Correlates of Unprotected Sex Among Adult Heterosexual Men Living with HIV

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ABSTRACT *The correlates of unprotected sex among a sample of heterosexual men living with HIV (n = 121) were examined to determine whether patient characteristics can be used as a basis for tailoring safer sex counseling in the clinic setting. Potential correlates of self-reported unprotected oral sex (fellatio) and vaginal sex included participant demographics (e.g., age, ethnicity), disease status (CD4 counts, viral load, years since diagnosis), safer sex beliefs (e.g., condom attitudes), substance use, psychological characteristics (depressive symptoms, dispositional optimism and pessimism), and sex partner characteristics (main/casual partner, HIV status of partner, and duration of relationship). A series of logistic regression analyses were used to determine significant relationships. Correlates of reported levels of prior 3-month unprotected fellatio (24%) and vaginal (21%) sex were not associated with the type of relationship (main or casual) or perceived HIV serostatus of the partner (positive, negative, or unknown). Unprotected fellatio was positively associated with age and CD4 count and inversely associated with optimism and positive condom attitudes (all p 's < 0.05). Unprotected vaginal sex was positively associated with duration of relationship and inversely associated with positive condom attitudes. Prevention efforts among sexually active adult heterosexual men living with HIV may benefit from focusing on improving attitudes towards condom use regardless of partner relationship status.*

KEYWORDS *Condom attitudes, Heterosexual, HIV, Optimism, Unsafe sex.*

HIV prevention efforts have traditionally focused on people who were not currently diagnosed with HIV. However, many people living with HIV continue to have sex, some unprotected, leading to new infections. The Morbidity and Mortality Weekly Report entitled "Incorporating HIV Prevention into the Medical Care of Persons Living with HIV" (July 18, 2003) recommends that health care providers offer brief behavior risk-reduction interventions in the office or clinic setting and provide referrals of selected HIV-positive patients for additional prevention interventions and related services.¹

Recent provider based interventions have shown promise in reducing unprotected sex among people living with HIV, although the impact of these interventions may be limited by the characteristics of the patient.² This suggests that busy

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clinicians need to be able to quickly identify and appropriately tailor prevention counseling messages for their HIV-positive patients. More attention needs to be given to subgroups of patients in order to target interventions and design intervention approaches based on the characteristics of the sexual relationship(s) of the patients (e.g., whether the patient is in an exclusive main partner relationship, whether the patient has casual partners of unknown serostatus, whether the patient only has unprotected sex with other HIV+ patients).³⁻⁷

Heterosexually acquired HIV infections represented 35% of all new HIV cases for 1999–2002.⁸ Sixty-four percent of heterosexually acquired HIV infections occurred in females,⁸ and most women report the source of their infections to be from male sex partners. Although a large number of studies have examined psychosocial correlates of condom use among HIV negative men,⁹ relatively few have focused on sexual behaviors of heterosexual men living with HIV. These studies have examined injection drug use status,¹⁰ and gender¹¹ and reproductive¹² issues. Thus, the correlates and predictors of unprotected sex among HIV positive heterosexual men need further examination.

Cognitive and social-cognitive theories have been applied to understand the psychosocial factors associated with unsafe sex. Although many people living with HIV are aware of the harmful health effects of unsafe sex,¹³ a significant number continue to engage in unsafe sex.¹⁴ Perceptions of decreased sexual pleasure while using a condom and a condom's inefficacy in preventing HIV transmission contribute to disfavorable attitudes towards condoms that can ultimately impact safer sex behaviors.¹⁵⁻¹⁷

Safer sex negotiation skills are also associated with safer sex behaviors. Persons who are able to engage in and negotiate safer sex with a partner are more likely to use condoms and know how to use them correctly.¹⁸ Persons with decreased negotiation skills generally have a higher prevalence of risky sexual behaviors.^{16,19,20}

Because optimists generally expect positive outcomes, they should work harder and sooner at achieving these outcomes than pessimists. Thus, healthy behaviors are generally assumed to be positively associated with optimism. Among HIV-negative heterosexual samples, positive associations between optimism and safe sex behaviors have been observed.^{21,22} However, additional examination of this relationship is needed because in a study of homosexual men, optimism was inversely associated with safer sexual behaviors²³ and other studies among people living with HIV do not find a significant relationship between these variables.²⁴

