellent	15 (93.8)

Questions	Response	*n* (%)
	Not applicable	1 (6.3)
Activity organization[a]	Poor—fair	0 (0.0)
	Good	1 (6.3)
	Very good-excellent	14 (87.5)
	Not applicable	1 (6.3)
Relevance to practice	Poor—fair	0 (0.0)
	Good	1 (6.3)
	Very good-excellent	14 (87.5)
	Not applicable	1 (63)
Educational content[b]	Poor—fair	0 (0.0)
	Good	1 (6.3)
	Very good-excellent	13 (81.3)
	Not applicable	1 (6.3)
How helpful were the following components of the training?		
Didactic orientation	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	1 (6.3)
	Very-extremely helpful	15 (93.8)
Videos	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	0 (0.0)
	Very-extremely helpful	16 (100.0)
Reading material	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	0 (0.0)
	Very-extremely helpful	16 (100.0)
Presentation slides	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	0 (0.0)
	Very-extremely helpful	16 (100.0)
Clinical case discussion	Not very helpful—a little helpful	0 (0.0)
	Somewhat helpful	1 (6.3)
	Very-extremely helpful	15 (93.8)
Indicate all that applies[c]	Learning with other healthcare professionals was done in a way that will help me become a more effective member of my healthcare team	15 (93.8)
	This activity will positively impact the clinical skills and performance of my healthcare team	14 (87.5)
	Learning with other healthcare professionals increased my ability to understand the clinical information discussed	14 (87.5)
	Shared learning at this activity helped me understand the role of other healthcare professionals	14 (87.5)
	This learning experience increased my ability to communicate effectively with other	11 (68.8)
	This learning experience increased my teamwork skills	10 (62.5)

Abbreviation: PrEP, pre-exposure prophylaxis.

[a] $n = 16$.

[b] $n = 15$.

[c] Multiple responses allowed.

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TABLE 1

Title, learning outcomes, and learning activities of each module.

Module	Learning outcome	Learning activities
Course introduction	Introduction and navigation instructions	• Preceptorship introduction video • How to navigate this course • Disclosure statement
Epidemiology and PrEP basics		
HIV epidemiology and PrEP efficacy	• Examine US HIV epidemiology, PrEP use patterns, and health disparities • List prescriber/prescribing-related challenges that limit PrEP access • Define the purpose of PrEP and its relative efficacy in preventing HIV transmission	• Slides and video: HIV Epidemiology and PrEP Coverage: Trends and Inequities • Slides and video: clinician-perceived barriers to prescribing PrEP • Slides and video: PrEP purpose and efficacy • Job aid slides: multidisciplinary PrEP teams • Knowledge check
PrEP assessment (before initiation)		
Using nonstigmatizing language	• Recognize how stigma and bias impact clinician's PrEP counseling and information sharing • Demonstrate nonstigmatizing communication techniques and approaches clinicians can use when sharing information about PrEP	• Slides and video: using nonstigmatizing language to talk about sex, PrEP, and health • Audio recordings: people discussing PrEP stigma • Language prompts: language to use and not to use when discussing PrEP • Slides and video: respecting the whole individual and changing the narrative from a risk-based to a health- and safety-based discussion • Slides and video: changing the narrative • Knowledge check
PrEP indications, workup, and regimen options	• Describe the process for evaluating a person for PrEP candidacy • Demonstrate approaches to engage in shared decisionmaking with patients considering PrEP • Discuss the baseline medical workup of a person starting PrEP • Compare and contrast available PrEP options concerning indications, contraindications, dosing, and potential drug–drug interactions	• Slides and video: who should be on PrEP? • Slides and video: initiating PrEP conversations, medical workups, and PrEP regimen options • Job aid slides: comparing TDF/FTC, TAF/FTC, and long-acting injectable CAB • Slides and video: interpretation of HBV serologies • Job aid slide: HBV serology interpretation • Knowledge check
"PrEP-ception"	• Describe current recommendations for PrEP use in pregnant and breast/chest-feeding persons • Explain how PrEP can be incorporated to facilitate conception in sero-different partnerships	• Slides and video: periconceptional and perinatal PrEP considerations • Job aid slides: PrEP-ception • Knowledge check
Adherence and time to efficacy	• Demonstrate the ability to convey the importance of PrEP adherence and time to efficacy to patients • Demonstrate the use of evidence-based medication adherence assessments and counseling messages to support PrEP adherence • Describe basic information related to HIV drug resistance as it pertains to PrEP use	• Slides and video: the importance of PrEP adherence • Knowledge check
Nonoccupational PEP (nPEP) to PrEP and same-day PrEP	• Summarize key steps of offering same-day PrEP initiation • Demonstrate how to share information on transitioning from nPEP to PrEP with interested/eligible patients	• Slides and video: nPEP to PrEP • Job aid slides: nPEP to PEP switch • Slides and video: same-day PrEP • Knowledge check
Disclosures	• Review steps to avoid inadvertent disclosures about PrEP use or interest	• Slides and video: PrEP and confidentiality • Slides and video: PrEP, adolescents, and confidentiality

