

AU-PCTE Research Policy Brief

I. Title: Training of Medical Students and Residents in the Administration of Pre-Exposure Prophylaxis: A Systematic Review

II. Executive Summary

Background. Although the incidence of Human Immunodeficiency Virus (HIV) has been declining over the past decade, approximately 50,000 new infections are diagnosed annually in the United States. Men who have sex with men (MSM) and transgender women continue to have higher rates of infection in the US. MSM make up 58% of people living with HIV, although they only account for 2% of the population. People who inject drugs (PWID) account for an additional 8% of newly diagnosed HIV infections while African American women account for 19%. A growing body of research has shown high levels of Pre-exposure prophylaxis (PrEP) efficacy in reducing the risk of contracting HIV. PrEP has been found to reduce the risk of infection between 44% and 86%, and with greater adherence, reductions are even higher. Despite the high efficacy of PrEP, prescription rates remain low. The study was guided by two questions: 1) Are medical students currently being taught how to prescribe PrEP for patients who are at risk for HIV? 2) What are the barriers to prescribing PrEP?

Methods. A systematic review of the literature was conducted using three databases (PubMed, CINAHL, & Web of Science) to address the research questions. Search terms included: HIV prevention, pre-exposure prophylaxis, primary care, medical education and training. A total of 560 articles were found. Titles and abstracts were reviewed to determine relevance to the research questions and eliminate duplicate articles reducing this number to 26. The full text of the 26 articles were then reviewed for relevance to the research questions. Twenty-one (21) articles remained for inclusion in this review.

Results. No articles or studies were found that focused on how prescribing PrEP is being taught to medical students. Barriers to prescribing PrEP by practicing primary care providers were identified, however, and a PrEP cascade for prescribing PrEP was identified.

Recommendations. This review included four recommendations: 1) Medical schools should adapt a universal PrEP curriculum for its patient population using the PrEP cascade model; 2) medical students should be taught how to universally screen candidates for PrEP appropriateness (MSM, transgender women, discordant couples, African American women, young persons who have multiple partners, and PWID); 3) Medical students need to be familiar with patient medication assistance programs; and 4) medical students need to be taught how to monitor PrEP adherence.

Key stakeholders. Key stakeholders include but are not limited to academic medical institutions, medical education accreditation bodies, health care providers, advocacy groups, health insurance providers, pharmaceutical companies, public health officials, policymakers, health professions associations, and populations at risk.

III. Issue

While new diagnoses of HIV have been declining over the past decade, approximately 50,000 new infections are diagnosed annually in the United States.¹ Pre-Exposure Prophylaxis (PrEP), a once daily combination antiretroviral medication (tenofovir and emtricitabine) has been shown in multiple studies to reduce the risk of infection by between 44% and 86%,² and with greater adherence, reductions are even higher.^{3,4} While it is estimated that 1.2 million people could benefit from taking PrEP, currently only 49,000 are taking this medication.⁵ Persons at highest risk for HIV transmission, include men who have sex with men (MSM), transgender females, injection drug users, discordant couples, and women with multiple sex partners, particularly African American women. These sub-populations have been identified as appropriate candidates for pre-exposure prophylaxis (PrEP). This study was guided by two research questions: 1) Are medical students currently being taught how to prescribe PrEP for patients who are at risk for HIV?; and 2) What are the barriers to prescribing PrEP?

IV. Background

The efficacy of PrEP as a preventative measure, has been tested in multiple studies,¹⁴⁻²⁰ and meta-analyses^{21,22} and findings suggest that, when used consistently, PrEP results in significantly decreased rates of HIV infection. A recent meta-analysis of PrEP efficacy confirmed that PrEP was equally effective for men and women.²³ Despite the high level of efficacy of PrEP, less than 4.2% of persons in the US who would benefit from it, currently have a PrEP prescription. In order for PrEP to reach its full potential in reducing HIV, those individuals at highest risk must gain widespread access. This access will only be achieved by increasing the pool of willing and able prescribing physicians and consumers. While barriers to PrEP prescribing to at-risk populations have been noted in the literature,³³⁻⁵³ training medical students to prescribe will be critical to the full realization of PrEP's preventive possibilities.

While PrEP is an important tool for ending the HIV epidemic. Yet, there is no evidence that US medical schools currently are training students how to administer PrEP. Knowledge among primary care providers about PrEP is low and medical students are not being taught to prescribe it. To reduce the incidence of HIV infection, accrediting bodies should take a position on making the integration of PrEP prescription training mandatory in all all US medical schools.

The goals of this review were to determine prescribing practices of primary care physicians, how prescribing was taught in medical schools and to make recommendations for enhancements in medical education to ensure that physicians entering practice will have the knowledge, skills, and intent to deliver PrEP to at-risk populations with the long term aim of ending the HIV epidemic. The need to develop curricula that include PrEP training is directly in line with the National HIV/AIDS prevention strategy to better equip doctors with the skills needed to reduce the incidence of HIV. We organized our findings utilizing the PrEP cascade,³⁴ (see Table 1.) and provide both content and educational delivery method recommendations.

V. Methods

To address the research questions, a systematic review of articles was conducted from four databases (PubMed, CINAHL, Web of Science and PsycInfo). Search terms, inclusion and exclusion criteria were developed to conduct the systematic review. Initially, a total of 560 articles were found that met the search criteria. Next, titles and abstracts were reviewed to determine relevance to the research questions and to eliminate duplicate articles which reduced this number to 26. The full text of the 26 articles were then reviewed for relevance to the research questions. The CORE-Q checklist 54 was used to review qualitative studies and the STROBE checklist 55 for cross sectional surveys. After the full text review, 21 articles remained for inclusion in the review.