Likewise, the relationship between depressive symptomatology and unsafe sex is not always consistent. Several studies find an association between depressive symptomatology and unsafe sex among HIV-positive samples.²⁵⁻²⁷ However, other studies do not find a significant relationship between these variables.^{14,28}

In the current study we examine potential correlates of unprotected oral (fellatio) and vaginal sex among 121 HIV positive men who reported being sexually active with a female partner in the prior three months. Fellatio is examined in addition to vaginal sex because it is a common behavior that can pose an increased risk of HIV transmission.²⁹ We specifically examine demographics (age, ethnicity, income), medical status (e.g., viral load, on/off antiretroviral therapy), sex partner relationship status (e.g., duration of relationship, partner HIV status), safer sex beliefs (e.g., attitudes towards condoms), and psychological status (e.g., optimism, depressive symptoms) to determine whether any of these factors may assist health care providers in determining the risk profile of their male HIV positive heterosexual patients.

MATERIALS AND METHODS

Participants

Data were collected at six HIV urban clinics in California as part of the Partnership for Health study. The details regarding the procedures of this intervention have been previously reported.^{2,30} The findings reported here are from the baseline questionnaire, which took place during 1998–1999. The six clinics were public and located in San Francisco, Santa Clara Valley, Los Angeles, Orange, and San Diego Counties. Interviewers implemented standardized selection and recruitment procedures using a screening questionnaire administered by the interviewer. Subjects were recruited who had tested seropositive at least three months prior to participation; were sexually active during the previous three months (mutual masturbation, fellatio, anal sex, or vaginal sex); and were 18 years of age and older. Procedures for the protection of human subjects were approved by the Institutional Review Boards (IRB) overseeing each clinic and by the IRB at the Centers for Disease Control. A total of 2,027 patients were approached to determine eligibility. Nine percent ($n = 187$) refused to be screened, and 562 were ineligible (88% of these were not sexually active in the past 3 months). Of the 1,278 who were eligible, 886 (69%) enrolled, and 392 were not recruited (primarily due to lack of time or refusal).

For the purposes of this study, we only included heterosexual men. Of the 886 patients enrolled, 130 were men who reported being sexually active with at least one woman in the prior 3 months. Because we were interested in examining the relationship between unprotected sex and specific sex partner characteristics, we excluded nine men who had multiple partners in the past 3 months. (That is, we preferred to examine partner status and type as independent groups whereas these participants would have contributed to more than one category if they were included.) Thus, the analytical sample included 121 male participants. None of these participants self-identified their sexual orientation to be homosexual/gay, ten identified as bisexual, and 111 identified as heterosexual/straight. Participants reported the most likely way they became infected was sex with a woman who was HIV positive (49.6%), shared needles or other injection paraphernalia with a person who was HIV positive (18.2%), or the possibility of either (12.4%). Data were collapsed across all clinic sites for the analyses because two of the clinics had very small cell sizes, which yielded unstable estimates.

Self-Report Measures

Demographics At baseline, self-reported demographics included age, ethnicity, and income. Income was determined from total household income for the previous year. Length of time since HIV diagnosis was also obtained through self-report at baseline.

Sex behavior measures focused on partner-specific sexual behaviors during the three months prior to the interview. Participants reported sex partner type as main, casual, or exchange. The definition of a main sex partner was, “Someone you had sex with and you were committed to even if that person was not your only sex partner.” A casual sex partner was, “Someone you had sex with to whom you did not feel committed,” and an exchange sex partner was “Someone you had sex with in exchange for things you needed or they needed, such as money, drugs, shelter or food.” Due to small numbers with exchange partners, these were combined with casual partners. Participants also reported their sex partner’s HIV status (i.e., HIV

positive, HIV negative, or unknown), duration of relationship, and whether they had disclosed their serostatus to their partner. Duration of relationship was log transformed for analyses. Participants completed a checklist to indicate specific sexual behaviors they engaged in with each partner and whether a condom was used. The primary variables for unsafe sex in the analyses included any instance of unprotected oral (fellatio) and vaginal sex in the prior 3 months.

