

US Human Immunodeficiency Virus (HIV) Practitioners' Recommendations Regarding Condomless Sex in the Era of HIV Pre-Exposure Prophylaxis and Treatment as Prevention

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Background. We sought to characterize human immunodeficiency virus (HIV) practitioners' recommendations to patients regarding treatment as prevention, pre-exposure prophylaxis (PrEP) and condom use among persons with HIV (PWH) with viral suppression and individuals receiving PrEP.

Methods. A brief survey about counseling practices was distributed electronically to previous attendees of an International Antiviral Society–USA continuing medical education activity. Descriptive analyses were performed for all questions. Pearson χ^2 tests were used to identify potential differences in counseling practices based on sex, degree/license, years in practice, number of PWH cared for in the past year, and practice location.

Results. Of the 3238 persons surveyed, 478 (15%) responded. 65% were female, 47% were physicians, 78% had been in practice ≥ 6 years, and 52% had cared for >100 PWH in the last year. Of the respondents, 51% (95% confidence interval, 46.8%–56.0%) agreed that the evidence “supports, strongly supports or proves” that condomless sex with a PWH with viral suppression does not lead to HIV transmission, and 76% (72.2%–80.0%) commonly or always recommend condoms for such patients. Although 42% (95% confidence interval, 37.0%–46.0%) of respondents said the evidence “supports, strongly supports or proves” that condomless sex involving a person at risk for HIV infection receiving PrEP does not lead to HIV transmission, 81% (77.3%–84.5%) commonly or always recommend condom use for such patients. Responses differed significantly by practitioner experience, region, sex and degree.

Conclusions. Although many practitioners caring for individuals with and at risk for HIV infection acknowledge that successful treatment or PrEP prevents transmission, the majority of practitioners commonly or always recommend condom use.

Keywords. condom use; HIV prevention; pre-exposure prophylaxis; survey; treatment as prevention.

From 2005 to 2014, the estimated number of annual human immunodeficiency virus (HIV) infections in the United States declined by 18% [1] and this decrease can largely be attributed to several biomedical interventions that have been shown to significantly reduce HIV transmission. Early antiretroviral therapy (ART), in which ART is started in persons with HIV (PWH) regardless of their CD4 cell count, can reduce HIV transmission among HIV-serodiscordant partners by 96% [2]. In addition, observational studies of heterosexual and same-sex HIV-serodiscordant partners have shown that PWH who achieve viral suppression (PWHvs) during ART are unlikely

to transmit to their partners, even in the absence of consistent condom use [3]. Together, these data strongly support the concept of treatment as prevention (TasP).

Another highly effective area of biomedical prevention is HIV pre-exposure prophylaxis (PrEP). Multiple studies have demonstrated that the use of antiretroviral medications by HIV-uninfected individuals at risk for acquiring HIV before exposure can reduce transmission among men and transgender women who have sex with men [4], HIV-serodiscordant couples [5], heterosexual individuals with multiple sex partners [6], and persons who inject drugs [7].

Risk reduction counseling, including information regarding the importance of routine condom use in conjunction with effective ART or PrEP has typically been a component of the counseling provided in clinical trial settings, but less is known about “real world” counseling messages. Although practitioners are encouraged to share the message that “undetectable equals untransmittable” the high rates of sexually transmitted infections (STIs) among PWH [8] and persons receiving PrEP [9, 10] may influence those providing the counseling.

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Debates regarding how best to counsel patients regarding condom use have ensued at national conferences and generated much discussion, but to our knowledge formal assessments of practitioners' counseling practices have not been performed. We conducted a national survey of HIV practitioners in the United States to assess their attitudes toward the efficacy of PrEP and TasP, as well as their practice recommendations regarding condomless sex in PWHs and those who are receiving PrEP.

METHODS

Study Population

The International Antiviral Society–USA (IAS–USA) is a not-for-profit professional education organization that sponsors continuing medical education programs and includes an extensive network of experienced and committed experts in the management of HIV. On 11 October 2017, a confidential electronic survey was sent to individuals who had attended an IAS–USA conference or event within the preceding year. A single reminder email was sent 1 week after the initial email. A statement of informed consent was included at the beginning of the survey and no incentives were provided. The study was approved by the Institutional Review Board of the University of Nebraska Medical Center.

