Published in final edited form as:

Sex Transm Dis. 2014 July ; 41(7): 427–432. doi:10.1097/OLQ.0000000000000150.

Associations of sexually transmitted infections with condom problems among young men who have sex with men

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Abstract

Background—Young men who have sex with men (YMSM) are disproportionately infected with STIs. Condom use is the most widely available means of preventing the transmission of STIs, but effectiveness depends on correct use. Condom errors, such as using an oil-based lubricant, have been associated with condom failures, such as breakage. Little research has been done on the impact of condom problems on the likelihood of contracting an STI.

Methods—Data came from Crew 450, a longitudinal study of HIV risk among YMSM (N = 450). All self-report data were collected using computer-assisted self-interview (CASI) technology and clinical testing was done for *gonorrhea*, *Chlamydia*, and HIV.

Results—Nearly all participants made at least one error, with high rates of using oil based lubricant and incomplete use. No differences were found in rates of condom problems during anal sex with a man versus vaginal sex with a woman. Black YMSM reported significantly higher use of oil based lubricants than White and Hispanic YMSM, an error significantly associated with HIV status (AOR = 2.60; 95% CI: 1.04 – 6.51). Participants who reported a condom failure were significantly more likely to have a STI (AOR=3.27; 95% CI: 1.31 – 8.12).

Conclusions—YMSM report high rates of condom problems, and condom failures were significantly associated with STIs after controlling for unprotected sex. Educational programs are needed to enhance correct condom use among YMSM. Further research is needed on the role of oil based lubricants in explaining racial disparities in STIs and HIV.

Keywords

Homosexuality; Male; Condoms; HIV; Sexually Transmitted Diseases; Adolescent

INTRODUCTION

Young men who have sex with men (YMSM) are disproportionately infected with HIV/AIDS in the U.S. The CDC's 2008 National HIV Behavioral Surveillance system (NHBS)

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Conflicts of interest

The authors have no conflicts of interest to disclose.

study of MSM in 21 U.S. cities found the HIV prevalence to be 7% in 18 to 19 year-olds and 12% in 20 to 24 year-olds, and higher among black young MSM (9% and 20%, respectively)¹. This prevalence is substantially higher than other groups of youth in the U.S. as YMSM accounted for 61% of HIV diagnoses in 2009². These disparities are even greater among Black YMSM—by race and risk group Black YMSM were the only population in the U.S. to show a statistically significant increase (48%) in new HIV infections from 2006 to 2009³. Sexually transmitted infections (STIs) increase susceptibility to HIV infection^{4,5} as well as having their own morbidity.

While biomedical prevention approaches for HIV prevention are being studied and considered for implementation, condom use continues to be the most widely available means of preventing the transmission of STIs including HIV. The effectiveness of condom use depends on correct and consistent use. The frequency of condom problems, as well as their impact, have been reported in a range of populations during vaginal and anal sex⁶, including among YMSM for anal sex⁷. Condom errors, such as using an oil-based lubricant, have been associated with condom failures, such as breakage⁷⁻¹⁰. Less research has been done on the impact of condom errors and failures on the likelihood of contracting an STI. One study of attendees at an urban STI clinic found an association between having any condom problem and being STI positive among men who had sex with women (MSW), but not among women or MSM¹¹. Another study of MSM examined the association between the number of condom problems and self-report STIs in two samples; there was a significant association in their clinic sample but not their community sample¹². As such, there is very limited research on the association between condom problems and STIs among MSM.

The goal of the current study was to test the association between self-reported condom problems and clinically assessed STIs among YMSM. We did this both for having any type of condom problem, as well as for individual types of condom errors, failures, and erection problems in order to determine if specific problems had greater effects on the likelihood of having an STI. We also examined if racial differences in condom issues may be a partial driver of disproportionalities in HIV by race among YMSM¹³. One study in a small sample of YMSM (N = 119) reported no significant differences in condom problems by race⁷, but the small sample may have precluded detecting differences. It is plausible that rates of condom errors and problems may differ for vaginal sex with women and anal sex with men. Among other reasons for this, the anus is not self-lubricating like the vagina¹⁴. Therefore we explored this possibility using a unique within-person comparison among those YMSM that engaged in both vaginal sex with women and anal sex with men. Finally, we tested the associations between condom errors and failures.