Safer sex beliefs were assessed using a series of self-report items ascertaining safer sex knowledge and attitudes concerning safer sex effectiveness, pleasure, and negotiation. *Knowledge* regarding the harmful health effects of high-risk sexual behaviors was assessed using four items: 1) Getting infected with another strain of HIV would cause little additional harm to my health (reverse scored); 2) It would be more difficult to treat my HIV disease if I got another strain of HIV; 3) If my viral load is very low, I do not need to be concerned about infecting a person I have sex with, even if we have anal or vaginal sex without using a condom (reverse scored); and 4) Getting infected with a sexually transmitted disease would cause little additional harm to my health (reverse scored). Responses were made on a five-point scale, ranging from 1 (strongly agree) to 5 (strongly disagree) and a value of 3 as "don't know." Thus, higher values indicate disagreement on salutary behavioral beliefs. A final knowledge variable was created by using the mean of these four items (Cronbach's alpha 0.59). Attitudes concerning safer sex effectiveness, pleasure, and negotiation were assessed with items adapted from three subscales of the UCLA Multidimensional Condom Attitudes Scale.³¹ Attitude scores were created by using the mean of the respective items. *Effectiveness* items included 1) Condoms or other protection are an effective method for preventing the spread of HIV and other sexually transmitted diseases; 2) I think condoms or other protection are an excellent means of protection from HIV infection; 3) Condoms or other protection are unreliable (reverse scored). The Cronbach's alpha for this scale was 0.65. *Pleasure* items included 1) The use of condoms or other protection makes sex more stimulating; 2) Condoms or other protection ruin the sex act (reverse scored); 3) Condoms or other protection are uncomfortable for both partners (reverse scored). The Cronbach's alpha for this scale was 0.65. *Negotiation* items included 1) It is really hard to bring up the issue of condoms or other protection to my partner (reverse scored); 2) It is easy to suggest to my partner that we use condoms or other protection; and 3) I'm comfortable talking about condoms or other protection with my partner. The Cronbach's alpha for this scale was 0.77. Responses on these scales were made on five-point scales ranging from 1 (strongly agree) to 5 (strongly disagree). Thus, higher scores on these scales are indicative of greater negative attitudes towards the effectiveness, pleasure, and the negotiation use of condoms and other protection strategies.

Depression was ascertained with the Center for Epidemiological Studies Depression Scale (CES-D).³² The CES-D is a 20-item measure of current (i.e., past week) depressive symptoms (e.g., "I was bothered by things that usually don't bother me," and "I felt lonely"). Responses were made on a four-point scale, ranging from 0 (rarely or none of the time, less than 1 day) to 3 (most or all of the time, 5–7 days). Cronbach's alpha for this scale was 0.91.

Optimism/pessimism Consistent with research suggesting that the revised Life Orientation Test LOT-R³³ consists of two independent dimensions with separate optimism and pessimism subscales,³⁴ principal components analyses with varimax rotation clearly supported a two-factor solution among this sample. Thus, separate

scores were calculated for dispositional optimism and pessimism. The three-item optimism and pessimism subscales had four-point response formats ranging from “strongly agree” (1) to “strongly disagree” (4). Examples of items include “In uncertain times I usually expect the best” (optimism), and “I rarely count on good things happening to me” (pessimism). Cronbach’s alpha’s were 0.73 and 0.75 for the optimism and pessimism scales, respectively.

Heavy drinking (coded as yes/no) was defined as drinking five or more drinks on the same occasion on 12 or more days within the past 3 months. Previous 3-month *illicit drug use* was determined with a yes/no checklist of 12 substances (e.g., methamphetamines, crack cocaine) and was binary coded with one equaling use of any substance and zero equaling no-use. Marijuana use was not included due to the use of this substance for medical purposes. Current *antiretroviral therapy* was dichotomously coded, with one equaling use and zero equaling no use. *CD4 counts and viral load* were abstracted from medical charts. Viral load was log transformed for analyses.

Analysis

Our analyses examined unprotected fellatio and vaginal sex separately. We initially focused on the potential association between relationship characteristics and unprotected fellatio and vaginal sex by creating categories of patients based on the type (main or casual) and HIV serostatus of their sex partners. We utilized logistic regression for the main analyses. First, we examined univariate associations between all variables and unprotected fellatio and vaginal sex. Second, all variables that were significant at the $p < 0.10$ level by univariate analysis were entered into a multivariate logistic regression analysis. SAS, version 8.02, was used for all analyses.

