

Health Care Provider Perspectives on Pre-exposure Prophylaxis: A Qualitative Study

Sarahmona Przybyla, PhD, MPH* • Susan LaValley, PhD • Noelle St. Vil, PhD

Abstract

Although pre-exposure prophylaxis (PrEP) requires a prescription from a health care provider, we lack unanimity in guidelines for the identification of the ideal provider type to prescribe PrEP. The purpose of our study was to understand clinician perspectives on provider categories to determine who is best suited to prescribe this medication to HIV-uninfected patients. We conducted 28 in-depth interviews between September 2017 and January 2018 with current prescribers of PrEP. Qualitative findings indicated that providers were split on recommended PrEP prescriber type. Five themes emerged that centered on the explicit identification of the issue of opportunity for providers to educate their patients on PrEP and offer this medication to at-risk populations. To effectively maximize presentation for care and subsequently amplify uptake of PrEP, growing the base of providers who offer PrEP to eligible patients can provide a meaningful public health impact on reducing HIV incidence.

Key words: health care providers, HIV prevention, pre-exposure prophylaxis, qualitative research

Although HIV incidence in the United States has decreased by almost 20% in the past decade, an estimated 40,000 new cases occur annually (Centers for Disease Control Prevention, 2018). Pre-exposure prophylaxis (PrEP) is a biomedical instrument that has been added to the HIV prevention toolbox; PrEP involves antiretroviral medications (300 mg of tenofovir disoproxil fumarate and 200 mg of emtricitabine as Truvada®) taken by HIV-uninfected individuals to decrease the risk of acquiring HIV. The U.S. Food and Drug Administration (FDA) approved PrEP for adults in July 2012 (U.S. Department of Health and Human Services, 2012) and adolescents in May 2018 (Gilead Sciences Inc., 2018). Although more than 1 million Americans meet clinical eligibility guidelines for PrEP, fewer than 15% have received a prescription (Smith, Van Handel, & Grey, 2018b).

Although there has been growing interest in understanding PrEP knowledge, access, uptake, and adherence from a patient perspective, there have also been ongoing discussions about provider engagement and active involvement as gatekeepers to PrEP. When Truvada® received the initial approval of the FDA,

many providers applauded the addition of PrEP as a biomedical opportunity for HIV prevention; however, others expressed concern about its roll-out in real-world settings (Silapaswan, Krakower, & Mayer, 2016). Among important concerns regarding safety, efficacy, and cost, decision-making discussions by researchers and practitioners turned to the topic of appropriate provider type, revolving around the primary question: *Who is best suited to prescribe PrEP to patients at risk of HIV infection?* (Hoffman et al., 2016; Krakower, Ware, Mitty, Maloney, & Mayer, 2014). This debate has been coined "purview paradox," putting a spotlight on the notion that although HIV specialists may be most willing and able to prescribe PrEP, they do not typically provide care to HIV-uninfected patients, whereas generalists are more likely to see eligible PrEP patients but may lack sufficient training and skills to prescribe PrEP (Hoffman et al., 2016; Krakower et al., 2014).

Within months of approval by the FDA, many HIV experts became strong advocates for primary care providers (PCPs) familiarizing themselves with PrEP because widespread dissemination of such a pivotal HIV prevention tool could be best served in primary care offices, provided PCP care is given for at-risk patients who might meet the eligibility criteria (Krakower & Mayer, 2012). On the other hand, others suggested that infectious disease (ID) specialists were better suited to handle PrEP, given their experience prescribing antiretroviral therapy, their connection with patients living with HIV who had serodiscordant partners, and their skill in behavioral risk assessment (Turner, Roepke, Wardell, & Teitelman, 2018; Zablotska & O'Connor,

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

Sarahmona Przybyla, PhD, MPH, is an Assistant Professor, School of Public Health and Health Professions, University at Buffalo, Buffalo, New York, USA. Susan LaValley, PhD, is a Research Assistant Professor, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, New York, USA. Noelle St. Vil, PhD, is an Assistant Professor, School of Social Work, University at Buffalo, Buffalo, New York, USA.

*Corresponding author: Sarahmona Przybyla, e-mail: mona@buffalo.edu

Copyright © 2019 Association of Nurses in AIDS Care

<http://dx.doi.org/10.1097/JNC.000000000000073>

2017). Although there is support for the notion that PrEP be largely provided by HIV specialists, one study found that two thirds of PrEP prescriptions were written, in fact, by five specialties: internal medicine, family practice, ID, nurse practitioners, and physician assistants (Flash et al., 2014). Other studies pointed to the integration of PrEP into specialty care, such as women's health and gynecologic care (Pollock & Levison, 2018; Seidman, Carlson, Weber, Witt, & Kelly, 2016; Seidman & Weber, 2016), as well as adolescent medicine (Allen, Gordon, Krakower, & Hsu, 2017; Blackwell, 2018; Hart-Cooper, Allen, Irwin, & Scott, 2018; Mullins, Zimet, Lally, & Kahn, 2016), rather than maintained exclusively by HIV or ID specialists.

