Published in final edited form as:

AIDS Behav. 2014 September ; 18(9): 1808–1819. doi:10.1007/s10461-014-0782-3.

Positive Choices: Outcomes of a Brief Risk Reduction Intervention for Newly HIV-diagnosed Men who have Sex with Men

Kathleen J. Sikkema^{1,2}, Laurie Abler², Nathan B. Hansen³, Patrick A. Wilson⁴, Anya S. Drabkin¹, Arlene Kochman², Jessica C. MacFarlane², Allyson DeLorenzo², Gal Mayer⁵, Melissa Watt², and William Nazareth⁵

¹Duke University, Department of Psychology and Neuroscience, Durham, NC

²Duke University, Duke Global Health Institute, Durham, NC

³University of Georgia, Department of Health Promotion and Behavior, Athens, GA

⁴Columbia University, Mailman School of Public Health, Department of Sociomedical Sciences, New York City, NY

⁵Callen-Lorde Community Health Center, New York City, NY

Abstract

Positive Choices (PC), a brief sexual risk reduction intervention conducted with newly HIV-diagnosed men who have sex with men (MSM), was evaluated for preliminary efficacy. Participants were enrolled if they reported unprotected anal intercourse (UAI) in the three months prior to HIV diagnosis (n=102). Three months after diagnosis, participants completed baseline assessments and were randomly assigned to receive the 3-session PC intervention or the comprehensive standard of care (C-SoC) at a community health center. Participants completed assessments at 3-(post intervention), 6-, and 9-months after baseline. Compared to C-SoC participants, PC participants significantly reduced the frequency of UAI with HIV serodiscordant (HIV negative or status unknown) partners over the 9-month follow-up period. No differences by condition were found in the frequency of UAI with all partners. The findings from this trial suggest that brief risk reduction approaches for newly-diagnosed MSM integrated into HIV care can benefit secondary HIV prevention efforts.

Keywords

HIV positive; MSM; intervention; HIV prevention; new HIV diagnosis; RCT

INTRODUCTION

Men who have sex with men (MSM) account for approximately half of the HIV cases in the United States (1) and comprise over half of the annual incident infections (2). HIV

infections have risen annually among MSM, but not other risk groups (3), particularly in ethnic minority and younger MSM (4). Between 2008 and 2010, new diagnoses grew among MSM by 12% (5). At the same time, rates of transmission risk behaviors (6, 7) and sexually transmitted infections (8, 9) have increased, further demonstrating the need to focus prevention efforts on this population.

Secondary prevention (or “positive prevention”) is a key strategy to address the HIV epidemic, particularly among HIV-infected MSM (10). However, behavioral interventions show modest to mixed effects at reducing risk behaviors among people infected with HIV and stopping the onward transmission of HIV (11, 12). The effectiveness of behavioral interventions that address positive prevention can be enhanced by integrating them into health care settings (13–15). In addition, the impact of behavioral interventions may be improved by focusing on recently-diagnosed MSM rather than in the later stages of living with HIV (16).

The period following HIV diagnosis provides a unique window of opportunity for intervening on sexual transmission risk behaviors. Following diagnosis, a substantial portion of MSM continue to engage in unprotected anal intercourse (UAI) (17). For many newly-diagnosed MSM, counseling and testing (18, 19) and the impact of diagnosis (20) lead to reductions in UAI, but after a short period, risk behavior often rebounds to levels demonstrated prior to diagnosis (21). In fact, more than half of HIV positive MSM report unprotected intercourse within one year of diagnosis (17, 19, 22). Some studies have shown that recently diagnosed MSM engage in more sexual risk behaviors compared to MSM who have known their HIV positive status longer (16, 23). To maintain reductions in risk behavior in the period following diagnosis, the standard of care post-test counseling should be coupled with strategies that continue to address sexual risk behaviors in the months following an HIV diagnosis.

Although post-test counseling may reduce UAI among some newly-diagnosed MSM, this counseling results in modest effects (18, 19) that are difficult to discern from the impact of diagnosis itself (24). An HIV diagnosis can heighten anxiety and emotional distress, making information related to emotional support and referrals more salient at this time than information related to long-term behavior change (25). At the time of HIV diagnosis, delivering risk-reduction counseling, compared to delivering information, provides no additional benefit for impacting sexual risk behaviors and incidence of sexual transmitted infections (26). Relying only on the post-test counseling session to address behavior change, without further follow-up, may be a missed opportunity to develop the information, skills, and behavior necessary for reducing transmission risk while living with HIV (12).

After adjusting to the initial distress of the HIV diagnosis, a “teachable moment” may emerge in which the newly-diagnosed individual is open to learn and use information and skills related to self-care and risk reduction. Teachable moments are events that increase perceptions of risk, prompt strong affective and emotional responses, and redefine ones self-concept or social role, such as after health-related events like disease diagnosis (27). During this time, brief interventions can significantly impact complex behavior because people are at an increased state of readiness for change. Selecting appropriate behavior change skills on

which to intervene requires careful attention to the needs of the population of interest (28) (i.e., newly-diagnosed MSM). During the teachable moment, newly-diagnosed individuals may be receptive to behavior change guided by the Informational-Motivational-Behavioral Skills model (29) and the Transtheoretical model (30, 31) which help individuals cope with the HIV diagnosis and reduce risk behaviors depending on their readiness for change. These skills include knowledge, motivation, behavioral intentions, self-efficacy, risk reduction decision-making, self-regulation, and communication. Brief interventions that incorporate relevant behavior change skills can thus influence sexual risk behaviors after HIV diagnosis (32), when MSM are redefining themselves as living with HIV and motivating themselves to develop patterns of safer sex behaviors (19).

The impact of the teachable moment may be maximized by integrating secondary prevention efforts into the HIV care setting. As newly-diagnosed MSM seek care and develop relationships with providers in the HIV care setting, this opportunity serves as an influential period to address behaviors related to sexual risk and health care. Improving how HIV-infected patients interact with their HIV care providers leads to sexual risk reduction (33). These patient-provider interactions have the added benefit of improving “treatment as prevention” efforts by enhancing linkages and engagement in care (34–36). Treatment as prevention is an approach that provides antiretroviral therapy (ART) to people infected with HIV in order to suppress their viral load and decrease their transmission risk with sexual partners (37). Treatment as prevention strategies can successfully reduce HIV transmission when HIV-infected individuals are engaged across the continuum of care (38). However, these strategies can only occur if the critical link between an HIV diagnosis and engagement in HIV care is made (39). Secondary prevention interventions that occur within the health settings may serve to fill this gap (36, 40).