MATERIALS AND METHODS

Data came from Crew 450, a longitudinal study of a syndemic of psychosocial health issues linked to HIV among YMSM in Chicago and surrounding areas^{15,16}. Participants were eligible to enroll in the study if they were 16-20 years of age, born male, spoke English, had a previous sexual encounter with a man or identified as gay or bisexual, and were available for follow-up for 2 years. A modified form of respondent driven sampling¹⁷ was used to recruit participants. Following recommendations outlined by Jenkins¹⁸, a larger initial

convenience sample of “seeds” ($N = 172$; 38.2%) was utilized due to difficulties maintaining referral chains in the small social networks of YMSM compared to other populations (e.g., injection drug users). This approach has been used successfully in previous research with YMSM^{19,20}. Due to the large proportion of seeds comprising the study sample, traditional RDS analysis methods were not utilized as they require seed data to be removed from the analytic sample²¹ in order to ensure only peer-recruited individuals are included.

The study enrolled 450 YMSM between December 16, 2009, and February, 8, 2013. Seeds were recruited from the community through targeted in-person outreach at venues frequented by YMSM, as well as school organizational outreach, flyers posted in community settings frequented by the target population and through geo-social network applications (i.e. Grindr and Jackd). The demographic characteristics of the study sample are shown in Table 1. For the purpose of these analyses, data were only taken from the baseline assessment. All self-report data were collected using computer-assisted self-interview (CASI) technology with audio instructions in private rooms at one of four study locations with a median completion time of 80 minutes. Participants were compensated for their time and travel. The protocol was approved by the Institutional Review Boards (IRBs).

Measures

Condom Errors, Failures, and Erection Problems—A 15-item assessment was administered that measured the frequency of condom errors, failures, and erection problems related to condom use while engaging in anal sex with a male partner in the past 6 months. In addition, a similar 14-item assessment was administered referring to vaginal sex. Items were adapted from a previous study⁸ and administered on a 5-point Likert scale (1=always, 2=more than half the time, 3=about half the time, 4=less than half the time, 5=never). For analyses, each item was dichotomized to represent if the error, failure, or erection problem ever occurred in the prior 6 months.

STI and HIV Prevalence—At baseline, urine specimens were collected and nucleic acid amplification testing was performed to detect the presence of *Neisseria gonorrhea* (NG) and *Chlamydia trachomatis* (CT). We tested for these STIs because they are the most common among YMSM^{22,23}. STI prevalence, for the purpose of these analyses, is defined by the presence of either NG or CT. In addition, HIV prevalence was determined through OraQuick oral fluid test to identify the presence of HIV antibodies. A small number of HIV positive participants self-reported their status, which was documented through a HAART prescription or a release of their medical record.

Statistical Analysis

The proportion of participants reporting each condom error, condom failure or erection problem during anal and vaginal sex was calculated. Chi-square tests were conducted to determine if age and racial differences existed in these proportions. Next, within-participant differences in the proportion of condom errors, condom failures or erection problems between anal versus vaginal sex was analyzed using McNemar's test. Lastly, the association between each condom error, failure or erection problem and a participant being infected with a STI and HIV at baseline, as well as the association between each condom error and

any reported condom failure, was analyzed using logistic regression, while controlling for age, race and number of male unprotected anal sex partners.

RESULTS

Table 2 shows the frequency of each condom error, failure, and erection problem occurring for individuals who used condoms for anal and/or vaginal sex. Of the entire sample ($n=450$), 66.2% ($n=298$) of participants were administered the items referencing anal sex since 23.8% ($n=107$) did not report engaging in anal sex with a male partner, 9.3% ($n=42$) reported never attempting to use a condom during anal sex, and 0.7% ($n=3$) had missing data. For items referencing vaginal sex, 14.1% ($n=64$) of participants were administered the corresponding condom problem items since 82.2% ($n=370$) did not report engaging in vaginal sex, 2.9% ($n=13$) reported never attempting to use a condom during vaginal sex, and 0.7% ($n=3$) had missing data. During anal and vaginal sex respectively, participants reported a median of 3.5 (IQR=3.0) and 5.0 (IQR=3.0) different types of condom errors, 0.0 (IQR=1.0) and 1.0 (IQR=3.0) different types of condom failures, and 1.0 (IQR=2.0) and 1.0 (IQR=2.0) different type of erection problems, respectively. Nearly all participants made at least one error, with high rates of using oil based lubricant, failing to leave space at the tip or squeeze air out, and incomplete use. A third to a half of participants experienced condom failures and erection problems.

For participants who reported attempting to use a condom during both anal and vaginal sex ($n=38$), differences in the proportion of each condom error, failure, and erection problem occurring were tested. This analysis differs from the proportions shown in Table 2 because it only included those who used condoms for both anal *and* vaginal sex, whereas Table 2 shows data for anyone who used condoms for vaginal *and/or* anal sex. None of the questions that were administered for both anal and vaginal sex showed significant differences in their proportion of occurrence (results not shown; all $p>0.05$). The overall mean difference in percent endorsement of each error occurring (anal sex errors minus vaginal sex errors) amongst this sample across all 13 items was 0.4%.