It is important to note that clinician willingness to engage in PrEP-specific prescribing activities has been growing. A recent survey found that 76% of PCPs and 85% of HIV providers were willing to prescribe PrEP after gaining appropriate knowledge and skills (Petroll et al., 2017). However, although many individuals at risk of HIV infection receive health care services in a primary care setting, only a small proportion of PrEP has been prescribed by PCPs. A recent national survey found that only 7% of PCPs have ever reported prescribing PrEP (Smith, Mendoza, Stryker, & Rose, 2016). In the context of public health, there is a concern for social utility. Although public health researchers and practitioners push for the importance of PCPs as the first-line prescribers of PrEP, others assert the need for specialized management of PrEP in specific categories of qualified health care providers. A commonly voiced claim in the PrEP provider debate has involved specialists being perceived by PCPs as experts in HIV medicine and in the prescription of antiretroviral medications and, therefore, being a logical referral path for PCPs to send PrEP candidates (Krakower et al., 2014; Patel et al., 2018). In addition, ID specialists have more experience engaging and retaining patients with HIV in care and treatment (Gelaude et al., 2017; Hoffman et al., 2016), which translates to PrEP care for HIV-uninfected patients.

Despite the growing interest in PrEP, important issues remain regarding awareness, education, and adoption of PrEP as a biobehavioral HIV prevention tool. If PrEP is to maximize prevention potential, knowledge and engagement must be accelerated in groups at highest risk of HIV infection. However, uptake is impacted by qualified, capable clinicians. Given the inescapable fact that PrEP requires a prescription from a health care provider who serves a key role in the PrEP continuum of care, successful implementation of this HIV prevention measure requires a better understanding of provider

perspectives on PrEP adoption to advance the reach and efficacy of future prevention interventions. Thus, the overarching goal of our study was to qualitatively explore the attitudes, perceptions, and experiences of PrEP prescribers regarding the ideal provider type for the provision of PrEP.

Methods

Participant Recruitment

We used the publicly available New York State Department of Health PrEP/PEP (post-exposure prophylaxis) Voluntary Provider Directory in two counties to recruit potential study participants. Clinicians were contacted through phone or email and invited to participate if they met the following eligibility criteria: being a health care provider who had a license to prescribe medications in the State of New York and had prescribed PrEP for a minimum of 3 months. Overall, 28 clinicians who met the study eligibility criteria agreed to participate (90.3% of those contacted) and received a study information sheet through email. Between September 2017 and January 2018, interviews were conducted in English by trained research team members. Participants were first asked brief demographic and clinical training questions followed by a semi-structured interview that guided discussions about PrEP adoption and implementation in clinical practice. All study participants were compensated with a \$50 USD gift card. The study protocol was approved by the Institutional Review Board of the University at Buffalo, with a waiver of the requirement for written informed consent.

Data Analysis

Interviews lasted an average of 31 minutes (range = 19–56 minutes) and were digitally audio-recorded, transcribed verbatim, and analyzed using a thematic content analysis approach (Bernard, 2002; Padgett, 2012). Results reported here are from a portion of a larger scale interview covering a wide range of aspects of provider experiences with PrEP, including topics such as barriers and facilitators to uptake, patient screening protocols, and recommended skills necessary to implement PrEP in clinical practice. The answers of the participant to the interview question *What type of provider do you think should prescribe PrEP?* are described in detail here.

The analytic process was initiated in Phase 1 with three research team members familiarizing themselves with the data, including the independent reading of five transcripts for the initial codebook development using

Microsoft Excel. In Phase 2, each investigator independently coded the remaining transcripts and then met in person to compare codes, update and finalize the codebook, and resolve any coding discrepancies by discussion and mutual agreement (Weis & Fine, 2000). In Phase 3 of the analysis process, the three investigators identified themes using observed patterns in the coded qualitative data. The coding team met to review the findings, and feedback generated from the discussion was used to adjust interpretations. Although all three coders identified the same broad themes, there were minor differences in the organization of major versus minor themes, which were resolved through group discussion and resulted in agreement in the final categorization of the study findings.

Results

Participant Characteristics

Participants included 28 PrEP-prescribing health care providers, including 15 nurse practitioners, 9 physicians, and 4 physician assistants. The age of participants ranged from 29 to 72 years ($M = 40.4$ years). The sample was primarily female (78.6%) and White (78.6%). The sample included relatively experienced providers who averaged nearly 11 years in clinical practice. Overall, 64.2% of the participants were identified as PCPs, with the remaining 35.8% being identified as specialists (17.8% ID, 14.4% Women's Health/obstetrics and gynecology [OB/GYN], and 3.6% pediatrics/emergency medicine). The average number of annual PrEP prescriptions was 56. See Table 1 for additional participant characteristics.

Participants were almost equally split on ideal provider type for PrEP, with 15 choosing PCPs and 13 choosing any health care provider. Notably, no participants indicated a preference for ID or HIV specialists. Five themes emerged regarding clinician opinions about the ideal provider type for prescribing PrEP to patients. Three themes represented PCPs as the ideal provider type: (a) primary prevention, (b) greater availability, and (c) continuity of care, whereas the remaining two themes represented any health care provider as the ideal provider type: (d) PrEP simplicity and (e) risk assessment. Themes were further illustrated with representative quotes from health care providers.

