

# Correlates of Putting Condoms On After Sex Has Begun and of Removing Them Before Sex Ends: A Study of Men Attending an Urban Public STD Clinic

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This study aimed to identify possible correlates of putting condoms on after sex has begun and taking them off before sex has ended among male patients of an urban, public sexually transmitted disease clinic. Participants responded to a questionnaire and were largely African American men, 18 to 35 years old, who had used a condom during penile-vaginal intercourse at least three times in the past 3 months. In controlled analyses, men who were not highly motivated to use condoms correctly were nearly twice as likely to put a condom on after sex

had begun. Men who reported erection loss during sex were about twice as likely to remove condoms before sex ended. Men reporting difficulties with the fit and feel of condoms were 2.5 times more likely to remove condoms early. Identified correlates may be amenable to clinic-based education and counseling augmented by offering a variety of condom brands and sizes to patients.

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**T**he promotion of condom use for patients at risk of acquiring or transmitting sexually transmitted diseases (STDs) is a challenging and critically vital aspect of clinical practice. Indeed, recent evidence is quite compelling that the male

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latex condom is the single best method of reducing the risk of acquiring and transmitting STDs for people who choose to have sex (Centers for Disease Control and Prevention, 2002; Holmes, Levine, & Weaver, 2004). For condoms to be effective, however, they must be used consistently and correctly (Crosby, DiClemente, Holtgrave, & Wingood, 2002). Accumulating evidence suggests that condom failure is a consequence of user error rather than product failure (Civic et al., 2002; Crosby, DiClemente, Wingood, Lang, & Harrington, 2003; Crosby et al., 2005; Crosby, Sanders, Yarber, & Graham, 2003; Graham, Crosby, Sanders, & Yarber, 2005). Clearly, then, identifying common user errors represents an important starting point toward the goal of promoting the correct use of condoms. Although several studies have investigated condom use errors among people in clinical settings (Albert, Hatcher, & Graves, 1991; Civic et al., 2002; Grimley, Annang, Houser, & Chen, 2005; Lindberg, Sonenstein, Ku, & Levine, 1997; Mertz et al., 2000; Richters, Donovan, & Gerofi, 1993; Shlay, McClung, Patnaik, & Douglas, 2004;

Spruyt et al., 1998; Steiner, Piedrahita, Glover, & Joanis, 1993; Trussell, Warner, & Hatcher, 1992; Valappil et al., 2005), two important errors have been understudied: putting condoms on after sex has begun and taking them off before sex has ended.

Previous studies have identified the prevalence of these two forms of condom use errors (Albert et al., 1991; Civic et al., 2002; Crosby, Salazar, et al., 2005; Crosby, Sanders, et al., 2003; Grimley et al., 2005; Shlay et al., 2004; Valappil et al., 2005). However, only one published study has investigated the correlates of these errors. Civic and colleagues (2002) reported that putting on condoms after sex has begun was more common among younger compared to older adolescent female patients. This study reported this practice to be more common among those with a primary sex partner, a nonsupportive sex partner, multiple sex partners, those using condoms as a form of birth control, and those using condoms on a frequent basis. The study did not assess the behavior of removing condoms before sex was over, and males were not included. A study of males might yield vastly different findings given that they may frequently control condom use. Removing condoms before sex ends may be quite different than putting them on after sex begins. Accordingly, the purpose of this study was to identify correlates, among male patients of an STD clinic, of putting condoms on after sex has begun and taking them off before sex has ended.

## Methods

### Sample

Data were collected at a large, urban, Midwestern, public STD clinic from October 2004 to September 2005. Men attending the clinic were recruited in the waiting area and screened for eligibility in a private room. Inclusion criteria were (a) being 18 to 35 years of age, (b) speaking English, and (c) reporting that a male condom was used at least three times in the past 3 months for sex (penis in vagina) with a female. Five hundred and sixteen men were screened, and 351 met inclusion criteria. Of these, 314 (89.5%) agreed to participate and completed a questionnaire. After providing written informed consent, subjects completed a brief, self-administered, written questionnaire lasting 15 to 20 minutes. To minimize problems with literacy, the questions were recorded to a CD that men could choose to play using a portable headset to assist them in completing the questionnaire. Each question constituted a single track; thus, men could easily replay a

question just as they would a track of music. Responses were anonymous. Men who completed the questionnaire were paid \$10. The Institutional Review Board at Indiana University approved the protocol.