Few, if any, interventions have addressed sexual risk reduction among MSM during the critical period following HIV diagnosis and initial engagement in care. In this study, we evaluate whether Positive Choices (PC), a brief risk reduction intervention for newly-diagnosed MSM in HIV care, reduced sexual risk behavior in the year following HIV diagnosis. Behavioral interventions integrated into the care setting, such as PC, have the potential to create long-lasting sexual risk reductions that stop the onward transmission of HIV.

METHODS

Participants and setting

Newly HIV-diagnosed patients were recruited between June 2009 and May 2011 from a Federally Qualified Health Center in New York City that specializes in care for lesbian, gay, bisexual and transgender communities. Patients were eligible if they met the following criteria: 1) HIV diagnosis within the past three months; 2) English fluency; 3) UAI with a male partner in the three months prior to HIV diagnosis; 4) 18 years or older; 5) identified as male sex at birth (regardless of current gender identity); and 6) were accessing health care services at the study health center.

Procedures

All study procedures were approved by the institutional review boards at each participating institution. Recruitment brochures were distributed at the health center, and care providers informed HIV positive patients about the study either upon receipt of diagnosis or during the first clinic visit post-diagnosis. Patients who were within three months of learning their HIV diagnosis provided written informed consent and were screened to determine study eligibility (41). Patients who met eligibility criteria were scheduled to complete a baseline assessment three months following HIV diagnosis, after which participants were randomly assigned to the experimental intervention condition (PC) or the comprehensive standard of care (C-SoC) control condition. Participants completed additional assessments at 3-(post intervention), 6-, and 9-months after baseline to comprise a one year study period. During all assessments, demographic and psychosocial constructs were measured using a computer assisted self-interview (CASI) and detailed sexual behavior was assessed using an interviewer-administered time-line follow-back (TLFB) instrument (42). Each assessment visit lasted approximately 60 minutes, and participants were remunerated \$35 for each visit. Electronic medical records were reviewed to extract data on clinical factors related to HIV care and treatment outcomes.

Figure 1 describes the flow of participants through the study. Of the 150 patients who completed the screening, 119 (79.3%) met eligibility criteria for the study. Of the eligible patients, 102 (85.7%) enrolled, completed the baseline assessment, and were randomly assigned to either the intervention or control condition. There was no significant difference by study condition in the percentage of participants lost to follow-up. Participants who were lost to follow up did not significantly differ by study condition on any of the baseline study measures (demographic factors and sexual risk behaviors) compared to retained participants.

Study conditions

Positive Choices (PC) Intervention—The content of the three-session intervention was developed through community-based collaboration, and incorporated components of the Information-Motivation-Behavioral skills model (29) and the Transtheoretical model (30). PC was delivered by HIV counselors at the health center, who had substantial experience and/or received counseling and testing certification from the Department of Health. The HIV counselors were trained by the study coordinator to facilitate the intervention using a detailed intervention manual, a counselor workbook, and role plays, and received ongoing supervision to enhance fidelity to the intervention. PC capitalized on the skills and knowledge of HIV counselors, aimed to make risk reduction a central issue from the outset of treatment, and integrated risk reduction and health promotion with the medical treatment plan soon after receiving the HIV diagnosis. The primary goal of the intervention was to reduce HIV transmission behavior through enhancing risk reduction decision-making and disclosure skills, assisting participants in the transition into HIV care, and promoting positive attitudes toward risk reduction.

Intervention sessions lasted approximately 60 minutes. The first session (“Risk Reduction Plan”) addressed the sexual health of newly-diagnosed MSM and the development of a sexual risk reduction plan specific to the participant’s current stage of coping with his

diagnosis. The discussion was tailored to address the participant's health status, care and treatment plan, and health priorities established after the first medical visit (e.g., sexually transmitted infections, high viral load). The second session ("Disclosure of Serostatus") focused on disclosure decision making, enhancing communication skills, and setting achievable disclosure goals. The third session ("Protecting Sexual Health") reviewed the materials from sessions 1 and 2, and functioned as a booster to improve risk reduction strategies regarding health overall, treatment-related concerns, and maintenance of risk reduction strategies. All sessions included interactive tasks such as self-assessment handouts to guide session content and progress, exercises to tailor goals to the stage of readiness for behavior change and increase motivation, self regulation skills for sexual and substance use risk reduction plans, and role plays for enhancing decision-making and communication skills. A detailed description of the PC intervention, how it was created using formative research and pilot intervention activities, and its high levels of feasibility and acceptability among counselors and participants has been published elsewhere (43).

Participants randomized to the PC condition received the three intervention sessions. The first two sessions occurred in consecutive weeks following the baseline assessment, and the third session occurred one month later. After each session, counselors completed a detailed quality assurance worksheet to document fidelity to the intervention content, skills and activities. The assurance worksheets were reviewed by the study coordinator, who also held supervisory meetings with the counselors on a regular basis. The counselors' adherence to the PC protocol was high, with all of the intervention components covered in the course of the three sessions. While most participants (76%) attended all three sessions, 8% attended only one or two sessions, and 16% attended no intervention sessions. Participants were retained in the study regardless of intervention exposure, following an intent-to-treat analysis of the outcomes.

Comprehensive Standard of Care (C-SoC)—The C-SoC control condition participants received no active intervention content from the study. Instead, the C-SoC participants were offered a variety of HIV-related support services provided through the health center's comprehensive standard of care for newly-diagnosed individuals. All participants had regularly scheduled appointments with clinic providers (nurses, case managers, physicians, adherence nurse); referrals to mental health, psychiatric, and substance use providers (available at the health center as well as outside referrals); and the option to participate in support groups for newly HIV-diagnosed individuals. The C-SoC services were also available to PC participants.

Measures

Demographic, sexual relationship status, and HIV-related health

characteristics—Demographic variables assessed during the screening visit included age, gender identity (male, transgender female), race/ethnicity, income, employment status, sexual orientation, and education. Sexual relationship status (having a primary partner and number of sexual partners) in the three months following diagnosis (baseline) was extracted from the TLFB data to characterize the sample. HIV viral load, CD4 count, and ART prescription at the time of diagnosis were abstracted from participants' medical records at

the health center. The variables for viral load (<100,000, 100,000) and CD4 count (<350, >350) were dichotomized and also examined continuously.