Primary Prevention is the Goal of Primary Care

Providers discussed that one of the main goals of medicine was to prevent infectious and chronic diseases; therefore, PCPs were most ideally situated to educate

Table 1. Participant Demographic and Clinical Characteristics ($N = 28$)

| Characteristics | <i>n</i> (%) |
|--|--------------|
| Age, <i>M</i> (<i>SD</i>) | 40.4 (10.1) |
| Gender | |
| Female | 22 (78.6) |
| Male | 6 (21.4) |
| Race | |
| White | 22 (78.6) |
| Asian | 3 (10.7) |
| African American | 3 (10.7) |
| Profession | |
| Nurse Practitioner (NP) | 15 (53.6) |
| Physician (MD) | 9 (32.1) |
| Physician Assistant (PA) | 4 (14.3) |
| Provider Type | |
| Primary care | 18 (64.2) |
| Specialist: Infectious disease (ID) | 5 (17.8) |
| Specialist: Women's health/OB/GYN | 4 (14.4) |
| Specialist: Pediatrics and Emergency medicine | 1 (3.6) |
| PrEP prescriptions written in last year, <i>M</i> (<i>SD</i>) | 56.3 (36.2) |
| PrEP discussions with HIV-uninfected patients in last year, <i>M</i> (<i>SD</i>) | 200 (146.8) |

Note. OB/GYN = obstetrics and gynecology; PrEP = Pre-exposure prophylaxis.

patients on effective prevention strategies. Participants discussed that, as generalists, PCPs concentrated their efforts on health promotion, disease prevention, and patient education; consequently, PCP offices were a logical and practical setting for PrEP services. As one participant stated, "I think it is just common sense. I mean, it is not a disease state. It is prevention" (57-year-old PCP).

Participants thought that preventive medicine should involve proactive steps on the part of PCPs to identify individuals at risk for HIV, through the use of screening questions, and subsequently provide them with options to decrease risk of infection using a combination of

behavioral tactics, such as condom use, and pharmaceutical strategies, including PrEP and postexposure prophylaxis. As one participant shared, “I definitely think most primary care doctors can just always just bring it up when they see their patients and it is just part of preventative medicine, when they talk about their sexual history” (32-year-old PCP).

The reasoning for PCPs as the ideal PrEP provider commonly focused on the fact that this type of clinician could provide an enduring focal point for all needed health care services, including preventive care. Providers discussed the distinction between the roles and responsibilities of PCPs and HIV specialists, often indicating that a typical patient eligible for PrEP was not likely to see an ID specialist because they do not, in fact, have a communicable disease.

The infectious disease [specialists], they are probably the people who are treating the infection once you have it, but I don't think it is unreasonable that your primary could not help you prevent it. Just like if you try to prevent them from getting polio or something we vaccinate against. Your primary care doctor gives you the medicine to vaccinate against getting these infections. (35-year-old ID specialist)

Primary Care Providers Offer Greater Availability

Study participants described the higher probability of patients being able to schedule and maintain timely appointments with PCPs as opposed to specialists. Generalists were perceived to be more readily available for initial consultation visits and regular follow-ups relative to specialists. This theme was echoed by one participant who stated, “I think primary care doctors [should prescribe PrEP]. I think it is easy to get in. It is easy to get seen. It is one less obstacle to go make this appointment” (36-year-old pediatric specialist). In addition, receiving PrEP services from a PCP eliminated the need for a referral to a specialist, which might have presented a logistical barrier for patients.

There are only so many infectious disease specialists, and infectious disease does so much more than just HIV care. So they're really busy. So if you are having trouble getting appointments or suddenly you have to cancel your appointment and then like it is just a follow-up and “Well, we can't get you in...” Then is there going to be a lag time when they can get the medication. (35-year-old ID specialist)

In comparison with an HIV specialist, a PCP typically sees patients more frequently and can provide appropriate follow-up care related to PrEP. Another provider reaffirmed this idea,

I think primary care providers are more available than specialists and people, even if they need a referral for

a specialist, that's an extra barrier. You will go to a primary doctor and the primary doctor will give you the referral and so it's a longer process. If the primary care physician can do it there and then in the office, it's an easier approach. (37-year-old PCP)

Providers were often skeptical that patients would sufficiently follow up on referrals to an ID specialist for a patient eligible for PrEP, particularly if the referral was to a clinic that was associated with sexually transmitted diseases (STD) or the clinic was located in a city distant from the patient's residence in a suburban or rural area.

If I had a high-risk sexual behavior and I went to my provider to talk to them about it and they wanted me to go downtown to the STD clinic, what's the likelihood? I mean, how many of those people that they might be referred? Let's say that you're out in Clarence and your provider says “Oh, you know I want you to go down to the county health department clinic.” And I mean how many? You're going to get 1%? (57-year-old PCP)

Finally, participants also shared the idea that PCP offices were often located in patient communities, which translated to easier access and availability for eligible PrEP candidates. As one provider stated, I agree that PCPs should do it because if we have a goal to eliminate HIV, primary care needs to be on the frontline of it...I think because it's the ease of, you know, it's the availability of the provider (40-year-old PCP).