### Measures

A questionnaire refined through use in several studies involving a total of more than 800 men, including STD clinic attendees, was used to comprehensively assess men's self-reported condom use errors and problems (Crosby, Graham, Yarber, & Sanders, 2004; Crosby, Salazar, et al., 2005; Crosby, Sanders, Yarber, & Graham, 2003; Crosby, Sanders, et al., 2002; Crosby, Yarber, Sanders, & Graham, 2005; Yarber et al., 2005). The questionnaire has multiple components that are described below. Original questionnaire development was informed by widely cited condom use guidelines (Centers for Disease Control and Prevention, 1998; Warner & Hatcher, 1999). Because accuracy of recall was considered vital (Graham et al., 2005), the recall period was limited to the past three times condoms were used within the past 3 months. Sex was defined as *sexual intercourse or penis in vagina*.

**Outcomes.** There were two items on the aforementioned questionnaire that were primary outcomes in this analysis. One item asked men, "For the last three times you used a condom, did you start having sex without the condom and then put it on later?" Another item asked men, "For the last three times you used a condom, did you start having sex with it on and then take it off before sex was finished?" The latter item could be confounded by the event of having condoms break (i.e., breakage may have been followed by early removal of a condom). Thus, only men who reported no condom breakage (past three times condoms were used) were analyzed with respect to this measure of taking the condom off before sex ended.

**Correlates.** Four categories of potentially significant correlates were assessed.

The first was a collection of three background variables: age, minority status, and history of infection with STDs.

The second was motivation and self-efficacy to use condoms correctly. One item assessed personal motivation ("I am highly motivated to use condoms correctly"), and one assessed perceptions of partner motivation levels ("My partner[s] is [are] highly motivated to use condoms correctly"). Response

alternatives were provided using a 5-point scale ranging from *strongly agree* to *strongly disagree*. Finally, an 8-item index was used to assess men's self-efficacy for the correct use of condoms. These items asked men how easy or difficult it would be for them to perform various tasks. For example, one item was "How easy or difficult would it be for you to apply condoms correctly?" Responses were provided using a scale ranging from 1 (*very easy*) to 5 (*very difficult*). The index produced a satisfactory Cronbach's alpha of .70, suggesting adequate reliability of the measure.

The third category was composed of three items related to sexual sensation and condom use. It was anticipated that men or their female sex partners may start condom use late or end it early based on perceived loss of satisfaction with the condom relative to sexual sensation. Two items assessed erection loss: (a) "For the last three times you used a condom, did you lose your erection while putting it on?" and (b) "For the last three times you used a condom, did you lose your erection after sex had begun while using the condom?" The third item assessed whether men experienced difficulties with the fit or feel of condoms during the past three times condoms were used.

The final category was based on a composite measure of seven condom use errors: not checking the condom for visible damage before use, putting the condom on with the wrong side up and having to flip it over, not leaving a space for the receptacle tip, not expelling excess air, not using a water-based lubricant, using an oil-based lubricant, and letting the condom contact sharp objects such as teeth, fingernails, and jewelry. Possibly, men scoring relatively highly on this index of errors might be more likely to either put condoms on late or take them off early.

## Data Analysis

Both bivariate and multivariate analyses were conducted.

*Bivariate associations.* Based on an evaluation of skewness and kurtosis ratios, none of the continuous variables met the criteria for normality. Thus, each was dichotomized by performing a median split. Associations between the correlates and the two outcome measures were assessed by the use of prevalence ratios, their 95% confidence intervals, and their respective *p* values.

*Multivariate associations.* Correlates achieving a screening level of significance ( $p = .10$ ) were entered

into a multiple logistic regression model, using a forward stepwise method. Separate models were used for each of the two outcomes. Models were used to calculate adjusted odds ratios (AORs), 95% confidence intervals, and the corresponding *p* values of the correlates that remained significant in the multivariate analysis.