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Module	Learning outcome	Learning activities
		• Job aid slides: confidentiality and disclosure • Knowledge check
Patient assistance programs or insurance	• Name alternative medication access options/resources when insurance does not cover PrEP medications • Describe additional PrEP care-related services/costs that may not be covered by medication access programs	• Slides and video: PrEP patient assistance programs • Job aid slides: PrEP patient assistance program and PrEP financing strategies • Knowledge check
PrEP initiation		
HIV testing algorithm	• Distinguish between the various CDC-recommended HIV testing algorithms for PrEP initiation, reinitiation, or continuation • Explain the clinical rationale behind differing HIV testing algorithms according to PrEP use and recency	• Slides and video: HIV assessment before and during PrEP • Job aids slides: determining HIV status with recent ART exposure, or recent or ongoing ART exposure • Knowledge check
Daily versus 2–1–1 versus LAI	• Distinguish clinical and patient-specific scenarios where daily oral PrEP versus event-driven oral PrEP versus injectable PrEP might be preferred or indicated • Demonstrate approaches to engage in shared decisionmaking with patients for PrEP medication and dosing selection	• Slides and video: choosing PrEP regimens • Job aids slides: PrEP regimen choice and clinical considerations • Knowledge check
PrEP monitoring		
Lab tests at follow-up visits	• Summarize recommended laboratory tests and testing intervals for persons receiving oral PrEP or injectable PrEP	• Slides and video: adverse events and monitoring labs • Knowledge check
Labs indicating adverse events, switch, or discontinuation	• Identify common laboratory abnormalities seen in persons taking PrEP and thresholds for PrEP regimen switch or discontinuation	• Slides and video: different labs and indications for switch or discontinuation • Knowledge check
Ambiguous HIV test results	• Interpret HIV testing results for persons on PrEP and describe appropriate next steps (including follow-up laboratory testing, medication management, and possible clinical consultation) for persons with “ambiguous” HIV test results	• Slides and video: ambiguous HIV test results and available resources • Knowledge check
PrEP discontinuation		
Discontinuation plan and counseling messages for the prevention of HIV transmission	• Describe how to counsel individuals who acquire HIV while on PrEP regarding their health and wellness • Describe how to counsel individuals who acquire HIV while on PrEP regarding how to reduce the risk of HIV transmission to others • Describe how to counsel persons discontinuing PrEP on risk reduction and options for reinitiating PrEP in the future • Describe indicated laboratory testing after PrEP discontinuation • List options for PrEP “tail coverage” in persons discontinuing LAI CAB	• Slides and video: discontinuation plan • Knowledge check
Other important PrEP-adjacent topics		
Self-swabbing	• Describe recommended STI screening practices for persons on PrEP, including which tests to order and testing frequency • Demonstrate how to counsel patients on correct, sitespecific self-swabbing techniques to screen for bacterial STIs	• Slides and video: sexually transmitted infections and PrEP • Job aid slides: STI resources • Knowledge check
Other risk reduction practices	• Demonstrate effective counseling on other HIV risk reduction practices including “U = U,” safer injecting, and safer sex	• Slides and video: sexual risk reduction • Slides and video: injection drug use risk reduction • Job aid slides: risk reduction resources • Knowledge check
Nonprimary care clinical PrEP settings	• Describe nonprimary care settings where PrEP can be offered safely, including tele-PrEP, community/retail pharmacies, urgent care settings, and reproductive health clinics	• Slides and video: alternative PrEP delivery methods from telehealth to retail pharmacies • Knowledge check

Module	Learning outcome	Learning activities
Implementation challenges and solutions: pharmacists increasing HIV PrEP uptake	• Examine specific challenges to PrEP initiation and continuation • Discuss new research and approaches related to PrEP service delivery, pharmacy-based interventions, and tools for evaluating PrEP initiation and persistence • List specific strategies to increase and improve PrEP services	• Slides and video: pharmacists increasing HIV PrEP uptake

Abbreviations: ART, antiretroviral therapy; CAB, cabotegravir; CDC, Centers for Disease Control and Prevention; FTC, emtricitabine; HIV, human immunodeficiency virus; LAI, long-acting injectable; PrEP, pre-exposure prophylaxis; PEP, post-exposure prophylaxis; PrEP-ception, use of PrEP during conception; STI, sexually transmitted infection; TAF, tenofovir alafenamide; TDF, tenofovir disoproxil fumarate; U = U, undetectable equals untransmittable.