Survey

A 9-question survey assessed practitioners' views regarding the evidence to support condomless sex and their counseling recommendations regarding condom use for PWHs and persons receiving HIV PrEP (Supplementary Appendix A). Participant demographics including sex, license type, years in practice, number of HIV-infected patients under their care, and location of practice were also collected.

Statistical Analyses

Descriptive analyses were conducted on all questions. Pearson χ^2 tests were used to evaluate potential differences in counseling practices based on sex, degree/license, years in practice, number of PWH cared for in the past year, and practice location. Monte Carlo approximations were used to estimate exact *P* values in instances where >25% of expected cell sizes were <5. Statistical analyses were conducted using SAS version 9.3, and differences were considered significant at *P* < .05.

RESULTS

Survey Respondents

Of the 3238 persons surveyed, 478 (15%) responded. Of the respondents, 21 were excluded from the analysis because they indicated they were not involved in patient care. Overall, 65% of respondents were female, 47% were physicians, 78% had been in practice \geq 6 years, and 52% had cared for >100 HIV-infected patients in the last year (Table 1).

Table 1. Demographic Characteristics of Respondents

Characteristic	Respondents, No. (%) (N = 478)
Female sex	302 (65)
Degree/license	
MD/DO	217 (47)
PA/NP	122 (26)
PharmD	39 (8)
RN	72 (16)
Other	13 (3)
Time in practice, y	
1–5	103 (22)
6–10	70 (15)
11–15	44 (10)
16–20	52 (11)
21–25	59 (13)
>26	134 (29)
No. of HIV-infected patients cared for in past year	
None	21 (5)
1–50	116 (25)
51–100	84 (18)
>100	241 (52)
Location of US practice	
South	139 (30)
Midwest	71 (15)
Northeast	149 (32)
West	85 (18)
Other (Alaska/Hawaii and Other US)	20 (4)

Abbreviation: HIV, human immunodeficiency virus.

Views on Evidence Regarding Condomless Sex Among PWHs With Complete Viral Suppression

Overall, 51% (95% confidence interval [CI], 46.8%– 56.05%) of respondents agreed that the evidence “proves, strongly supports or supports” that condomless sex does not lead to HIV transmission in the setting of viral suppression and either recommend, cautiously recommend, or support patients' choices regarding condomless sex (Figure 1). Only 3% of respondents selected answer “a,” which characterized TasP and condomless sex in the setting of full viral suppression with good adherence as “settled science,” and which endorsed an active recommendation of condomless sex. Respondents from the Midwest were significantly more likely to view the science as generally settled (70%), whereas respondents from the South and West were significantly less likely to view the research as settled (37% and 34%, respectively) (*P* = .003). Views regarding the strength of the evidence did not differ significantly by sex, practitioner type, or practice volume (ie, number of PWH cared for in prior year), although there was a trend when it came to years of practice. Respondents with fewer years of experience were more likely to find the research generally settled, but this difference was not statistically significant (*P* = .21).

Counseling Practices Regarding Condom Use for PWHs With Complete Viral Suppression

Most respondents (76%; 95% CI, 72.2%–80.0%) indicated that they “often or usually” ask about and recommend condoms to PWHs (Figure 2). Recommendations regarding condom use did not differ significantly by years of experience, practice volume (number of PWH cared for in the prior year), or location of practice. Female practitioners were more likely to recommend condoms often or usually for PWHs than male practitioners (80% vs 71%; $P = .02$). Pharmacists were less likely to recommend condoms as often as physicians, advance practice providers, and nurses (59% vs 81%, 76% and 72%, respectively; $P = .02$). There was a marginally significant result associated with practice volume; practitioners with the lowest practice volume were less likely to recommend condoms as often as practitioners with the midrange or highest practice volumes (73% vs 83% and 77%; $P = .057$).