## Results

### Characteristics of the Sample

Despite screening attempts, 36 men provided questionnaire responses that indicated they were ineligible, thereby leaving an analytic sample of 278 men (88.5% of the 314). The mean age was 23.7 years ( $SD = 4.13$ ). About two thirds (67.6%) identified as Black or African American, nearly one quarter (23.7%) as White, and the remainder as other minority groups. Nearly one of every five men (18.7%) reported starting sex and putting the condom on later for at least one of the past three times a condom was used. Eighty-eight men were excluded from the measure of taking the condom off before sex had ended, because they reported one or more occasions of condom breakage. Of the remaining 190 men for this outcome measure, 23.7% ( $n = 45$ ) reported they had removed the condom before sex ended during at least one of the past three times condoms were used. The two outcome measures were not significantly associated with each other ( $p = .32$ ).

### Bivariate Associations

The bivariate associations between the assessed correlates and whether men put condoms on after starting sex are given in Table 1. As reported, only one correlate achieved significance. Men who did not strongly agree with the statement "I am highly motivated to use condoms correctly" were 1.67 times more likely to report putting condoms on after sex had started.

The bivariate associations pertaining to taking the condom off before sex was ended are shown in Table 2. As reported, four of the correlates achieved significance. Men who perceived that a sex partner was not highly motivated to use condoms were about twice as likely to take condoms off before sex had ended. Both assessed forms of erection loss were associated with an approximate twofold increase in likelihood of removing condoms early. Finally, men

**Table 1.** Bivariate Associations Between Selected Correlates and Whether Men Put Condoms On After Sex Had Begun ( $n = 278$ )

| Correlate                                                   | % Putting on Late | PR <sup>a</sup> | 95% CI <sup>b</sup> | <i>p</i> |
|-------------------------------------------------------------|-------------------|-----------------|---------------------|----------|
| Age                                                         |                   |                 |                     |          |
| Younger than 24 years ( $n = 152$ )                         | 15.8              |                 |                     |          |
| 24 years or older (122)                                     | 22.1              | .71             | .43 – 1.17          | .18      |
| Minority Status                                             |                   |                 |                     |          |
| Minority member (212)                                       | 18.4              |                 |                     |          |
| White (66)                                                  | 19.7              | .93             | .53 – 1.64          | .81      |
| History of One or More Sexually Transmitted Diseases (STDs) |                   |                 |                     |          |
| No (230)                                                    | 18.7              |                 |                     |          |
| Yes (47)                                                    | 19.1              | 1.02            | .54 – 1.95          | .94      |
| Highly Motivated to Use Condoms Correctly                   |                   |                 |                     |          |
| No (119)                                                    | 24.4              |                 |                     |          |
| Yes (158)                                                   | 14.6              | 1.67            | 1.02 – 2.74         | .04*     |
| Partner(s) Highly Motivated to Use Condoms Correctly        |                   |                 |                     |          |
| No (173)                                                    | 22.5              |                 |                     |          |
| Yes (101)                                                   | 12.9              | 1.75            | .98 – 3.12          | .05      |
| Self-efficacy to Use Condoms Correctly                      |                   |                 |                     |          |
| Low (144)                                                   | 18.8              |                 |                     |          |
| High (134)                                                  | 18.7              | 1.00            | .61 – 1.64          | .98      |
| Lost Erection While Putting Condom On <sup>c</sup>          |                   |                 |                     |          |
| Yes (78)                                                    | 17.9              |                 |                     |          |
| No (200)                                                    | 18.6              | .96             | .55 – 1.68          | .84      |
| Lost Erection During Sex <sup>c</sup>                       |                   |                 |                     |          |
| Yes (73)                                                    | 19.2              |                 |                     |          |
| No (204)                                                    | 18.6              | 1.03            | .59 – 1.79          | .92      |
| Problems With Fit or Feel of Condoms <sup>c</sup>           |                   |                 |                     |          |
| Yes (83)                                                    | 19.3              |                 |                     |          |
| No (195)                                                    | 18.5              | 1.04            | .61 – 1.77          | .87      |
| Number of Condom Use Errors                                 |                   |                 |                     |          |
| High (145)                                                  | 20.0              |                 |                     |          |
| Low (133)                                                   | 17.3              | 1.58            | .71 – 1.90          | .56      |

a. Prevalence ratio.

b. Confidence interval.

c. At least once during the past three times condoms were used.