Intervention acceptability—The acceptability of the intervention was evaluated using a series of six questions about participants' experiences with the intervention (e.g., "the sessions' content was helpful in my formulating a risk reduction plan," "I would recommend this program to newly-diagnosed individuals," and "I felt supported as a newly-diagnosed HIV person"). Following the conclusion of the third intervention session, PC participants rated their responses on a four-point Likert scale (1=strongly disagree to 4=strongly agree). A mean score was calculated with higher values indicating greater intervention acceptability (alpha=0.87).

Sexual behavior—At each assessment, the TLFB instrument was used to collect detailed information on sexual behaviors over a three-month recall period. Study staff, each of whom held master's degrees in social work and had at least five years of HIV prevention experience, presented a calendar for the previous three months, reviewed key events and dates as recall aids, and asked participants to identify days when they were sexually active. The TLFB was event-based, focusing on sexual occasions rather than practices with specific partners. For every day that the participant noted sexual activity on the calendar, the staff asked a series of questions to obtain further details about the occasion, including: 1) the HIV serostatus of the partner (positive, negative, or unknown); 2) the type of partner (primary or secondary); 3) whether the intercourse was anal and/or oral; 4) whether the sex was protected with a condom or unprotected; and 5) whether the intercourse was insertive, receptive or both. Staff recorded a participant's responses directly onto the TLFB calendar and after completion of the interview, coded the information into an electronic database.

Two outcome measures were developed using the TLFB data at baseline, 3-, 6-, and 9-month assessments. The outcome measure for unprotected anal intercourse (UAI) was calculated as the total number of unprotected insertive or receptive anal intercourse occasions in the previous three months with any partner. The outcome measure for UAI with serodiscordant partners (UAI-SD) was defined as the number of unprotected insertive or receptive anal intercourse occasions in the previous three months with serodiscordant partners (HIV-negative or unknown serostatus). The TLFB measure has been demonstrated to be a reliable measure of sexual behavior over a 3-month retrospective period (42).

Data analysis

Descriptive analyses were conducted to examine the baseline characteristics of the total sample and by study condition. The two conditions were compared based on demographic factors, relationship status, and health characteristics. T-tests were used to compare continuous variables; chi-square tests and Fisher's exact tests were used to compare categorical variables. A two-sample test of equal proportions was calculated to determine if the drop-out rate differed by condition or by baseline risk behavior, and no differences were found.

To assess the changes in the frequency of the UAI and UAI-SD outcomes by condition, we employed generalized linear mixed modeling (GLMM) using the PROC GLIMMIX

procedure in SAS (SAS Institute, Inc, Cary, NC). Because the outcomes were measured repeatedly, GLMM was used to examine the longitudinal random and fixed effects by testing the difference in the rate of occurrence of the outcome between the two conditions over time. This approach allows the value at baseline (the intercept) and the rate of change over time (the slope) of the outcomes to vary across participants and uses full information maximum likelihood estimation on all the data available for each participant. Therefore, the GLMM included the participants randomized into each condition regardless of the number of assessments completed.

Two longitudinal models were conducted separately for the UAI and UAI-SD outcomes and fitted to a negative binomial distribution to account for the overdispersion in the count outcomes. Each model contained three independent variables: 1) time of the assessment, with baseline as the reference; 2) the intervention condition; and 3) a time by condition interaction term. The adjusted mean counts for the UAI and UAI-SD outcomes by condition were calculated from the longitudinal models to characterize the patterns of change over the study period. A post-hoc analysis was conducted to explore the UAI and UAI-SD outcomes by partner type. Four models were examined – UAI with primary partners, UAI with secondary partners, UAI-SD with primary partners, and UAI-SD with secondary partners. Depending on the outcome, the sample sizes differed. For models with a UAI outcome, the entire sample was used (n=102). For models with a UAI-SD outcome, analyses were restricted to a subsample of participants who reported any sex with an HIV negative or HIV unknown status partner during the study period (n=80).

The effect sizes were calculated for the 3-, 6-, and 9-months follow-up assessments using Cohen's *d* (44, 45) to examine the relative impact of the PC condition on the outcomes compared to the C-SoC condition. PROC GLIMMIX produced the estimated means and standard errors necessary to calculate the effect sizes.

RESULTS

Sample characteristics at baseline

Characteristics of the sample were balanced between treatment conditions Table 1, with a mean age of 32.2 years (SD=8.8). Most (73.3%) participants earned under \$30,000 per year, were currently employed or a student (66.7%), and had at least some college education (78.4%). The sample was ethnically diverse. Nearly all (95.1%) participants identified as either gay or bisexual, and 100% reported having only male sexual partners over the study duration. The sample included four transgender participants who identified as female. More than a third (40.2%) of the participants reported having a primary partner and on average had 4.3 (SD=5.6) sexual partners in the three months after diagnosis. Based on the initial medical report post diagnosis, over a quarter of the sample (27.5%) was taking ART, 14.1% had an elevated viral load (>100,000 copies/ml), and 30.8% had a CD4 count below 350 cells/ μ l.

Intervention acceptability

Over two thirds ($n=36$) of the participants in the PC intervention arm completed the assessment of intervention acceptability. The mean score for intervention acceptability was 3.47 ($SD=0.47$), which represents high levels of acceptability.

Longitudinal intervention effects on UAI and UAI-SD

The parameter estimates in Table 2 indicate that there were no significant differences in the frequency of UAI ($\beta_{\text{condition}} = -0.16$, $F_{(1,125)} = 0.25$, $P = 0.62$) or UAI-SD ($\beta_{\text{condition}} = 0.89$, $F_{(1,103)} = 3.02$, $P = 0.09$) between the conditions at baseline. The parameter estimates for the time variable suggest that the mean frequency of the UAI ($\beta_{\text{time}} = -0.14$, $F_{(1,125)} = 0.78$, $P = 0.38$) and UAI-SD ($\beta_{\text{time}} = 0.05$, $F_{(1,103)} = 0.04$, $P = 0.84$) occasions did not change significantly over time during the course of the study. Lastly, the time by condition interaction was not significant for the UAI outcome ($\beta_{\text{time*condition}} = 0.19$, $F_{(1,125)} = 0.67$, $P = 0.41$), meaning that no significant differences occurred by condition for the changes in the rate of UAI frequency over time. However, a significant time by condition interaction was observed for UAI-SD occasions ($\beta_{\text{time*condition}} = -0.73$, $F_{(1,103)} = 4.63$, $P = 0.03$), indicating that participants in the PC condition decreased their frequency of UAI-SD over the course of follow-up at a greater rate than those in the C-SoC condition.