VI. Limitations

The limitations of our study included the small sample size of articles that fit the search criteria, and the gaps in current literature regarding physicians' knowledge, skills, and prescription behavior regarding PrEP. The most evident gap is the lack of studies that have examined the effectiveness of PrEP prescription training to medical students on increasing PrEP prescription behavior. In addition, few studies have examined the rate of at-risk patients who may benefit from PrEP prescription in primary care.

VII. Results

The systematic review found no articles or studies that focused on how PrEP prescription is being taught to medical students. Results found, however, that among health care providers, there has been much confusion about whether PrEP should be delivered by HIV specialists or by primary care providers.³⁴ The purview barrier refers to HIV specialists being the most informed and skilled in the delivery of antiretrovirals, contrasted with the need for primary care physicians to deliver PrEP as they are more likely to encounter high risk, HIV negative persons. Generalists often cited the lack of knowledge about antiretroviral medications as a barrier to implementing PrEP in general practice settings.^{40,43,50} A national study of PrEP providers conducted annually from 2009-2015⁴⁴ found that HIV specialists were most likely to prescribe PrEP, but over time, the number of primary care physicians prescribing PrEP has steadily risen.^{42,43}

Other systemic provider concerns identified, included a lack of resources to support prescriptions for PrEP patients,^{34,45,52} and the need for adherence monitoring.^{33,37,40,47-52} PrEP prescription without financial assistance is expensive, and many patients that may benefit most from PrEP may not have insurance or a means to pay for the prescription. Physicians in several of the studies noted this concern.^{34,45,52} However, a wealth of resources were identified to support patients that are appropriate candidates for the medication, including the Patient Advocacy Foundation, Gilead Sciences, and many state based programs.³³ Additionally, for PrEP to be successful, adherence must be monitored and encouraged and regular check-ups are included in the PrEP protocol to identify any adverse consequences from the medication.^{33,37,40,47-52} To achieve this, providers will need to increase patient communication regarding sexual risk, increase knowledge and willingness to prescribe PrEP, identify patient sexual risk behavior, and discuss these risks non-judgmentally. Each of these factors can decrease the

likelihood of providers prescribing PrEP.

VIII. Discussion

For PrEP to be delivered on a scale that can reduce HIV transmission among at-risk populations and fulfill its potential role for ending the epidemic, consensus among medical educators on the venue for PrEP must be agreed upon and communicated. Delivering PrEP in primary care settings will require sexual histories to be taken regularly, HIV testing to be performed more frequently, and HIV prevention messages to be delivered in culturally appropriate ways and made universally to a wide range of patients. Medical students must be exposed to training in LGBTQ and PWID affirming practices. In order for PrEP to be delivered in real world settings, primary care physicians will need training to identify appropriate candidates for PrEP based on risk assessment, patient data from electronic medical records, patient preferences for use of chemoprophylaxis, and to become comfortable in prescribing and monitoring patient adherence and knowledge about patient assistance programs. Primary care residency training programs might focus on low cost methods (i.e., self-report for monitoring adherence in the patient-centered medical home clinical setting to ensure cost of PrEP remains low and available to promote patient adherence. Because mental health and substance abuse are factors that impact adherence and retention, medical students should receive training in screening and intervention approaches to ensure these barriers do not affect medication adherence. These skills have broad applicability and can easily be integrated into the medical school education curriculum. If PrEP is to be a viable preventive measure and to realize its potential in ending the HIV epidemic, physicians must be trained to deliver PrEP and barriers to prescribing it must be addressed in training.

Integrating PrEP prescription training into the curriculum will aid in the fight to end the HIV epidemic. The PrEP cascade was identified as a framework for teaching medical students and residents the requisite knowledge and skills to deliver PrEP in their future practice and for assessing PrEP delivery and adherence. The PrEP Cascade, adapted from Liu, Colfax, Bacon, Kolber, et al. (2015) is presented in Table 1.

Table 1: Elements of the PrEP Cascade and Educational Recommendations

PrEP Cascade	Educational Recommendations
Identify populations at risk for HIV	Utilize health services research projects to familiarize students and residents with population and individual risk.
Identify PrEP candidate	Create algorithms in Electronic Health Record (EHR) systems to identify those at high risk for HIV. Increase community knowledge of PrEP through educational materials, and PrEP testimonials from PrEP users.

Train medical students about PrEP prescription	Address student bias/cultural competence regarding risk populations. Increase student/resident knowledge of PrEP. Utilize HIV specialist knowledge to train medical students about pharmacology, anti-retro viral therapy, and side effects. Teach students to conduct culturally appropriate sexual risk history. Increase sexual risk assessment training, make standard of care in teaching hospitals. Develop behavioral intervention to increase PrEP interest.
Link to PrEP	Teach students how to prescribe PrEP. Allow students to shadow PrEP delivery sessions. Develop simulated patient encounters to develop student skills in PrEP prescription and adherence.
Initiate PrEP prescription	Teach students to assess patients for medical assistance program eligibility.
Track PrEP adherence	Utilize PrEP navigators and other support staff to track retention. Introduce patient interactive messaging to residents and students as a means to improve adherence.
Achieve adherence and persistence	Train students to monitor adherence via self-reported adherence measures as standard care. Increase substance abuse and mental health screening, and referral, perhaps using Screening, Brief Intervention and Referral to Treatment (SBIRT) type models.

IX. Recommendations

This review included four recommendations: 1) Medical schools should adapt a universal PrEP curriculum for its patient population using the PrEP cascade model; 2) medical students should be taught how to universally screen candidates for PrEP appropriateness (MSM, transgender women, discordant couples, African American women, young persons who have multiple partners, and PWID); 3) Medical students need to be familiar with patient medication assistance programs; and 4) medical students need to be taught how to monitor PrEP adherence.

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XI. References

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