Views on Evidence Regarding Condomless Sex Among Patients Receiving PrEP

Overall, 42% (95% CI, 37.0%–46.0%) of respondents agreed the evidence “proves, strongly supports, or supports” that condomless sex involving a person with HIV and a person on PrEP with good adherence does not lead to HIV transmission (Figure 3). Twenty-two percent of practitioners selected answers “a” or “b,” which characterized the efficacy of PrEP as “settled or largely settled” science and endorsed an active recommendation of condomless sex. Respondents from the

Midwest were significantly more likely to view the science as generally settled than those from the South, Northeast, or West (58% vs 35%, 43% and 36%, respectively; $P = .01$). Respondents with up to 5 years of experience were significantly more likely to view the science as generally settled than those with more experience (60% vs 32%–49% for higher experience levels; $P = .03$).

Counseling Practices Regarding Condom Use for Patients Receiving PrEP

Most respondents (81%; 95% CI, 77.3%–84.5%) stated that they “often or usually” ask about and recommend condoms to persons at risk for HIV infection receiving PrEP (Figure 4). Recommendations regarding condom use did not differ significantly by sex, years of experience, practice volume (number of PWH cared for in prior year), or location of practice. Pharmacists were least likely to recommend condoms often or usually, and physicians were most likely to do so (69% vs 87%; $P = .002$).

DISCUSSION

Condoms have been considered an essential component of comprehensive HIV prevention programs. In the era of effective HIV treatment and HIV PrEP, the necessity of condoms for the prevention of HIV transmission has been debated, and counseling practices regarding condom use are evolving. In addition, patient practices are evolving; a recent study showed that condom use in Australia has decreased as PrEP use has increased. The proportion who reported condomless sex while

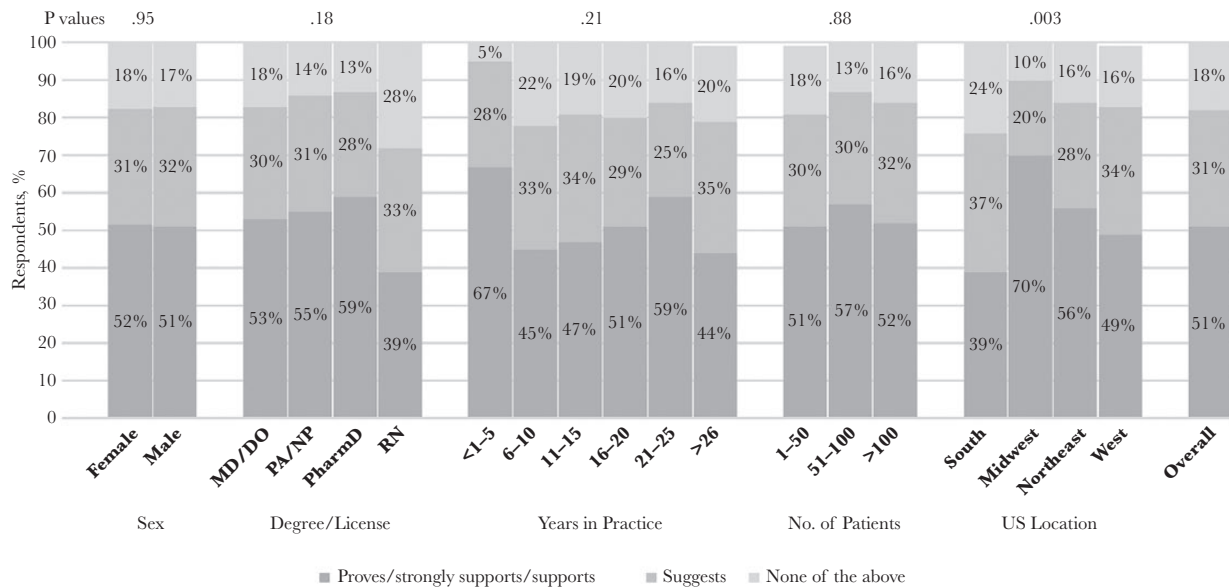


Figure 1. Practitioners’ views regarding the evidence behind human immunodeficiency virus (HIV) transmission through condomless sex for persons with HIV taking antiretroviral therapy and achieving PWHs. Respondents indicated how strongly they found the evidence to be in support of condomless sex in this population. These responses were analyzed based on multiple demographic categories. Half (51%) found the evidence at least supportive for condomless sex not leading to HIV transmission, and practitioners from the Midwest were most likely to be in this group (70%).