Table 3 presents the adjusted means and standard errors (SE) for UAI and UAI-SD by condition at baseline, 3-, 6-, and 9-month assessments. Graphs of the adjusted mean UAI and UAI-SD counts by condition over the study period are depicted in Figure 2 and 3. For UAI with all partners (Figure 2), the PC intervention participants reported an initial decrease in UAI occasions from baseline to 3-months follow-up, immediately following the delivery of the PC intervention. Using a standardized effect size calculation to determine the difference between the adjusted mean frequencies of UAI at each assessment point, the PC intervention condition demonstrated moderate effects (44) in reducing the frequency of UAI compared to the control condition at 3-months ($d = 0.34$). However, this reduction in UAI was not maintained at 6- and 9-months compared to the control condition ($d = -0.08$ and -0.21 , respectively).

Compared to the UAI outcome, the UAI-SD outcome across the two conditions followed a different pattern (Figure 3). Participants in the PC intervention condition reported a consistent decrease in UAI-SD occasions (UAI with HIV negative or unknown serostatus partners) from baseline throughout the study follow-up. In contrast to PC participants, reports of UAI-SD in the control condition increased from baseline to 3-months, decreased at 6-months, and then increased at 9-months. When comparing the adjusted mean frequency of UAI-SD by condition using the effect size calculation, the PC intervention showed moderate effects at 9-months ($d = 0.28$), but no intervention effects were seen at earlier (3- and 6-month) follow ups when C-SoC participants reported similar levels of UAI-SD compared to PC participants ($d = -0.03$ and -0.11 , respectively).

Exploratory analysis of intervention effects by partner type

Even though the small number of participants suggests that power is insufficient to find differences that may exist, a post-hoc analysis was conducted on four longitudinal models to

test whether there were any intervention effects for the UAI and UAI-SD outcomes by partner type (primary, secondary). Of the four outcomes that were tested (UAI with primary partner, UAI with secondary partner, UAI-SD with primary partner, and UAI-SD with secondary partner), significant intervention effects were found for UAI-SD with secondary partner. These effects ($\beta_{\text{condition}} = 1.28$, $F_{(1,103)} = 4.98$, $P = 0.03$; $\beta_{\text{time}} = 0.15$, $F_{(1,103)} = 0.31$, $P = 0.58$; $\beta_{\text{time*condition}} = -0.75$, $F_{(1,103)} = 4.06$, $P = 0.047$) suggest that PC participants, compared to C-SoC participants, significantly reduced their frequency of UAI-SD with secondary partners over time.

DISCUSSION

Positive Choices (PC), a brief risk reduction intervention for newly-diagnosed MSM evaluated for preliminary efficacy, was shown to reduce the frequency of UAI with HIV negative or serostatus unknown partners (UAI-SD) over the year following HIV diagnosis. A reduction in UAI overall occurred at three months post-intervention, but not at other follow up points. The reduction in UAI-SD among those in the PC intervention lasted over 9 months of follow-up, showing that the participants continued decreasing their transmission risk behaviors in the period following intervention delivery. Exploratory analyses suggest these reductions in UAI-SD may have been occurring among PC participants with their secondary partners. These UAI-SD reductions are notable, given the high levels of sexual risk behavior prior to diagnosis that were reported by the sample of patients screened for inclusion into the PC intervention trial (41). Behavior change is difficult to initiate and maintain, and those with the highest risk may face significant barriers to behavior change. These results provide evidence that a brief risk reduction intervention, integrated into the clinical care setting, can be efficacious among newly-diagnosed MSM to reduce the sexual behaviors that may increase the transmission of HIV.

During the follow-up period, PC participants maintained the overall frequency of UAI occasions while reducing UAI-SD occasions, suggesting that participants may have used serosorting (i.e., avoiding UAI with serodiscordant partners) as a risk reduction strategy. Serosorting provides both advantages and disadvantages to sexual health and wellbeing. As an advantage, serosorting is a harm reduction approach for protecting oneself and one's partners once diagnosed with HIV. MSM may utilize serosorting in order to avoid stigma and rejection, disclosure to a serodiscordant partner, and condom fatigue (46–49). A further advantage is that primary HIV transmission cannot occur between partners who are both HIV positive, thus preventing new cases of HIV (50). However, as a disadvantage, serosorting is not as protective against STIs as consistent condom use (51, 52), and acquisition of an STI can negatively impact viral load, increase disease progression, and negatively affect the efficacy of antiretroviral treatment in HIV positive individuals (53, 54). Moreover, serosorting may be ineffective, as studies have shown that some HIV positive MSM may assume that a partner is HIV positive without confirming serostatus (55, 56). The reductions found in UAI-SD may be attributable to PC intervention content related to serostatus disclosure, skills for communication regarding partner serostatus, the role of substance use in risk behavior, and adaptive coping related to HIV diagnosis. Serosorting may be due to social and community norms, endorsement of “positive sexuality,” or an increased appreciation for preventing HIV infection.

Based on evidence from a meta-analysis of positive prevention interventions conducted with people living with HIV, behavioral interventions typically have limited lasting effect, if any, on reducing sexual risk behaviors (11). Successful positive prevention interventions have had greater length and intensity (57), been integrated into medical care (58) or provided motivation and skills for risk reduction (59). However, none of the interventions highlighted in the meta-analysis (11) or published since (15, 59–63), have focused on the critical window of opportunity following HIV diagnosis. Targeting this period when people are motivated to work with their care providers to change health behaviors (27, 64), may maximize the receptiveness of HIV positive MSM to making long-lasting reductions in transmission risk behaviors following diagnosis. Without intervention, any initial reduction in sexual risk behaviors as a result of diagnosis is often followed by a rebound to the levels of risk seen prior to diagnosis (65). During the first three months following diagnosis, most of the sample had not initiated ART. Prior to initiating treatment, sexual risk reductions, such as those facilitated by PC, are especially important for preventing HIV transmission when “treatment as prevention” benefits are not yet available. PC capitalized on this important period by delivering the risk reduction sessions three months after diagnosis, allowing participants time to adjust to their HIV diagnosis before becoming engaged in the intervention and prior to returning to pre-diagnosis risk levels.