\* $p \leq .05$ .

reporting difficulties with the fit and feel of condoms were more than twice as likely to remove condoms early.

### Multivariate Associations

The first model pertained to putting condoms on after sex began and contained two correlates (personal motivation and perceived motivation of partners to use condoms correctly). Only men's motivation

level achieved significance. Men who were not highly motivated to use condoms correctly were nearly twice as likely to put a condom on after sex had begun as those indicating high motivation (AOR = 1.88; 95% CI = 1.02 – 3.47;  $p = .04$ ).

The second model pertained to removing condoms before sex ended and contained five correlates (perceived motivation of partners to use condoms correctly, self-efficacy to use condoms correctly, both types of erection loss, and problems with fit

**Table 2.** Bivariate Associations Between Selected Correlates and Whether Condoms Were Removed Before Sex Had Ended ( $n = 190$ )

| Correlate                                                   | % Removing | PR <sup>a</sup> | 95% CI <sup>b</sup> | <i>p</i> |
|-------------------------------------------------------------|------------|-----------------|---------------------|----------|
| Age                                                         |            |                 |                     |          |
| Younger than 24 years                                       | 23.5       |                 |                     |          |
| 24 years or older                                           | 24.4       | .96             | .58 – 1.61          | .89      |
| Minority Status                                             |            |                 |                     |          |
| Minority member ( $n = 146$ )                               | 24.0       |                 |                     |          |
| White (44)                                                  | 22.7       | 1.05            | .57 – 1.95          | .86      |
| History of One or More Sexually Transmitted Diseases (STDs) |            |                 |                     |          |
| No (166)                                                    | 23.5       |                 |                     |          |
| Yes (23)                                                    | 26.1       | 1.10            | .53 – 2.33          | .86      |
| Highly Motivated to Use Condoms Correctly                   |            |                 |                     |          |
| No (82)                                                     | 29.3       |                 |                     |          |
| Yes (108)                                                   | 19.4       | 1.51            | .90 – 2.51          | .78      |
| Partner(s) Highly Motivated to Use Condoms Correctly        |            |                 |                     |          |
| No (119)                                                    | 29.4       |                 |                     |          |
| Yes (70)                                                    | 14.3       | 2.06            | 1.08 – 3.90         | .018*    |
| Self-efficacy to Use Condoms Correctly                      |            |                 |                     |          |
| Low (86)                                                    | 30.2       |                 |                     |          |
| High (104)                                                  | 18.3       | 1.65            | .99 – 2.78          | .05      |
| Lost Erection While Putting Condom On <sup>c</sup>          |            |                 |                     |          |
| Yes (48)                                                    |            | 35.4            |                     |          |
| No (142)                                                    | 19.7       | 1.80            | 1.08 – 3.00         | .027*    |
| Lost Erection During Sex <sup>c</sup>                       |            |                 |                     |          |
| Yes (43)                                                    | 39.5       |                 |                     |          |
| No (146)                                                    | 19.2       | 2.06            | 1.25 – 3.39         | .006*    |
| Problems With Fit or Feel of Condoms <sup>c</sup>           |            |                 |                     |          |
| Yes (45)                                                    | 40.0       |                 |                     |          |
| No (145)                                                    | 18.6       | 2.15            | 1.31 – 3.52         | .003*    |
| Number of Condom Use Errors                                 |            |                 |                     |          |
| High (98)                                                   | 27.6       |                 |                     |          |
| Low (192)                                                   | 19.6       | 1.41            | .83 – 2.38          | .20      |

a. Prevalence ratio.

b. Confidence interval.

c. At least once during the past three times condoms were used.