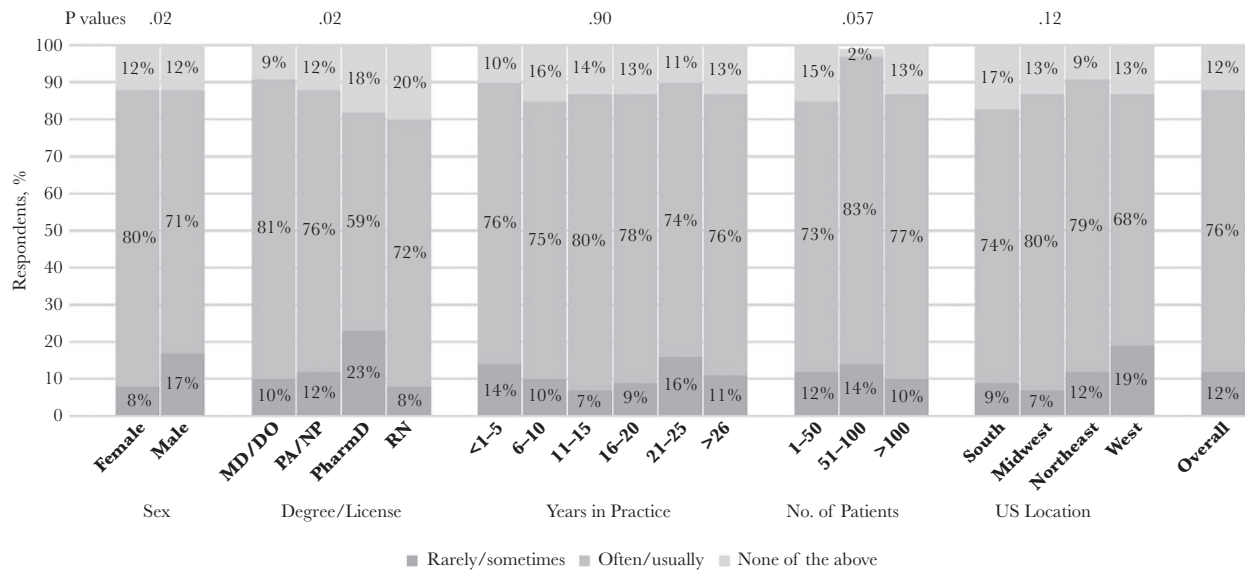


Figure 2. Practitioners' recommendations on condom use for persons with human immunodeficiency virus taking antiretroviral therapy and achieving PWHs. Respondents indicated how often in their personal practice they ask about and suggest that patients in this population use condoms. A majority (76%) often or usually recommended condom use. Female practitioners were more likely to recommend condoms (80%), and practitioners with a PharmD degree were the least likely to routinely recommend condoms for this patient population (59%).

receiving PrEP increased from 1% to 16% between 2013 and 2017, and consistent condom use decreased from 46% to 31% over the same period [11]. In our national survey of HIV practitioners, most of whom have been in practice for >10 years

and see >100 PWH per year, we found that only 51% and 42% of respondents accept the evidence of the efficacy of TasP and PrEP, respectively, and would recommend the safety of condomless sex. At the same time, most respondents routinely