In addition to the timing of the intervention, PC consisted of theoretically-based behavior change techniques to address motivation and behavioral skills tailored to individuals’ readiness for risk reduction. The behavior change techniques included self-assessments, motivational interviewing, goal setting, and role plays and practice, which were used to build self-efficacy, behavioral skills, self-regulation, reinforcement, and social support. Given the brevity of the intervention, these approaches were centered around providing relevant medical information for newly-diagnosed MSM, increasing motivation and engagement in the treatment process, and increasing self-efficacy and decision-making related to disclosure, communication, and risk reduction.

The PC intervention was not only integrated into the HIV care setting soon after diagnosis, but was also intended to seamlessly blend risk reduction and medical care while fostering a positive attitude toward sexuality. To deliver the intervention sessions, this study utilized HIV counselors already employed at the study clinic to provide testing and counseling, and was integrated into HIV primary care. Thus, the potential reach and uptake of PC in other HIV care settings is enhanced by working with pre-existing clinic staff. The efforts to integrate PC into the care system at the study clinic likely normalized patient-provider discussions about sexual behavior, contributing to the intervention’s efficacy. Given recommendations to improve patient retention across the continuum of HIV care (66), the rapport that develops as a result of providers discussing sexuality and risk behavior within the context of health care may also benefit patients’ engagement in HIV care (67). In addition, integrating secondary prevention early into HIV care for newly-diagnosed individuals may: 1) increase access to ART, adherence, and virologic suppression, reducing the biologic risk of HIV transmission; and 2) retain MSM in care, reducing the drop-off from the continuum of HIV care once they have successfully been linked to care. Less than half of MSM who know their status are retained in care (68). Barriers to care engagement for MSM include lowered appointment expectations (69), provider stigma (70), and poor

provider relationships and communication (67). The PC intervention was developed to help participants surmount these barriers by providing a supportive context for obtaining care from the outset of living with HIV (43). Therefore, an additional benefit of PC beyond reductions in UAI-SD may be increased engagement in care. Future large-scale trials that assess behavioral and biological indicators of risk and engagement in care (e.g., assessments of viral load, incipient STIs, etc.) are needed to further explore the potential for care-based risk reduction interventions to enhance retention and engagement in care.

The study has potential limitations. First, because of the high levels of risk behavior reported by the population of MSM recruited and enrolled from one health center, the findings may not be generalizable to MSM with different risk profiles in different settings. Second, there was substantial participant drop-out over time, albeit equally by study condition and by the sexual risk behaviors reported at the time of diagnosis. Attrition levels were due, in part, to a study protocol decision to include only participants who received care at the community health center. Of those who did not complete all assessments, 35% were lost to follow-up because they left care at the community health center, whether they dropped out of HIV care completely or transferred care to a different clinical setting. Future studies may consider following participants regardless of care setting. Third, this study used self-reported outcome data. Participants may have incorrectly assumed the serostatus of their sexual partners (50, 71) and a large number of unknown serostatus partners may have in fact been HIV positive. However, since partner serostatus was unknown, it suggests the occurrence of risk behavior. Despite the limitations to self-reported sexual behaviors, the use of TLFB administered by trained staff aided participants in recalling a detailed sexual history and strengthens the reliability of the data (42). Fourth, a potential threat to internal validity is that the study did not use blinded treatment assignment, which may have resulted in differential responses to the TLFB by condition.

In conclusion, the PC brief risk reduction intervention, delivered to MSM soon after HIV diagnosis and integrated into the community health center where MSM received their HIV care, provided the means to reduce the sexual behaviors that may increase risk of HIV transmission. The individualized risk reduction strategies developed by participants with guidance from HIV counselors integrated in the study clinic allowed the session content to address the unique needs of each participant. In response to the recent increases in the incidence of HIV among MSM, coupled with the CDC testing guidelines intended to increase the identification of HIV positive MSM (72), interventions like PC that impact risk reduction in the critical period following diagnosis are essential for addressing the HIV epidemic among MSM.

Acknowledgments

This research was funded by the NIH grant R01-MH078731. We are grateful for our longstanding collaboration with Callen-Lorde Community Health Center and the individuals who offered their participation in the study. In addition, we acknowledge the Duke Center for AIDS Research (NIAID P30-AI064518) for the support in the conduct of this study and preparation of the manuscript.

REFERENCES

1. Centers for Disease Control and Prevention. [cited 2013 September 3] HIV among gay and bisexual men. 2013. Available at: <http://www.cdc.gov/hiv/topics/msm/pdf/msm.pdf>.
2. Hall HI, Song R, Rhodes P, et al. Estimation of HIV incidence in the United States. *JAMA*. 2008; 300(5):520–529. [PubMed: 18677024]
3. Sullivan PS, Salazar L, Buchbinder S, Sanchez TH. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS*. 2009; 23(9): 1153–1162. [PubMed: 19417579]
4. Prejean J, Song R, Hernandez A, et al. Estimated HIV incidence in the United States, 2006–2009. *PLoS One*. 2011; 6(8):e17502. [PubMed: 21826193]
5. Centers for Disease Control and Prevention. Estimated HIV incidence in the United States, 2007–2010. HIV Surveillance Supplemental Report. 2012
6. van Kesteren NM, Hospers HJ, Kok G. Sexual risk behavior among HIV-positive men who have sex with men: a literature review. *Patient Educ Couns*. 2007; 65(1):5–20. [PubMed: 17098392]
7. Seng R, Rolland M, Beck-Wirth G, et al. Trends in unsafe sex and influence of viral load among patients followed since primary HIV infection, 2000–2009. *AIDS*. 2011; 25(7):977–988. [PubMed: 21358375]
8. Heffelfinger JD, Swint EB, Berman SM, Weinstock HS. Trends in primary and secondary syphilis among men who have sex with men in the United States. *Am J Public Health*. 2007; 97(6):1076–1083. [PubMed: 17463387]
9. Leichter JS, Haderxhanaj LT, Chesson HW, Aral SO. Temporal trends in sexual behavior among men who have sex with men in the United States, 2002 to 2006–2010. *J Acquir Immune Defic Syndr*. 2013; 63(2):254–258. [PubMed: 23466645]
10. Centers for Disease Control and Prevention. Advancing HIV prevention: new strategies for a changing epidemic—United States, 2003. *MMWR*. 2003; 52:329–332. [PubMed: 12733863]
11. Crepaz N, Lyles CM, Wolitski RJ, et al. Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. *AIDS*. 2006; 20(2): 143–157. [PubMed: 16511407]
12. Fisher JD, Smith L. Secondary prevention of HIV infection: The current state of prevention for positives. *Curr Opin HIV AIDS*. 2009; 4(4):279–287. [PubMed: 19532065]
13. Grimley DM, Bachmann LH, Jenckes MW, Erbeling EJ. Provider-delivered, theory-based, individualized prevention interventions for HIV positive adults receiving HIV comprehensive care. *AIDS Behav*. 2007; 11(5 Suppl):S39–S47. [PubMed: 17149671]
14. Myers JJ, Shade SB, Rose CD, et al. Interventions delivered in clinical settings are effective in reducing risk of HIV transmission among people living with HIV: results from the Health Resources and Services Administration (HRSA)'s Special Projects of National Significance initiative. *AIDS Behav*. 2010; 14(3):483–492. [PubMed: 20229132]
15. Safren SA, O'Cleirigh C, Skeer MR, et al. Demonstration and evaluation of a peer-delivered, individually-tailored, HIV prevention intervention for HIV-infected MSM in their primary care setting. *AIDS Behav*. 2011; 15(5):949–958. [PubMed: 20853023]
16. Mayer KH, O'Cleirigh C, Skeer M, et al. Which HIV-infected men who have sex with men in care are engaging in risky sex and acquiring sexually transmitted infections: findings from a Boston community health centre. *Sex Transm Infect*. 2010; 86(1):66–70. [PubMed: 19720603]
17. Gorbach PM, Drumright LN, Daar ES, Little SJ. Transmission behaviors of recently HIV-infected men who have sex with men. *J Acquir Immune Defic Syndr*. 2006; 42(1):80–85. [PubMed: 16763494]
18. Weinhardt LS, Carey MP, Johnson BT, Bickham NL. Effects of HIV counseling and testing on sexual risk behavior: a meta-analytic review of published research, 1985–1997. *Am J Public Health*. 1999; 89(9):1397–1405. [PubMed: 10474559]
19. Weinhardt, LS. HIV diagnosis and risk behavior. In: Kalichman, S., editor. *Positive Prevention: Reducing HIV transmission among people living with HIV*. New York: Kluwer Academic/Plenum; 2005. p. 29–63.