Primary Care Providers Offer Greater Continuity of Care

A commonly shared sentiment supporting primary care as the ideal location for PrEP education, prescription, and follow-up care focused on the principle of providing continuity of care in a manner that was unique to the primary care setting and environment. A key component of the patient-PCP connection was that it was an ongoing relationship that had often developed over months and years. Consequently, patients feel connected to their PCPs in a distinct way, given their health history and the information, treatment, and care provided by the PCP over time. As one provider shared, “The PCP has a lot more opportunities to have the discussion and a lot of times the patient feels more comfortable going to the primary care so that's why I chose to start prescribing” (35-year-old PCP). This concept was voiced by another participant who said, “Because it's a personal thing, generally a patient is going to see their PCP more than anyone else, so I think that would help with the rapport and the relationship” (29-year-old PCP).

PCPs are situated to offer PrEP because of the rooted relationship of trust and confidence. This partnership also offers an opportunity for greater retention and

follow-up care with patients after they initiate PrEP. Rapport building typically develops over time, as described by a PCP,

I think primary care providers should be doing it, really and truly. Just because I think we're the person who they see most often. Who they've developed the relationship with and will be more open and honest with, I think, and are used to us prescribing for them and expecting that they be compliant. And we'll get those follow-up questions asked because they see us more often. And it's usually a long-term relationship as a primary care provider that you have with someone, you know? You get episodic care from your pulmonologist, you may go see them if your asthma acts up, or cardiologist if you know you have congestive heart failure. And you're only seeing them for that one specific thing. But as a primary care provider, you take care of everything. And so I think it's really us who should be the people who are prescribing. (54-year-old PCP)

Pre-exposure Prophylaxis Simplicity Means Any Provider Can Prescribe

Although many study participants asserted that PCPs were ideally situated to offer PrEP, an almost equal proportion indicated that the prescription of PrEP should not be limited to one class or group of health care providers. Rather, many reasoned that the simplicity of PrEP translated into ease of prescription and contended that any clinician could provide it. "I really think it's not medical rocket science" (31-year-old PCP). Discussions often centered on the medical part of PrEP being straightforward.

I think it's a fairly easy drug to prescribe, so anybody technically could prescribe it whether they're primary care, whether they're OB/GYN...It's an easy drug, and it's a fairly safe drug to prescribe, so I think all providers should be willing to do it. (44-year-old ID specialist)

Comparisons were often made with other diseases to describe the simplicity of PrEP for providers who might be wary of the initial counseling, actual prescription of PrEP, and long-term follow-up and monitoring. Similar cases were considered for the need to increase the provider base of trained PrEP clinicians to impact HIV incidence.

Anybody who is providing health care should be educated on it and prescribing it. It's easier to treat frankly than diabetes and we all treat that, so I think that everybody should. You know, certainly the places that should focus on it are college campus clinics, intercity clinics that see a lot of younger people, those kinds of things. But it shouldn't be limited to just that. It should be everybody, and that's how we're going to end the AIDS epidemic. (53-year-old ID specialist)

Providers also discussed faulty impressions about PrEP as complicated or demanding, relative to other

medications. Participants often reflected on parallels to treating patients living with HIV and complex drug regimens that may lead providers to hesitate on a decision to promote PrEP with their patients, as demonstrated by this provider who shared,

I think there's a misconception among a lot of providers that these HIV medications are somewhat difficult to manage or toxic or have a lot of side effects. Yea, but I mean they really don't actually. A lot of HIV medications, you know they don't—like Truvada© and then I think a lot of people when they hear, "Oh, it's Truvada©." Then they're like, "Oh, it's an HIV medication. You know, it's going to have a lot of side effects, so it probably should only be prescribed by the HIV specialist." But, I mean, that's not really true though. (35-year-old ID specialist)

Several providers indicated the need for widespread provision of PrEP even within the same clinic setting, rather than merely having one sole PrEP prescriber.

For example, we have let's say 16 providers here at [my clinic]. I'm the only one that does HIV care. Are you going to send everyone with PrEP to me? That's kind of unreasonable because I see lots and lots of other patients, too. So PrEP should absolutely be something that everyone in our practice would feel comfortable prescribing. I don't think it's that complicated. It's way easier than doing HIV care for patients. (32-year-old PCP)

Discussions also centered on the importance of adequate clinician training related to prescription guidelines, conducting necessary baseline and follow-up laboratory testing, and monitoring over time. Despite the need for training, participants repeated the notion that actual prescription of PrEP was uncomplicated, although nonprescribers may overestimate its complexity. As one provider said,

Everybody can provide PrEP. It's not that difficult. I mean it's a lot of paper work initially. But honestly, listen—you look to make sure they don't have HIV, you make sure they're kidney function is normal, you do all the other STDs, you make sure they're taking it, and you make sure they follow up with you every 3 months. (39-year-old PCP)

All Health Care Providers Conduct Risk Assessments

Engaging in conversations with patients about sexual and drug use behavior as activities that may increase the risk for HIV infection is a core element of determining eligibility for PrEP. Several participants discussed the importance of all health care providers completing risk assessments with their patients. Consequently, PrEP should be included as a viable prevention option for those who meet clinical eligibility guidelines based on their reported behaviors.