RESULTS

Descriptive data regarding the sample are provided in Table 1. Participants were primarily low income (78% earned less than \$15,000 in the prior year) and ethnically diverse (44% were Hispanic, 28% were Black, and 28% were White). The mean age was 39.5 years ($SD = 8.4$). Twenty-nine participants (24.0%) had unprotected fellatio, and 26 participants (21.5%) had unprotected vaginal sex. Although these behaviors were strongly associated ($X^2(2) = 20.67, p < 0.001$), they were not entirely concordant. Fourteen (48.3%) of those who reported unprotected fellatio, did not report unprotected vaginal sex while 11 (42.3%) of those who reported unprotected vaginal sex did not report unprotected fellatio. Most participants reported having partners who were main (68%) and of negative (48.8%) HIV serostatus. However, there were no significant differences in levels of unprotected sex by partner type or serostatus (Table 2).

Univariate logistic regression results for unprotected fellatio indicated a significant negative associations for Hispanics (vs. Whites) and optimism and positive associations with age, years since HIV diagnosis, CD4 count, and negative attitudes towards the pleasure and effectiveness of condoms or other protection (Table 3). When these variables were included in a multivariate analysis, only age, CD4 count,

TABLE 1 Descriptive statistics of the sample (*n* = 121)

Characteristics (<i>n</i>)	%	Mean (SD)
Age (years)		39.5 (8.4)
Ethnicity		
White (34)	28.1	
Hispanic (53)	43.8	
Black (34)	28.1	
Income		
<\$15,000 (94)	77.7	
\$15,000+ (27)	22.3	
Education		
Less than high school (60)	49.6	
High school (34)	28.1	
More than high school (27)	22.3	
On antiretrovirals (98)	81.0	
Years since HIV diagnosis		5.0 (3.8)
Viral load (log)		6.1 (4.4)
CD4 count		378.9 (312.5)
Nondisclosure of HIV status (23)	19.0	
Partner status		
HIV positive (34)	28.1	
HIV negative (59)	48.8	
HIV unknown (28)	23.1	
Partner type		
Casual (39)	32.2	
Main (82)	67.8	
Duration of relationship (years)		4.1 (4.7)
Any illicit drug use (28)	23.1	
Heavy drinking (7)	6.0	
Depression		12.8 (11.5)
Optimism		10.6 (1.8)
Pessimism		5.9 (2.4)
Negative safer sex attitudes		
Knowledge		1.6 (0.8)
Pleasure		3.3 (1.1)
Effectiveness		1.5 (0.7)
Negotiation		1.5 (0.9)
Unprotected sex prior 3 months		
Unprotected fellatio (29)	24.0	
Unprotected vaginal (26)	21.5	

All variables are self-report with the exception of viral load and CD4 count, which were taken from medical records.

optimism, and negative attitudes towards the pleasure of condoms or other protection remained significantly associated with unprotected fellatio.

Univariate logistic regression results for unprotected vaginal sex indicated a significant negative association for Hispanics (vs. Whites), antiretroviral use, and optimism and positive associations with CD4 count, duration of relationship, pessimism, and negative attitudes towards the pleasure, effectiveness, and negotiation of condoms or other protection (Table 4). When these variables were included in a multivariate analysis, only duration of relationship and negative

TABLE 2 Proportion of participants who reported unprotected sex by partner type and HIV serostatus*

	Sex partner type and HIV status					
	Main partner			Casual partner		
	Positive	Negative	Unknown	Positive	Negative	Unknown
Unprotected fellatio	5/27 (18.5%)	13/46 (28.3%)	4/9 (44.4%)	1/7 (14.3%)	1/13 (7.7%)	5/19 (26.3%)
Unprotected vaginal sex	9/27 (33.3%)	9/46 (19.6%)	3/9 (33.3%)	1/7 (14.3%)	1/13 (7.7%)	3/19 (15.8%)

*n represents the number reporting unprotected sex/total in the category; none of the chi-square (by row) comparisons classifications had a *p* value less than 0.10.

attitudes towards the pleasure and negotiation of condoms or other protection remained significantly associated with unprotected vaginal sex.

DISCUSSION

This study found that among HIV positive sexually active heterosexual men, one-fifth report having unprotected fellatio or vaginal sex with their partners. Unprotected sex was primarily observed among participants holding negative attitudes regarding the pleasure (fellatio and vaginal sex) and negotiation (vaginal sex) in the use of condoms or other protection. These findings are consistent with prior research^{15,16} and suggest that interventions designed for heterosexual men living with HIV should focus on these particular condom attitudes. For example, providing scripts for patients to feel more comfortable talking about condoms with their partners may be helpful.