20. Eaton LA, Kalichman SC. Changes in transmission risk behaviors across stages of HIV disease among people living with HIV. *J Assoc Nurses AIDS Care*. 2009; 20(1):39–49. [PubMed: 19118770]
21. Heijman T, Geskus RB, Davidovich U, Coutinho RA, Prins M, Stolte IG. Less decrease in risk behaviour from pre-HIV to post-HIV seroconversion among MSM in the combination antiretroviral therapy era compared with the pre-combination antiretroviral therapy era. *AIDS*. 2012; 26(4):489–495. [PubMed: 22156971]
22. Colfax GN, Buchbinder SP, Cornelisse PG, Vittinghoff E, Mayer K, Celum C. Sexual risk behaviors and implications for secondary HIV transmission during and after HIV seroconversion. *AIDS*. 2002; 16(11):1529–1535. [PubMed: 12131191]
23. Dombrowski JC, Harrington RD, Golden MR. Evidence for the long-term stability of HIV transmission-associated sexual behavior after HIV diagnosis. *Sex Transm Dis*. 2013; 40(1):41–45. [PubMed: 23254116]
24. Holtgrave D, McGuire J. Impact of counseling in voluntary counseling and testing programs for persons at risk for or living with HIV infection. *Clin Infect Dis*. 2007; 45(Supplement4):S240–S243. [PubMed: 18190293]
25. Doll SL, Kennedy BM. HIV counseling and testing: what is it and how well does it work? *AIDS Testing*: Springer. 1994:302–319.
26. Metsch LR, Feaster DJ, Gooden L, et al. Effect of risk-reduction counseling with rapid HIV testing on risk of acquiring sexually transmitted infections: the AWARE randomized clinical trial. *JAMA*. 2013; 310(16):1701–1710. [PubMed: 24150466]
27. McBride CM, Ostroff JS. Teachable moments for promoting smoking cessation: the context of cancer care and survivorship. *Cancer Control*. 2003; 10(4):325–333. [PubMed: 12915811]
28. Noar SM. Behavioral interventions to reduce HIV-related sexual risk behavior: review and synthesis of meta-analytic evidence. *AIDS Behav*. 2008; 12(3):335–353. [PubMed: 17896176]
29. Fisher JD, Fisher WA. Changing AIDS-risk behavior. *Psychol Bull*. 1992; 111(3):455. [PubMed: 1594721]
30. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot*. 1997; 12(1):38–48. [PubMed: 10170434]
31. Noar SM. An interventionist's guide to AIDS behavioral theories. *AIDS Care*. 2007; 19(3):392–402. [PubMed: 17453575]
32. DiFranceisco W, Pinkerton SD, Dyatlov RV, Swain GR. Evidence of a brief surge in safer sex practices after HIV testing among a sample of high-risk men and women. *J Acquir Immune Defic Syndr*. 2005; 39(5):606–612. [PubMed: 16044015]
33. Callahan EJ, Flynn NM, Kuenneth CA, Enders SR. Strategies to reduce HIV risk behavior in HIV primary care clinics: brief provider messages and specialist intervention. *AIDS Behav*. 2007; 11(5 Suppl):S48–S57. [PubMed: 17205389]
34. Mallinson RK, Rajabiun S, Coleman S. The provider role in client engagement in HIV care. *AIDS Patient Care STDS*. 2007; 21(Suppl 1):S77–S84. [PubMed: 17563293]
35. Bankoff SM, McCullough MB, Pantalone DW. Patient-provider relationship predicts mental and physical health indicators for HIV-positive men who have sex with men. *J Health Psychol*. 2013; 18(6):762–772. [PubMed: 23449678]
36. Mugavero MJ, Norton WE, Saag MS. Health care system and policy factors influencing engagement in HIV medical care: piecing together the fragments of a fractured health care delivery system. *Clin Infect Dis*. 2011; 52(suppl 2):S238–S246. [PubMed: 21342913]
37. Granich R, Crowley S, Vitoria M, et al. Highly active antiretroviral treatment as prevention of HIV transmission: review of scientific evidence and update. *Curr Opin HIV AIDS*. 2010; 5(4):298. [PubMed: 20543604]
38. Hull MW, Wu Z, Montaner JS. Optimizing the engagement of care cascade: a critical step to maximize the impact of HIV treatment as prevention. *Curr Opin HIV AIDS*. 2012; 7(6):579–586. [PubMed: 23076123]
39. Gardner EM, McLees MP, Steiner JF, Del Rio C, Burman WJ. The spectrum of engagement in HIV care and its relevance to test-and-treat strategies for prevention of HIV infection. *Clin Infect Dis*. 2011; 52(6):793–800. [PubMed: 21367734]