Every provider is seeing people who are at risk for HIV and I think part of the responsibility is assessing people... they should be assessing all their patients kind of in a global way in terms of sexual risk or sexuality and having those kind of conversations with their patients. (41-year-old ID specialist)

Participants highlighted the fact that determining clinical appropriateness of PrEP for patients did not necessarily fall into the realm of only ID specialists. Rather, participants shared that although discussing risk behavior can be sensitive or uncomfortable for some providers, initiating this topic was critical for determining eligibility for PrEP. This was particularly helpful for patients who might be eligible for PrEP but fall under the radar of the provider because of the absence of an objective assessment to determine risk behaviors.

I think really anybody should [prescribe PrEP], as long as they're assessing their risk. Which I guess, I mean, that probably falls more into like the OB/GYN community and the primary care community. I mean, they need to be educated enough to educate the patient on safe practices and how it works and to monitor them. Good communication with the patients is key because sometimes they're embarrassed or standoffish and you want to make them feel like this is a discussion about risk that they can have openly and comfortably. (34-year-old women's health specialist)

Providers also described the benefit of developing specific protocols to aid in risk assessment, to determine patient eligibility for PrEP, and to share with other providers or clinics who were considering the adoption of PrEP. Leveraging a clinic system to support risk assessment among providers could facilitate PrEP provision. One provider elaborated on this point,

Any provider, I think, should prescribe PrEP. I mean, honestly, you could make—and we have one, like a laminated cheat sheet. It's like here—to be eligible, here's men who have sex with men who this, this, then women who have sex with this, this, that, right? Honestly, so much of what's happening in medicine has become these little laminated algorithms, there's no reason PrEP can't be there, too. And that is meant to be a clinical tool to make people who are not comfortable with it more comfortable, that's the whole point. (33-year-old women's health specialist)

Discussion

Clinicians are key stakeholders in PrEP engagement including the important stages of adoption, implementation, and maintenance for patients at risk of HIV infection. In our study, providers discussed their perspectives about the ideal clinicians to prescribe PrEP. Five themes emerged that centered on the explicit identification of the issue of opportunity for health care providers to embrace and offer PrEP to their patients.

Participants identified PCPs as disease prevention clinicians who were well-suited to educate about and prescribe PrEP. Although there is a lack of unanimity in protocols or guidelines for the identification of the ideal provider type for PrEP (Zablotska & O'Connor, 2017), studies of patients (Maloney et al., 2017) and health care providers (Arnold et al., 2012) have identified PCPs as the preferred provider type to prescribe PrEP, often because of long-term relationships with patients to whom they provide preventive care and treatment (Mayer, Chan, Patel, Flash, & Krakower, 2018). Consistent with our findings, engaging generalists in the delivery of PrEP fits within the range of preventive services offered by PCPs (Calabrese, Krakower, & Mayer, 2017; Mayer et al., 2018; Sharma et al., 2018).

There is also a concern that HIV prevention efforts lack a sufficient number of gatekeepers of PrEP for eligible patients (Hurt, 2018), pointing to generalists as best situated to provide PrEP, given the greater number of PCPs relative to ID specialists available to offer PrEP and their greater availability to serve at-risk patients. In our study, participants highlighted the key role that PCPs can serve in PrEP education, prescription, and follow-up care with their patients. Providers who consider themselves to be generalists offer an ongoing relationship built over time with their patients, often rooted in trust, confidentiality, and confidence. The PCP-patient partnership often offers greater accessibility and availability to patients who may be considering PrEP (Sharma et al., 2018), suggesting that PCPs can and should prescribe from logistical and feasibility standpoints (Krakower et al., 2014). Furthermore, there are approximately 8,500 ID physicians who actively provide patient care in the United States (Association of American Medical Colleges, 2016). This relatively small group is insufficient to provide PrEP to the one million individuals who meet clinical eligibility guidelines (Smith et al., 2018b). At a national level, growing the number of health care providers to the base of PrEP clinicians may aid in reducing HIV incidence; for example, the impact of targeted prevention efforts for gay and bisexual men with a PrEP uptake above 40% has been estimated to decrease HIV incidence by 33% over the course of a decade (Jenness et al., 2016).

Rather than approaching the issue as a provider type that controls the PrEP domain, many participants took a broader outlook and suggested that both generalists and specialists could and should prescribe PrEP. Findings from other studies have suggested that effective delivery of PrEP presents time and resource constraints on busy providers, suggesting that these barriers impede clinicians from providing PrEP to their eligible patients (Karris, Beekmann, Mehta, Anderson, & Polgreen,

2014; Krakower et al., 2014; Petroll et al., 2017; Wood et al., 2018). However, other studies have shown that PrEP prescription was relatively simple once appropriate training was completed (Hoffman et al., 2016; Krakower, Maloney, Grasso, Melbourne, & Mayer, 2016), which is consistent with our findings. One of the key pieces to PrEP uptake and implementation is provider awareness, which directly influences patient access and adoption. As suggested by our findings, once clinicians have been sufficiently trained, the simplicity of PrEP prescription reduces perceived logistic and practical barriers and can lead to greater access and uptake among at-risk patients.