Neither partner HIV status nor type (main or casual) were associated with unprotected sex. This suggests that these partner characteristics did not play a role in these participant’s decisions to practice safe sex. However, 61.5% of those who reported unprotected vaginal sex had partners whose HIV status was negative or unknown. Further, the largest single strata of participants in this study had a main partner who was HIV negative or unknown, and between 19 and 33% of this group engaged in unprotected vaginal sex. Although our data do not describe in what context these relationships are initiated, they remain a concern as potential sources of new infections. These findings indicates that HIV prevention efforts that focus on serodiscordant couples need to be far-reaching.^{35–37}

Prevention interventions have been developed for persons who engage in sexual behaviors associated with transmission of HIV. For example, Padian et al.³⁵ addressed heterosexual serodiscordant couples in main partner relationships. This study found that a 1 h couple-counseling session had a significant impact on increasing abstinence (0 to 17%) and on increasing condom use among those who were not abstinent (49 to 88%). It is important to understand why serodiscordant couples engage in unprotected sex, whether it is due to misconceptions about infectivity, disinterest in condom use, or other cognitive or emotional barriers. Because duration of relationship was also found to be associated with unprotected sex, more stable relationships that are serodiscordant need prevention attention.

TABLE 3 Logistic regression analyses of any unprotected fellatio for the last 3 months

Characteristic	Univariate		Multivariate	
	OR	(95% C.I.)	AOR	(95% C.I.)
Age (years)	1.07	(1.02, 1.13)*	1.09	(1.02, 1.16)*
Ethnicity				
White	1.00		1.00	
Hispanic	0.27	(0.08, 0.62)**	0.77	(0.19, 3.01)
Black	0.44	(0.15, 1.25)	0.35	(0.08, 1.40)
Income				
<\$15,000	1.00			
\$15,000+	0.88	(0.32, 2.45)		
Education				
Less than high school	1.00			
High school	1.67	(0.63, 4.40)		
More than high school	1.40	(0.48, 4.07)		
On antiretrovirals	0.51	(0.19, 1.37)		
Years since HIV diagnosis	1.11	(0.99, 1.23)†	1.05	(0.91, 1.21)
Viral load (log)	1.02	(0.92, 1.12)		
CD4 count	1.00	(1.00, 1.00)†	1.00	(1.00, 1.00)*
Nondisclosure of HIV status	1.96	(0.73, 5.24)		
Partner status				
HIV positive	1.00			
HIV negative	1.45	(0.50, 4.22)		
HIV unknown	2.21	(0.68, 7.24)		
Partner type				
Main	1.00			
Casual	0.60	(0.23, 1.55)		
Duration of relationship (years)	1.05	(0.88, 1.27)		
Any illicit drug use	1.08	(0.40, 2.87)		
Heavy drinking	1.29	(0.24, 7.03)		
Depression	0.99	(0.95, 1.05)		
Optimism	0.75	(0.60, 0.94)*	0.71	(0.54, 0.94)*
Pessimism	1.02	(0.86, 1.21)		
Negative safer sex attitudes				
Knowledge	1.14	(0.67, 1.95)		
Pleasure	1.78	(1.14, 2.77)*	1.86	(1.11, 2.14)*
Effectiveness	1.81	(1.06, 3.27)*	1.44	(0.71, 2.89)
Negotiation	1.40	(0.93, 2.12)		

All variables are self-report with the exception of viral load and CD4 count, which were taken from medical records. The multivariate analysis only included variables that had significant ($p < 0.10$) univariate associations with unprotected fellatio.

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Although disclosure is often assumed to allow for easier negotiation of safer sex, these results and others^{38,39} suggest this may not be true. There was no association between disclosure and unprotected sex. However our data only look at disclosure when sexual relations occur, not when informed potential partners decline to engage in any sexual relations. Although fear and embarrassment might prohibit disclosure, counseling can increase disclosure to partners.⁴⁰

Dispositional optimism was associated with safer vaginal and oral sex in the univariate models and safer oral sex in the multivariable models. These findings add

TABLE 4 Logistic regression analyses of any unprotected vaginal sex for the last 3 months