40. Katz MH, Cunningham WE, Fleishman JA, et al. Effect of case management on unmet needs and utilization of medical care and medications among HIV-infected persons. *Ann Intern Med.* 2001; 135(Number 8 Part 1):557–565. [PubMed: 11601927]
41. Drabkin AS, Sikkema KJ, Wilson PA, et al. Risk patterns preceding diagnosis among newly HIV-diagnosed men who have sex with men in New York City. *AIDS Patient Care STDS.* 2013; 27(6): 333–341. [PubMed: 23730703]
42. Weinhardt LS, Carey MP, Maisto SA, Carey KB, Cohen MM, Wickramasinghe SM. Reliability of the timeline follow-back sexual behavior interview. *Ann Behav Med.* 1998; 20(1):25–30. [PubMed: 9755348]
43. Sikkema KJ, Hansen NB, Kochman A, et al. The development and feasibility of a brief risk reduction intervention for newly HIV-diagnosed men who have sex with men. *J Community Psychol.* 2011; 39(6):717–732. [PubMed: 22228917]
44. Cohen, J. *Statistical power analysis for the behavioral sciences.* 2nd ed. Hillsdale, NJ: Erlbaum; 1988.
45. Rosnow RL, Rosenthal R. Computing contrasts, effect sizes, and counternulls on other people's published data: general procedures for research consumers. *Psychol Meth.* 1996; 1(4):331–340.
46. Rietmeijer CA, Lloyd LV, McLean C. Discussing HIV serostatus with prospective sex partners: a potential HIV prevention strategy among high-risk men who have sex with men. *Sex Transm Dis.* 2007; 34(4):215–219. [PubMed: 17179774]
47. Ostrow DG, Silverberg MJ, Cook RL, et al. Prospective study of attitudinal and relationship predictors of sexual risk in the multicenter AIDS cohort study. *AIDS and Behav.* 2008; 12(1):127–138.
48. Rowiak S. Safe sex fatigue, treatment optimism, and serosorting: new challenges to HIV prevention among men who have sex with men. *J Assoc Nurses AIDS Care.* 2009; 20(1):31–38. [PubMed: 19118769]
49. Steward WT, Remien RH, Higgins JA, et al. Behavior change following diagnosis with acute/early HIV infection—a move to serosorting with other HIV-infected individuals. The NIMH Multisite Acute HIV Infection Study: III. *AIDS Behav.* 2009; 13(6):1054–1060. [PubMed: 19504178]
50. Eaton LA, Kalichman SC, O'Connell DA, Karchner WD. A strategy for selecting sexual partners believed to pose little/no risks for HIV: serosorting and its implications for HIV transmission. *AIDS Care.* 2009; 21(10):1279–1288. [PubMed: 20024704]
51. Kennedy CE, Bernard LJ, Muessig KE, et al. Serosorting and HIV/STI infection among HIV-negative MSM and transgender people: a systematic review and meta-analysis to inform WHO guidelines. *J Sex Transm Dis.*
52. Kalichman SC, Rompa D, Cage M. Sexually transmitted infections among HIV seropositive men and women. *Sex Transm Infect.* 2000; 76(5):350–354. [PubMed: 11141850]
53. Modjarrad K, Vermund SH. Effect of treating co-infections on HIV-1 viral load: a systematic review. *Lancet Infect Dis.* 2010; 10(7):455–463. [PubMed: 20610327]
54. Taiwo B, Barcena L, Tressler R. Understanding and controlling chronic immune activation in the HIV-infected patients suppressed on combination antiretroviral therapy. *Curr HIV/AIDS Rep.* 2013; 10(1):21–32. [PubMed: 23225316]
55. Golden MR, Stekler J, Hughes JP, Wood RW. HIV serosorting in men who have sex with men: is it safe? *J Acquir Immune Defic Syndr.* 2008; 49(2):212–218. [PubMed: 18769346]
56. Parsons JT, Severino J, Nanin J, et al. Positive, negative, unknown: assumptions of HIV status among HIV-positive men who have sex with men. *AIDS Educ Prev.* 2006; 18(2):139. [PubMed: 16649959]
57. Morin SF. Effects of a behavioral intervention to reduce risk of transmission among people living with HIV: the Healthy Living Project randomized controlled study. *J Acquir Immune Defic Syndr.* 2007; 44:213–221. [PubMed: 17146375]
58. Gardner LI, Marks G, O'Daniels CM, et al. Implementation and evaluation of a clinic-based behavioral intervention: positive steps for patients with HIV. *AIDS Patient Care STDS.* 2008; 22(8):627–635. [PubMed: 18627280]