Engaging in comprehensive risk assessment with patients can help to facilitate discussion on PrEP. For example, STDs reached a record high in 2017, with 2.3 million diagnosed cases of syphilis, gonorrhea, and chlamydia (Centers for Disease Control Prevention, 2018). This marks the fourth consecutive year of distinctly higher rates in the United States, with elevated rates seen among gay and bisexual men as well as adolescents and young adults (Centers for Disease Control Prevention, 2018), representing subpopulations at higher risk of contracting HIV. The growing availability of PrEP providers at community-based clinics, particularly those who serve sexual minority and young adult populations, such as Planned Parenthood, may facilitate PrEP uptake because PrEP-eligible individuals may feel greater comfort and have greater access to community-based organizations (Garfinkel, Alexander, McDonald-Mosley, Willie, & Decker, 2017; Hojilla et al., 2018; Mayer et al., 2018).

Despite these figures, it is important to recognize that STD screening is not conducted solely by ID specialists but also by generalists. Providers who conduct routine risk assessments with their patients may discover an asymptomatic STD, which opens a window of opportunity to educate about and offer PrEP (Smith, Chang, Duffus, Okoye, & Weissman, 2018a). Studies have demonstrated a lack of provider comfort and skills in HIV risk assessment (Krakower et al., 2012; Krakower & Mayer, 2012), which could partially explain why most eligible PrEP users fail to adopt it for HIV prevention. Our results suggest that providers who assess risk are in an ideal position to educate about and prescribe PrEP to at-risk patients, and risk assessments should be conducted routinely with all patients.

Limitations

In our study, participation was limited to health care providers in two counties in the State of New York, thus limiting generalizability to providers in other geographic

Key Considerations

- Although PrEP requires a prescription from a health care provider, we lack unanimity in guidelines for the identification of the ideal provider type to prescribe PrEP.
- As key players in the PrEP continuum of care, a better understanding of provider perspectives on PrEP adoption can advance the reach and efficacy of future prevention interventions.
- Growing the base of providers who offer PrEP to eligible patients can provide a meaningful public health impact on reducing HIV incidence.

regions. Although the analysis focused on a particular question on the interview guide, it is possible that the structure and order of the interview questions may have unintentionally influenced participant responses. In addition, the perspectives shared were drawn from the attitudes and experiences of health care providers who actively prescribed PrEP. The viewpoints and opinions expressed in this study regarding ideal PrEP providers may be different from those clinicians who do not prescribe PrEP.

Conclusion

Findings from our study make significant applied and conceptual contributions to the limited knowledge about PrEP usage among clinicians who are actively engaged in PrEP care and their considerations of ideal provider types for PrEP. Our results provide support for a growing foundation of research that warrants continued efforts to incorporate PrEP into a comprehensive HIV prevention plan. To effectively maximize presentation for care and subsequently amplify uptake of PrEP, growing the base of providers who offer PrEP to eligible patients can provide a meaningful public health impact on HIV incidence.

Disclosures

The authors report no real or perceived vested interests related to this article that could be construed as a conflict of interest.

Acknowledgments

Funding for this research was supported by the New York State Department of Health AIDS Institute. The authors wish to thank the health care providers who

generously contributed their time and effort by participating in this study.