TABLE 2

Pretraining and posttraining self-evaluation among all learners in two cohorts combined.

Questions	***n*, pretraining (%) (total *n* = 48)**	***n*, posttraining (total *n* = 43)**
Currently, I rank my knowledge of the following as:		
Clinical assessment of PrEP candidacy	*a*	*b*
No—less-than-medium knowledge	22 (46.8)	0 (0)
Medium knowledge	10 (21.3)	6 (14.3)
More-than-medium—high knowledge	15 (31.9)	36 (85.7)
Up-to-date HIV transmission data/risks	*a*	*b*
No—less-than-medium knowledge	18 (38.3)	1 (2.4)
Medium knowledge	16 (34.0)	4 (9.5)
More-than-medium—high knowledge	13 (27.7)	37 (88.1)
Disparities in HIV risk and PrEP prescribing (e.g., impact of racism, transphobia, and homophobia)		*b*
No—less-than-medium knowledge	14 (29.2)	0 (0)
Medium knowledge	14 (29.2)	2 (7.1)
More-than-medium—high knowledge	20 (41.7)	39 (92.9)
Clinical assessment and use of PEP for HIV exposures prior to PrEP initiation		
No—less-than-medium knowledge	23 (47.9)	0 (0)
Medium knowledge	10 (20.8)	8 (18.6)
More-than-medium—high knowledge	15 (31.3)	35 (81.4)
PrEP baseline and monitoring labs, including screening for bacterial STIs		
No—less-than-medium knowledge	19 (39.6)	1 (2.3)
Medium knowledge	11 (22.9)	4 (9.3)
More-than-medium—high knowledge	18 (37.5)	38 (88.4)
Indications for PrEP regimen options (oral and injectable)		
No—less-than-medium knowledge	19 (39.6)	0 (0)
Medium knowledge	14 (29.2)	3 (7.0)
More-than-medium—high knowledge	14 (29.2)	40 (93.0)
Not applicable	1 (2.1)	0 (0)
Adverse effects of oral/injectable PrEP		
No—less-than-medium knowledge	19 (39.6)	0 (0)
Medium knowledge	16 (33.3)	4 (9.3)

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Questions	*n*, pretraining (%) (total *n* = 48)	*n*, posttraining (total *n* = 43)
More-than-medium—high knowledge	12 (25.0)	39 (90.7)
Not applicable	1 (2.1)	0 (0)
Risks versus benefits of HIV PrEP		
No—less-than-medium knowledge	15 (31.3)	0 (0)
Medium knowledge	15 (31.3)	3 (7.0)
More-than-medium—high knowledge	17 (35.4)	40 (93.0)
Not applicable	1 (2.1)	0 (0)
Federal (i.e., CDC) guidelines on PrEP evaluation and management		
No—less-than-medium knowledge	22 (45.8)	1 (2.3)
Medium knowledge	15 (31.3)	2 (4.7)
More-than-medium—high knowledge	11 (22.9)	40 (93.0)
Same-day PrEP starts	*c*	*b*
No—less-than-medium knowledge	22 (48.9)	1 (2.4)
Medium knowledge	13 (28.9)	4 (9.5)
More-than-medium—high knowledge	10 (22.2)	37 (88.1)
2–1–1 or “on demand” PrEP		
No—less-than-medium knowledge	29 (60.4)	0 (0)
Medium knowledge	9 (18.8)	4 (9.3)
More-than-medium—high knowledge	9 (18.8)	39 (90.7)
Not applicable	1 (2.1)	0 (0)
Providing “Tele-PrEP” care		
No—less-than-medium knowledge	26 (54.2)	4 (9.3)
Medium knowledge	12 (25.0)	5 (11.6)
More-than-medium—high knowledge	9 (18.8)	33 (76.67)
Not applicable	1 (2.1)	1 (2.3)
PrEP during conception, pregnancy, and breast/chest-feeding		
No—less-than-medium knowledge	33 (68.8)	1 (2.3)
Medium knowledge	7 (14.6)	3 (7.0)
More-than-medium—high knowledge	7 (14.6)	39 (90.7)
Not applicable	1 (2.1)	0 (0)
Clinical resources including PrEP patient assistance programs		