\*  $p \leq .05$ .

and feel). Two of these correlates achieved multivariate significance. Men who reported erection loss during sex (at least one of the past three times condoms were used) were more than twice as likely to remove condoms before sex ended as men not experiencing this occurrence (AOR = 2.33; 95% CI = 1.08 – 4.99;  $p = .03$ ). Men having problems with the fit and feel of condoms were nearly 2.5 times more likely to remove condoms early compared to men not reporting difficulties with fit and feel (AOR = 2.47; 95% CI = 1.17 – 5.24;  $p = .018$ ).

## Discussion

Among this sample of predominantly African American male patients of an urban, public STD clinic, only one correlate was significantly related to putting condoms on after starting sex: men's motivation level to use condoms correctly. Men with less motivation were more likely to delay condom application. Interestingly, men's self-efficacy to use condoms correctly, their erection loss while applying condoms, and their reports of difficulties with the fit and feel of



condoms were not even marginally associated with late application of condoms. Alternatively, several correlates pertaining to early removal of condoms were identified at the bivariate level, and two of these correlates retained multivariate significance. Men experiencing erection loss while using condoms were more likely to remove them early. Similarly, as we anticipated, men having difficulties with the fit and feel of condoms were more likely to remove condoms early.

The study findings have three implications for preventive medical practice. First, it appears that motivated men may be more likely to apply condoms before starting sex. This motivation was specific to the correct use of condoms; thus, it may be important for clinic-based education and counseling protocols to provide men with ample reason to value correct condom use rather than only promoting greater frequency of condom use. Achieving this goal may involve, for example, teaching men about pre-ejaculate and convincing them that even indiscernible amounts of semen could be adequate to cause pregnancy or transmit an STD. Men may become more motivated to use condoms after learning that viral STDs such as genital herpes and human papillomavirus are transmitted by skin-to-skin contact, thereby necessitating condom use from the start to finish of penetrative of sex. Additionally, men may benefit from learning that their risk of acquiring an STD (including HIV) from a female partner is greatly increased when they begin sex before applying condoms.

Second, the findings suggest that men who experience erection loss during condom use may be quick to remove condoms. Erection loss may inspire men to seek clinic-based education and counseling about improved quality of condom use. Learning that erection loss is a relatively common event for most men and that it is not unusual for men to experience erection loss in association with their use of condoms may be valuable to men. Men may then benefit from engaging in dialog with clinical personnel regarding ways to minimize condom-associated erection loss. Furthermore, men could be encouraged to discuss ways to avert any condom-associated erection loss with their sex partners.

Third, the study found that problems with condom fit and feel were independently associated with early removal. This observation, coupled with the premise that brand and size may influence condom-associated erection loss, is potentially important. STD clinics have traditionally offered free condoms to their patients; however, the selection has historically been limited to a single brand and size. Given

the relative importance of fit and feel based on this and other studies (Crosby et al., 2004; Crosby, Yarber, et al., 2005) public STD clinics should consider providing varied brands, shapes, and sizes of condoms for their patients.

### Limitations

As is true for any study of sexual behavior, the findings are limited by the validity of the self-reported data. However, it is reasonable to expect that the relatively narrow recall period (i.e., the past three times condoms were used) may have aided men in accurately recalling these events. Generalizability is limited by the use of a convenience sample. It is important to note that an event-specific analysis was not conducted; thus, it cannot be concluded that all of the assessed correlates occurred at the same time as the assessed outcomes. Last, the questionnaire did not assess why the condom was removed (e.g., because of loss of erection) before sex was finished.

### Conclusions

Among a predominantly African American sample of men having sex with women and attending a public, urban STD clinic, late application of condoms may be a result of not being highly motivated to use condoms correctly. Conversely, early removal of the condom may be a consequence of condom-associated erection loss and difficulties with the way condoms fit and feel during their use. Each of the three antecedents may be amenable to clinic-based education and counseling augmented by providing a broad variety of condom brands and sizes to patients. Because late application and early removal of the condom were commonly reported by men of this study, clinic-based education that addresses these risk behaviors is warranted. Further studies, such as qualitative investigations, that examine why men use condoms, and the role the partner plays in their use may elucidate our findings.

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