59. Golin CE, Earp JA, Grodensky CA, et al. Longitudinal effects of SafeTalk, a motivational interviewing-based program to improve safer sex practices among people living with HIV/AIDS. *AIDS Behav.* 2012; 16(5):1182–1191. [PubMed: 21964975]
60. Morin SF, Shade SB, Steward WT, et al. A behavioral intervention reduces HIV transmission risk by promoting sustained serosorting practices among HIV-infected men who have sex with men. *J Acquir Immune Defic Syndr.* 2008; 49(5):544. [PubMed: 18989221]
61. Mausbach BT, Semple SJ, Strathdee SA, Zians J, Patterson TL. Efficacy of a behavioral intervention for increasing safer sex behaviors in HIV-positive MSM methamphetamine users: results from the EDGE study. *Drug Alcohol Depend.* 2007; 87(2–3):249–257. [PubMed: 17182196]
62. Safren SA, O'Cleirigh CM, Skeer M, Elsesser SA, Mayer KH. Project enhance: a randomized controlled trial of an individualized HIV prevention intervention for HIV-infected men who have sex with men conducted in a primary care setting. *Health Psychol.* 2013; 32(2):171. [PubMed: 22746262]
63. Carey MP, Senn TE, Venable PA, Coury-Doniger P, Urban MA. Brief and intensive behavioral interventions to promote sexual risk reduction among STD clinic patients: results from a randomized controlled trial. *AIDS and Behav.* 2010; 14(3):504–517.
64. Lawson PJ, Flocke SA. Teachable moments for health behavior change: a concept analysis. *Patient Educ Couns.* 2009; 76(1):25–30. [PubMed: 19110395]
65. Gorbach PM, Weiss RE, Jeffries R, et al. Behaviors of recently HIV-infected men who have sex with men in the year postdiagnosis: effects of drug use and partner types. *J Acquir Immune Defic Syndr.* 2011; 56(2):176–182. [PubMed: 21119524]
66. Thompson MA, Mugavero MJ, Amico KR, et al. Guidelines for improving entry into and retention in care and antiretroviral adherence for persons with HIV: evidence-based recommendations from an International Association of Physicians in AIDS Care panel. *Ann Intern Med.* 2012; 156(11):817–833. [PubMed: 22393036]
67. Flickinger TE, Saha S, Moore RD, Beach MC. Higher quality communication and relationships are associated with improved patient engagement in HIV care. *J Acquir Immune Defic Syndr.* 2013; 63(3):362–366. [PubMed: 23591637]
68. Hall HI, Frazier EL, Rhodes P, et al. Differences in human immunodeficiency virus care and treatment among subpopulations in the United States. *JAMA Intern Med.* 2013; 173(14):1337–1344. [PubMed: 23780395]
69. Traeger L, O'Cleirigh C, Skeer MR, Mayer KH, Safren SA. Risk factors for missed HIV primary care visits among men who have sex with men. *J Behav Med.* 2012; 35(5):548–556. [PubMed: 22068878]
70. Kinsler JJ, Wong MD, Sayles JN, Davis C, Cunningham WE. The effect of perceived stigma from a health care provider on access to care among a low-income HIV-positive population. *AIDS Patient Care STDS.* 2007; 21(8):584–592. [PubMed: 17711383]
71. Nicolai LM, Farley TA, Ayoub MA, Magnus M, Kissinger PJ. HIV-infected persons' knowledge of their sexual partners' HIV status. *AIDS Educ Prev.* 2002; 14(3):183–189. [PubMed: 12092920]
72. Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep.* 2006; 55(RR-14):1–17. [PubMed: 16988643]

Figure 1.
Flow of the study participants through the trial

Figure 2.
Predicted mean counts of the unprotected anal intercourse (UAI) outcome, by treatment condition

Figure 3.

Predicted mean counts of the unprotected anal intercourse with a serodiscordant partner (UAI-SD) outcome, by treatment condition

Table 1

Characteristics of the sample by treatment condition at baseline

	C-SoC Comparison Condition N (%)	PC Intervention Condition N (%)	Total sample N (%)
DEMOGRAPHIC CHARACTERISTICS			
Sample size	51 (50.0)	51 (50.0)	102 (100.0)
Age, <i>Mean (SD)</i>	34.3 (9.4)	30.2 (7.7)	32.2 (8.8)
Gender			
Male	51 (100)	47 (92.2)	98 (96.1)
Transgender	0 (0)	4 (7.8)	4 (3.9)
Race/ethnicity			
White	17 (33.3)	21 (41.2)	38 (37.3)
AA/Black	7 (13.7)	8 (15.7)	15 (14.7)
Hispanic/Latino	17 (33.3)	13 (25.5)	30 (29.4)
Other	10 (19.7)	9 (17.6)	19 (18.6)
Income			
\$30,000	35 (68.6)	39 (78.0)	74 (73.3)
Over \$30,000	16 (31.4)	11 (22.0)	27 (26.7)
Current Employment Status			
Working/student	33 (64.7)	35 (68.6)	68 (66.7)
Unemployed	18 (35.3)	16 (31.4)	34 (33.3)
Education			
12 th grade/GED	11 (21.6)	11 (21.6)	22 (21.6)
At least some college	40 (78.4)	40 (78.4)	80 (78.4)
Sexual Orientation			
Gay/Homosexual	50 (98.0)	47 (92.2)	97 (95.1)
Bisexual	1 (2.0)	1 (2.0)	2 (2.0)
Straight / Heterosexual	0 (0)	3 (5.9)	3 (3.0)
RELATIONSHIP CHARACTERISTICS			
Had a primary partner	21 (41.2)	20 (39.2)	41 (40.2)
Number of partners, <i>Mean (SD)</i>	4.5 (6.3)	4.0 (4.7)	4.3 (5.6)
HIV-RELATED HEALTH CHARACTERISTICS			
CD4 count, <i>N (Mean, SD)</i>	35 (476, 218)	43 (503, 255)	78 (491, 238)
CD4 count 350	14 (40.0)	10 (23.3)	24 (30.8)
Viral load, <i>N (Mean, SD)</i>	32 (40150, 76000)	39 (63040, 140670)	71 (52720, 115900)
Viral load 100,000	4 (12.5)	6 (15.4)	10 (14.1)
Currently on ART	13 (25.5)	15 (29.4)	28 (27.5)

Note: No significant differences were found between the two conditions

Adjusted fixed effect parameter estimates for unprotected anal intercourse (UAI) and transmission risk behavior (UAI-SD) outcomes using a longitudinal random effects model

Table 2

	Unprotected anal intercourse with all partners (UAI)		UAI with sero-discordant partners (UAI-SD)	
	Parameter estimate (SE)	F _(1,125)	Parameter estimate (SE)	F _(1,103)
Condition	-0.16 (0.33)	0.25	0.89 (0.51)	3.02
Time	-0.14 (0.16)	0.78	0.05 (0.24)	0.04
Time*Condition	0.19 (0.23)	0.67	-0.73 (0.34)	4.63

Table 3

Adjusted means^a for counts of unprotected anal intercourse (UAI) and unprotected anal intercourse with sero-discordant partners (UAI-SD) by treatment condition from baseline to 9 months follow-up

	n	Baseline Mean (SE)	3-month Follow-up Mean (SE)	6-month Follow-up Mean (SE)	9-month Follow-up Mean (SE)
<i>Counts of UAI with all partners</i>					
PC Intervention Condition	51	10.27 (2.56)	5.01 (1.61)	7.44 (2.87)	11.39 (5.08)
C-SoC Comparison Condition	51	8.90 (2.22)	10.53 (3.22)	6.24 (2.33)	6.32 (3.01)
<i>bCounts of UAI-SD with HIV-negative or unknown serostatus partners</i>					
PC Intervention Condition	38	4.03 (1.62)	2.91 (1.33)	1.14 (0.78)	0.45 (0.44)
C-SoC Comparison Condition	42	1.76 (0.69)	2.69 (1.18)	0.76 (0.52)	2.92 (2.86)

Notes:

^a Adjusted means and SEs produced by PROC GLIMMIX.

^b Only includes the subsample of participants who reported sexual activity with an HIV-negative or unknown status partner during the study.