Questions	*n*, pretraining (%) (total *n* = 48)	*n*, posttraining (total *n* = 43)
No—less-than-medium knowledge	24 (50.0)	1 (2.3)
Medium knowledge	11 (22.9)	3 (7.0)
More-than-medium—high knowledge	12 (25.0)	39 (90.7)
Not applicable	1 (2.1)	0 (0)
Person-first/nonstigmatizing language		
No—less-than-medium knowledge	19 (39.6)	0 (0)
Medium knowledge	11 (22.9)	4 (9.3)
More-than-medium—high knowledge	17 (35.4)	38 (88.4)
Not applicable	1 (2.1)	1 (2.3)
PrEP in the setting of sero-different couples or “U = U”		
No—less-than-medium knowledge	25 (52.1)	0 (0)
Medium knowledge	9 (18.8)	4 (9.3)
More-than-medium—high knowledge	13 (27.1)	39 (90.7)
Not applicable	1 (2.1)	0 (0)
Verbally obtaining information essential for PrEP starts in a culturally sensitive manner		
No—less-than-medium knowledge	20 (41.7)	1 (2.3)
Medium knowledge	11 (22.9)	4 (9.3)
More-than-medium—high knowledge	16 (33.3)	38 (88.4)
Not applicable	1 (2.1)	0 (0)
Providing patient counseling about PrEP and HIV prevention in a culturally sensitive manner	*a*	*b*
No—less-than-medium knowledge	18 (38.3)	1 (2.4)
Medium knowledge	13 (27.7)	4 (9.5)
More-than-medium—high knowledge	15 (31.9)	36 (85.7)
Not applicable	1 (2.1)	1 (2.4)
Currently, I rank my capacity to implement a PrEP program in my clinic as:		
Know what resources are needed to implement a successful PrEP program	*a*	
No—less-than-medium knowledge	20 (42.6)	3 (7.0)
Medium knowledge	13 (27.7)	4 (9.3)
More-than-medium—high knowledge	14 (29.8)	36 (83.7)
Have the skill and knowledge to train other clinicians to provide PrEP	*a*	
No—less-than-medium knowledge	20 (42.6)	4 (9.3)

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Questions	*n*, pretraining (%) (total *n* = 48)	*n*, posttraining (total *n* = 43)
Medium knowledge	11 (23.4)	5 (11.6)
More-than-medium—high knowledge	12 (25.5)	34 (79.1)

Abbreviations: CDC, Centers for Disease Control and Prevention; HIV, human immunodeficiency virus; HBV, hepatitis B virus; PrEP, pre-exposure prophylaxis; PEP, post-exposure prophylaxis; STIs, sexually transmitted infections; U = U, undetectable equals untransmittable.

[a] *n* = 47.

[b] *n* = 42.

[c] *n* = 45.

TABLE 3

Follow-up learner survey to assess clinic capacity 6 months after the completion of the PrEP champion preceptorship (n = 15).

Questions	Response	*N* (%)
Before you started the PrEP champion preceptorship, was your clinic offering PrEP services?	Yes	12 (80.0)
	No	3 (20.0)
Six months after the PrEP champion preceptorship, is your clinic offering PrEP services?	Yes	14 (93.3)
	No	1 (6.7)
How has the volume of clients on PrEP services changed?	Increase	8 (53.3)
	Decreased	1 (6.7)
	No change	5 (33.3)
	No response	1 (6.7)
Approximately what % has it increased? Mean increase (SD)		19.0% (14.9)
Since your completion of the PrEP champion preceptorship, how many ____ were you able to train?[a]	Physicians	24 (33.3%)
	APRNs	23 (31.9%)
	Pharmacists	13 (18.1%)
	RNs	8 (11.1%)
	Pas	2 (2.8%)
	Other (MAs, PrEP navigators, HIV educators)	2 (2.8%)

Abbreviations: APRN, advanced practice registered nurse; HIV, human immunodeficiency virus; MA, medical assistant; PA, physician assistant; PrEP, pre-exposure prophylaxis; RN, registered nurse.

[a]Total = 72 (multiple responses allowed).