Characteristic	Univariate		Multivariate	
	OR	(95% C.I.)	AOR	(95% C.I.)
Age (years)	1.03	(0.98, 1.08)		
Ethnicity				
White	1.00		1.00	
Hispanic	0.29	(0.08, 0.93)*	0.30	(0.06, 1.27)
Black	1.52	(0.54, 4.37)	1.87	(0.52, 7.23)
Income				
<\$15,000	1.00			
\$15,000+	0.39	(0.08, 1.24)		
Education				
Less than high school	1.00			
High school	1.53	(0.53, 4.38)		
More than high school	2.11	(0.71, 6.16)		
On antiretrovirals	0.42	(0.15, 1.15)†	1.16	(0.31, 4.74)
Years since HIV diagnosis	1.08	(0.97, 1.20)		
Viral load (log)	0.98	(0.88, 1.09)		
CD4 count	1.00	(1.00, 1.00)†	1.00	(1.00, 1.00)†
Nondisclosure of HIV status	0.73	(0.22, 2.36)		
Partner status				
HIV positive	1.00			
HIV negative	0.49	(0.18, 1.34)		
HIV unknown	0.66	(0.20, 2.10)		
Partner type				
Main	1.00			
Casual	0.43	(0.13, 1.16)		
Duration of relationship (years)	1.23	(0.97, 1.55)†	1.41	(1.08, 2.00)*
Any illicit drug use	1.30	(0.48, 3.50)		
Heavy drinking	1.29	(0.24, 7.03)		
Depression	1.01	(0.97, 1.06)		
Optimism	0.84	(0.67, 1.04)†	0.96	(0.69, 1.33)
Pessimism	1.21	(1.01, 1.45)*	1.18	(0.92, 1.54)
Negative safer sex attitudes				
Knowledge	1.36	(0.79, 2.34)		
Pleasure	1.90	(1.18, 3.05)**	1.92	(1.12, 3.59)*
Effectiveness	1.78	(0.97, 3.26)†	1.40	(0.64, 2.99)
Negotiation	1.59	(1.04, 2.42)*	2.08	(1.20, 3.86)*

All variables are self-report with the exception of viral load and CD4 count, which were taken from medical records. The multivariate analysis only included variables that had significant ($p < 0.10$) univariate associations with unprotected vaginal sex.

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

to a growing body of literature supporting the salutary health behavior profile of optimists. For example, prior research indicates that optimism is associated with other health promoting behaviors, such as diet and exercise,⁴¹ substance use avoidance,^{42,43} and paying attention to health risk information.^{44,45}

CD4 counts were associated with unsafe vaginal and oral sex in the univariate models and unsafe oral sex in the multivariable models. This may suggest that healthier persons are more likely to be unsafe. However, ART use, viral load, and

years since diagnosis were not associated with unsafe sex. Thus, it is unclear how disease status may influence safer sex behaviors.

There are a number of limitations to these results. The causality of these relationships are unknown because these data are cross-sectional. Because a primary outcome of the larger study was sex behavior, people who were sexually inactive were excluded from this study, and generalizing these results to sexually inactive heterosexual men living with HIV or other populations should be done cautiously. Although each clinic sample closely approximated the composition of their respective population in terms of gender and ethnicity, it remains unclear whether specific subgroups of people living with HIV refused to participate in this study, potentially influencing these observed results. In addition, because the alcohol and illicit drug use variables were assessed using single items, they may not have yielded reliable measurements. Thus, additional research is needed to replicate these findings.

We have suggested a prevention protocol for providers treating people living with HIV.⁴⁶ The first level involves brief safer sex counseling of all patients during clinic visits by health care providers. This counseling was associated with a reduction in unsafe behavior among patients with riskier behavioral profiles.² This can also help providers identify the serodiscordant couples who engage in unprotected sex and refer them for couple counseling. Providers can also identify patients who have multiple partners or casual partners and engage in unsafe sex, and these patients can be referred to more intensive counseling such as that tested by Kalichman et al.⁴⁷ or by Patterson et al.⁴⁸ These types of interventions may be most appropriate for changing condom attitudes.

Health care providers are encouraged to offer brief interventions in the office or clinic setting to reduce risky sexual behaviors and to make referrals for patients who require more in-depth prevention interventions,¹ and data from different populations are needed to optimize these interventions. This study suggests that among heterosexual men living with HIV, negative safer sex attitudes are associated with unprotected sex behaviors. Interventions are likely to be most effective if they target these attitudes, particularly among longer term relationships where levels of unprotected sex are higher and among serodiscordant relationships where the risk of transmission is of greater concern.

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