References

- Allen, E., Gordon, A., Krakower, D., & Hsu, K. (2017). HIV preexposure prophylaxis for adolescents and young adults. *Current Opinions in Pediatrics*, 29(4), 399-406. doi:10.1097/mop.0000000000000512
- Arnold, E. A., Hazelton, P., Lane, T., Christopoulos, K. A., Galindo, G. R., Steward, W. T., & Morin, S. F. (2012). A qualitative study of provider thoughts on implementing pre-exposure prophylaxis (PrEP) in clinical settings to prevent HIV infection. *PLoS One*, 7(7), e40603. doi: 10.1371/journal.pone.0040603
- Association of American Medical Colleges. (2016). 2016 Physician Specialty Data Report. Retrieved from <https://www.aamc.org/data/workforce/reports/457712/2016-specialty-databook.html>
- Bernard, H. R. (2002). *Research methods in anthropology: Qualitative and quantitative approaches* (3rd ed.). Walnut Creek, CA: AltaMira Press.
- Blackwell, C. W. (2018). Preventing HIV infection in high-risk adolescents using preexposure prophylaxis (PrEP). *The Journal of the Association of Nurses in AIDS Care*, 29(5), 770-774. doi:10.1016/j.jana.2018.06.001
- Calabrese, S. K., Krakower, D. S., & Mayer, K. H. (2017). Integrating HIV preexposure prophylaxis (PrEP) into routine preventive health care to avoid exacerbating disparities. *American Journal of Public Health*, 107(12), 1883-1889. doi:10.2105/ajph.2017.304061
- Centers for Disease Control Prevention. (2018). Estimated HIV incidence and prevalence in the United States, 2010–2015 (1). Retrieved from <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-1.pdf>
- Flash, C., Landovitz, R., Giler, R. M., Ng, L., Magnuson, D., Wooley, S. B., & Rawlings, K. (2014). Two years of Truvada for pre-exposure prophylaxis utilization in the US. *Journal of the International AIDS Society*, 17(4 Suppl 3), 19730. doi:10.7448/ias.17.4.19730
- Garfinkel, D. B., Alexander, K. A., McDonald-Mosley, R., Willie, T. C., & Decker, M. R. (2017). Predictors of HIV-related risk perception and PrEP acceptability among young adult female family planning patients. *AIDS Care*, 29(6), 751-758. doi:10.1080/09540121.2016.1234679
- Gelaude, D. J., Hart, J., Carey, J. W., Denson, D., Erickson, C., Klein, C., ... Spitzer, T. (2017). HIV provider experiences engaging and retaining patients in HIV care and treatment: "A Soft place to fall". *The Journal of the Association of Nurses in AIDS Care*, 28(4), 491-503. doi:10.1016/j.jana.2017.03.006
- Gilead Sciences Inc. (2018). *U.S. Food and Drug Administration approves expanded indication for Truvada® (emtricitabine and tenofovir disoproxil fumarate) for reducing the risk of acquiring HIV-1 in adolescents [Press release]*. Retrieved from <https://www.gilead.com/news/press-releases/2018/5/us-food-and-drug-administration-approves-expanded-indication-for-truvada-emtricitabine-and-tenofovir-disoproxil-fumarate-for-reducing-the-risk-of-acquiring-hiv1-in-adolescents>
- Hart-Cooper, G. D., Allen, I., Irwin, C. E. Jr, & Scott, H. (2018). Adolescent health providers' willingness to prescribe pre-exposure prophylaxis (PrEP) to youth at risk of HIV infection in the United States. *Journal of Adolescent Health*, 63(2), 242-244. doi:10.1016/j.jadohealth.2018.03.016
- Hoffman, S., Guidry, J. A., Collier, K. L., Mantell, J. E., Boccher-Lattimore, D., Kaighobadi, F., & Sandfort, T. G. (2016). A clinical home for preexposure prophylaxis: Diverse health care providers' perspectives on the "Purview Paradox". *Journal of the International Association of Providers in AIDS Care*, 15(1), 59-65. doi:10.1177/2325957415600798
- Hojilla, J. C., Vlahov, D., Crouch, P. C., Dawson-Rose, C., Freeborn, K., & Carrico, A. (2018). HIV pre-exposure prophylaxis (PrEP) uptake and retention among men who have sex with men in a community-based sexual health clinic. *AIDS and Behavior*, 22(4), 1096-1099. doi: 10.1007/s10461-017-2009-x
- Hurt, C. B. (2018). PrEParing providers: The next challenge in implementing human immunodeficiency virus preexposure prophylaxis. *Sexually Transmitted Diseases*, 45(7), 459-461. doi: 10.1097/olq.0000000000000835
- Jenness, S. M., Goodreau, S. M., Rosenberg, E., Beylerian, E. N., Hoover, K. W., Smith, D. K., & Sullivan, P. (2016). Impact of the Centers for Disease Control's HIV Preexposure Prophylaxis Guidelines for men who have sex with men in the United States. *Journal of Infectious Diseases*, 214(12), 1800-1807. doi:10.1093/infdis/jiw223
- Karris, M. Y., Beekmann, S. E., Mehta, S. R., Anderson, C. M., & Polgreen, P. M. (2014). Are we prepped for preexposure prophylaxis (PrEP)? Provider opinions on the real-world use of PrEP in the United States and Canada. *Clinical Infectious Diseases*, 58(5), 704-712. doi: 10.1093/cid/cit796
- Krakower, D., & Mayer, K. H. (2012). What primary care providers need to know about preexposure prophylaxis for HIV prevention: A narrative review. *Annals of Internal Medicine*, 157(7), 490-497. doi: 10.7326/0003-4819-157-7-201210020-00510
- Krakower, D. S., Maloney, K. M., Grasso, C., Melbourne, K., & Mayer, K. H. (2016). Primary care clinicians' experiences prescribing HIV pre-exposure prophylaxis at a specialized community health centre in Boston: Lessons from early adopters. *Journal of the International AIDS Society*, 19(1), 21165. doi:10.7448/ias.19.1.21165
- Krakower, D. S., Mimiaga, M. J., Rosenberger, J. G., Novak, D. S., Mitty, J. A., White, J. M., & Mayer, K. H. (2012). Limited awareness and low immediate uptake of pre-exposure prophylaxis among men who have sex with men using an internet social networking site. *PLoS One*, 7(3), e33119. doi:10.1371/journal.pone.0033119
- Krakower, D., Ware, N., Mitty, J. A., Maloney, K., & Mayer, K. H. (2014). HIV providers' perceived barriers and facilitators to implementing pre-exposure prophylaxis in care settings: A qualitative study. *AIDS and Behavior*, 18(9), 1712-1721. doi:10.1007/s10461-014-0839-3
- Maloney, K. M., Krakower, D. S., Ziobro, D., Rosenberger, J. G., Novak, D., & Mayer, K. H. (2017). Culturally competent sexual healthcare as a prerequisite for obtaining preexposure prophylaxis: Findings from a qualitative study. *Laboratory Hematology*, 4(4), 310-314. doi:10.1089/lgbt.2016.0068
- Mayer, K. H., Chan, P. A., Patel, R. R., Flash, C. A., & Krakower, D. S. (2018). Evolving models and ongoing challenges for HIV preexposure prophylaxis implementation in the United States. *Journal of Acquired Immune Deficiency Syndromes*, 77(2), 119-127. doi:10.1097/qai.0000000000001579
- Mullins, T. L., Zimet, G., Lally, M., & Kahn, J. A. (2016). Adolescent human immunodeficiency virus care providers' attitudes toward the use of oral pre-exposure prophylaxis in youth. *AIDS Patient Care and STDs*, 30(7), 339-348. doi:10.1089/apc.2016.0048
- Padgett, D. (2012). *Qualitative and mixed methods in public health* (2nd ed.). Thousand Oaks, CA: Sage.
- Patel, R. R., Chan, P. A., Harrison, L. C., Mayer, K. H., Nunn, A., Mena, L. A., & Powderly, W. G. (2018). Missed opportunities to prescribe HIV pre-exposure prophylaxis by primary care providers in Saint Louis, Missouri. *Laboratory Hematology*, 5(4), 250-256. doi:10.1089/lgbt.2017.0101
- Petroll, A. E., Walsh, J. L., Owczarzak, J. L., McAuliffe, T. L., Bogart, L. M., & Kelly, J. A. (2017). PrEP awareness, familiarity, comfort, and prescribing experience among US primary care providers and HIV specialists. *AIDS and Behavior*, 21(5), 1256-1267. doi:10.1007/s10461-016-1625-1
- Pollock, L., & Levison, J. (2018). Role of preexposure prophylaxis in the reproductive health of women at risk for human immunodeficiency virus infection. *Obstetrics and Gynecology*, 132(3), 687-691. doi: 10.1097/aog.0000000000002801
- Seidman, D., Carlson, K., Weber, S., Witt, J., & Kelly, P. J. (2016). United States family planning providers' knowledge of and attitudes towards preexposure prophylaxis for HIV prevention: A national survey. *Contraception*, 93(5), 463-469. doi:10.1016/j.contraception.2015.12.018