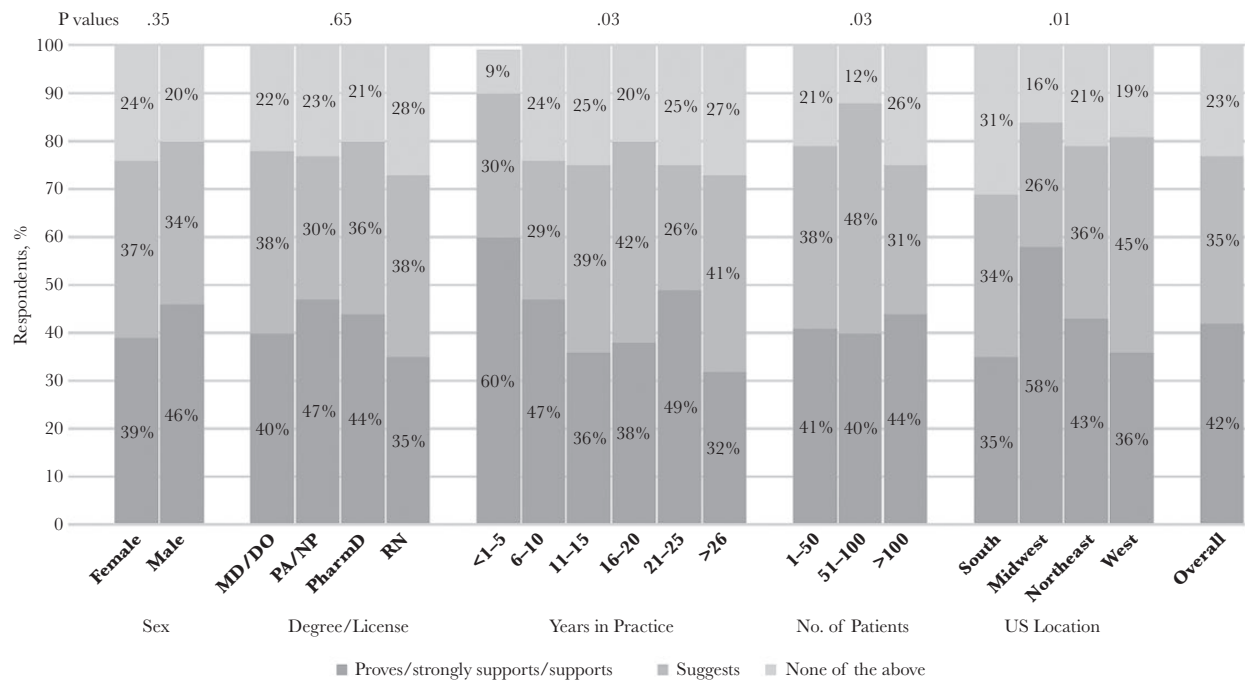


Figure 3. Practitioners' views regarding the evidence behind human immunodeficiency virus (HIV) transmission through condomless sex for patients receiving PrEP. Respondents indicated how strongly they found the evidence to be in support of condomless sex in this population. Only 42% found the evidence at least supportive for condomless sex not leading to transmission, versus 51% in persons with HIV taking antiretroviral therapy and achieving viral suppression. Practitioners in the Midwest found the evidence most supportive (58%), along with practitioners with ≤5 years of experience (60%).

recommend condom use for PWHvs (76%) and patients at risk for HIV receiving PrEP (81%).

Generally, respondents were more likely to recommend condom use for patients receiving PrEP than they were for PWHvs. PrEP is a more recent tool in the prevention of HIV transmission, but HIV transmission is not the only concern for PrEP prescribers. Prior surveys assessing practitioner-level barriers to PrEP note concerns for risk compensation and incident STIs, and practitioner concerns have been confirmed in the literature [12, 13]. Recent data suggest that incident STIs and acute hepatitis C are increasing among individuals receiving PrEP, and this may have introduced some tension in the fields of HIV and STI prevention that is reflected in our survey [14].

Although numerous high-impact studies have confirmed the low risks of HIV transmission among PWHvs, only 3% of respondents believed that the science in this area is settled. Similarly, only 22% of respondents agreed that the evidence that condomless sex involving a person at risk for HIV infection taking PrEP with good adherence does not lead to HIV transmission is settled or largely settled. Although respondents were not given the opportunity to explain why they think the data are incomplete, it is interesting to note that practitioners with >25 years of experience in the field were more likely to find the evidence regarding PrEP incomplete, especially compared with those with <5 years of experience (32% vs 49%, respectively). It is possible that the less experienced practitioners were younger and better informed on the emerging evidence of PrEP and TasP efficacy than more experienced respondents.

Some other interesting associations were noted when we analyzed counseling practices by certain demographic variables. Pharmacists were less likely to recommend condoms for both PWHvs and patients receiving PrEP. Although pharmacists are increasingly involved in direct patient care, they do not always receive training in risk-reduction counseling, which may explain pharmacists' reduced emphasis on condom use [15].

Although our sample size is robust, our study is limited by the fact that respondents were all prior attendees of an IAS-USA event who chose to complete the survey and may be subject to response bias. The respondents may therefore not reflect the general HIV/PrEP provider population. In addition, counseling practices are often more nuanced than the options presented in this survey. The fact that a significant number of respondents chose "none of the above" when asked to describe their counseling practices for both PWHvs (12%) and patients receiving PrEP (16%) probably reflects the fact that HIV and STI prevention counseling is often more complex. Future surveys exploring the rationale for or against practitioners' condom recommendations would be interesting.

It is also important to note that, although the U=U (Undetectable equals Untransmittable) campaign was launched in 2016 [16], practitioner awareness of the campaign has been gradual and supportive literature has only recently reached the most high-impact general medicine journals, so practitioners' recommendations may have changed since the time of our survey. Overall, our results demonstrate that practitioners are hesitant to recommend condomless sex to patients with or at risk for HIV. Perhaps more importantly,

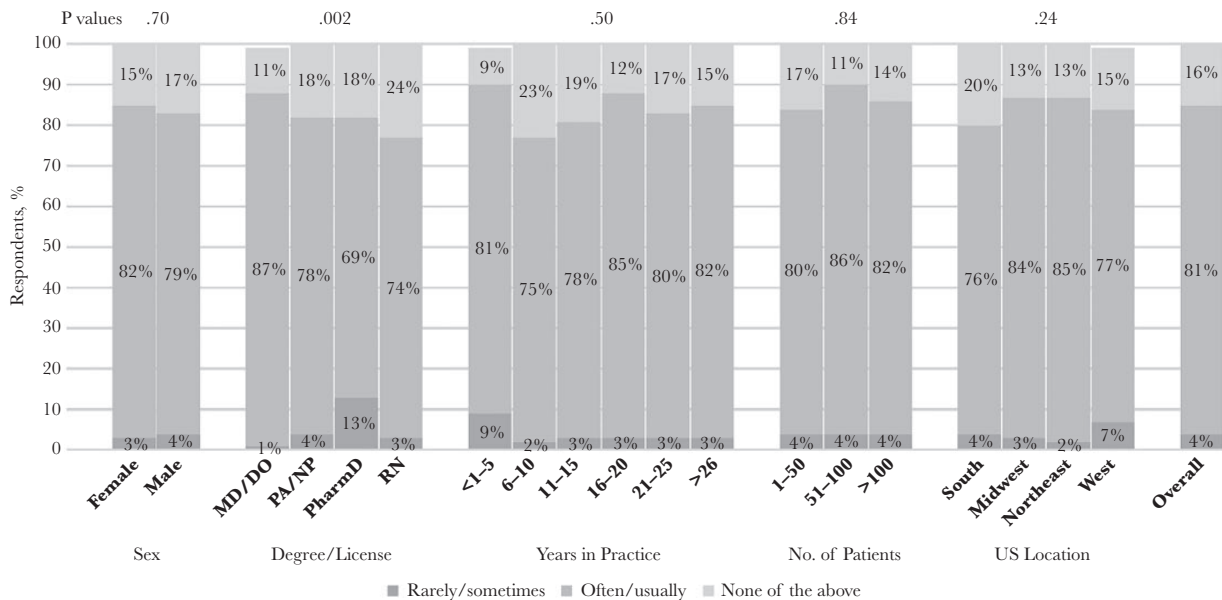


Figure 4. Practitioners' recommendations on condom use for patients receiving PrEP. Overall, 81% of respondents often or usually recommend condoms for patients receiving PrEP. Respondents overall were more likely to recommend condoms for patients receiving pre-exposure prophylaxis than for PWHvs (81% vs 76%). Practitioners with a PharmD degree were least likely to recommend condom use (69%).

very few believed that research into this subject was settled at the time of the survey completion. Although informal surveys at conferences and other venues have posed similar questions, there are no published data with which to compare our results. The findings are nonetheless intriguing in this moment of therapeutic equipoise and give some insight into how the HIV prevention data are being interpreted and applied to current clinical practice.

Supplementary Data

Supplementary materials are available at *Open Forum Infectious Diseases* online. Consisting of data provided by the authors to benefit the reader, the posted materials are not copyedited and are the sole responsibility of the authors, so questions or comments should be addressed to the corresponding author.

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