- Seidman, D., & Weber, S. (2016). Integrating preexposure prophylaxis for human immunodeficiency virus prevention into women's health care in the United States. *Obstetrics and Gynecology*, *128*(1), 37-43. doi:10.1097/aog.0000000000001455
- Sharma, M., Chris, A., Chan, A., Knox, D. C., Wilton, J., McEwen, O., ... Tan, D. H. S. (2018). Decentralizing the delivery of HIV pre-exposure prophylaxis (PrEP) through family physicians and sexual health clinic nurses: A dissemination and implementation study protocol. *BMC Health Services Research*, *18*(1), 513. doi:10.1186/s12913-018-3324-2
- Silapaswan, A., Krakower, D., & Mayer, K. H. (2016). Pre-exposure prophylaxis: A narrative review of provider behavior and interventions to increase PrEP implementation in primary care. *Journal of General Internal Medicine*, *32*(2), 192-198. doi:10.1007/s11606-016-3899-4
- Smith, D. K., Chang, M. H., Duffus, W. A., Okoye, S., & Weissman, S. (2018a). Missed opportunities to prescribe preexposure prophylaxis in South Carolina, 2013-2016. *Clinical Infectious Diseases*, *68*(1), 37-42. doi:10.1093/cid/ciy441
- Smith, D. K., Mendoza, M. C., Stryker, J. E., & Rose, C. E. (2016). PrEP awareness and attitudes in a national survey of primary care clinicians in the United States, 2009-2015. *PLoS One*, *11*(6), e0156592. doi:10.1371/journal.pone.0156592
- Smith, D. K., Van Handel, M., & Grey, J. (2018b). Estimates of adults with indications for HIV pre-exposure prophylaxis by jurisdiction, transmission risk group, and race/ethnicity, United States, 2015. *Annals of Epidemiology*, *28*(12), 850-857. doi:10.1016/j.annepidem.2018.05.003
- Turner, L., Roepke, A., Wardell, E., & Teitelman, A. M. (2018). Do you PrEP? A review of primary care provider knowledge of PrEP and attitudes on prescribing PrEP. *Journal of the Association of Nurses in AIDS Care*, *29*(1), 83-92. doi:10.1016/j.jana.2017.11.002
- U.S. Department of Health and Human Services. (2012). FDA approves first drug for reducing the risk of sexually acquired HIV infection [Press release]. Retrieved from <https://aidsinfo.nih.gov/news/1254/fda-approves-first-drug-for-reducing-the-risk-of-sexually-acquired-hiv-infection>
- Weis, L., & Fine, M. (2000). *Speed bumps: A student-friendly guide to qualitative research*. New York, NY: Teachers College Press.
- Wood, B. R., McMahan, V. M., Naismith, K., Stockton, J. B., Delaney, L. A., & Stekler, J. D. (2018). Knowledge, practices, and barriers to HIV preexposure prophylaxis prescribing among Washington State medical providers. *Sexually Transmitted Diseases*, *45*(7), 452-458. doi:10.1097/olq.0000000000000781
- Zablotska, I. B., & O'Connor, C. C. (2017). Preexposure prophylaxis of HIV infection: The role of clinical practices in ending the HIV epidemic. *Current HIV/AIDS Reports*, *14*(6), 201-210. doi:10.1007/s11904-017-0367-7