The proportions of participants reporting the occurrence of each condom error, failure, or erection problem during anal sex, stratified by race, are shown in Table 3. Bivariate chi-square tests were conducted for each unique pair of racial groups and significant differences are noted in the table. For example, Black YMSM reported significantly higher use of oil based lubricants with condoms than White and Hispanic YMSM. White YMSM were also significantly less likely to experience a condom failure than Black and Hispanic YMSM. Significant differences in age were not found for any of the condom error, failure or erection problem items during anal sex (results not shown).

Table 4 shows the adjusted odds ratios for the association for each error, failure, or erection problem that occurred during anal sex and being positive for STIs or HIV controlling for age, race, and number of male unprotected anal sex partners. Participants who reported that a condom broke during anal sex (AOR=2.84; 95% CI: 1.19 – 6.73), slipped off during anal sex (AOR=3.13; 95% CI: 1.29 – 7.59), or either failure occurred (AOR=3.27; 95% CI: 1.31 – 8.12) were significantly more likely ($p<.05$) to have a STI infection at baseline than

participants who did not report the occurrence of these failures. Participants reporting the use of an oil-based lubricant during anal sex (AOR=2.60; 95% CI: 1.04 – 6.51) and that a condom slipped off during anal sex (AOR=3.11; 95% CI: 1.15 – 8.41) were significantly more likely ($p<.05$) to be diagnosed with HIV than those participants who did not report these condom problems.

The adjusted odds ratios for the association between each condom error and either condom failure (i.e., break or slip off) occurring during anal sex, controlling for age, race, and number of male unprotected anal sex partners, are shown in Table 5. Participants who endorsed the following errors were found to be significantly more likely ($p<.05$) to report that a condom failure occurred: condom put on wrong side up (AOR: 2.34; 95% CI: 1.22 – 4.51), space not left at the tip (AOR: 1.89; 95% CI: 1.05 – 3.42), use of an oil-based lubricant (AOR: 2.96; 95% CI: 1.65 – 5.30), condom came in contact with a sharp object (AOR: 2.25; 95% CI: 1.05 – 4.78), participant applied condom after sex already began (AOR: 3.20; 95% CI: 1.62 – 6.29), participant initiated removal of condom before sex was finished (AOR: 3.73; 95% CI: 1.98 – 7.03), and partner initiated removal of condom before sex was finished (AOR: 3.60; 95% CI: 1.73 – 7.50).

CONCLUSIONS

Studies of the association between condom problems and STI outcomes are scarce in all groups and this study is the first to report an association using such clinical endpoints among YMSM—a population at high and growing risk. Our results show that even after controlling for number of unprotected anal sex partners, condom breakage and slippage were both significantly associated with increased odds of NG/CT. Condom slippage was also significantly associated with an HIV positive status. Erection loss and most condom errors were not significantly related with STI/HIV outcomes, except for using an oil based lubricant, which was significantly associated with an HIV positive status even after controlling for race (Black YMSM were more likely to make this error).

Rates of condom problems were high among all study groups, with nearly all participants making at least one error, 40-60% experiencing a condom failure, and the majority experiencing erection loss associated with condom use. Particularly troubling were certain errors that were previously related to condom failure among YMSM⁷. Rates of using oil based lubricants with condoms were high in this sample, and particularly high among the Black YMSM—a finding replicating earlier research⁷. Prior studies of YMSM have shown using oil based lubricants was associated with condom breakage⁷ and we replicated that result. This pattern of results suggests a potential pathway from use of oil based lubricant, to condom breakage, to STI/HIV infection. Given higher rates of HIV and STIs among Black YMSM¹ and the now replicated finding of higher rates of using oil based lubricants, efforts should be mobilized towards educating Black YMSM that using oil based products reduces condom effectiveness. Doing so may help reduce STI/HIV disparities among YMSM.

Incomplete use of a condom (i.e. not using it from the start to finish of sex) is also particularly problematic because it was frequent within the sample—particularly among racial/ethnic minority participants—and because of the risk of STI/HIV transmission.

YMSM need to be educated that pre-ejaculate can transmit STIs including HIV. Furthermore, young men may be particularly poor at timing their ejaculation, making withdrawal prior to ejaculation a particularly ineffective harm reduction strategy for this population.

Rates of erection loss during condom application and use were high. Although some studies have described erection problems related to condom use among young men²⁴, erectile dysfunction is typically considered a sexual health issue for older men. The high rates associated with condom use in this sample are problematic because actual and/or perceived problems with an erection may lead to avoidance of condom use, incomplete condom use (i.e. removal upon perception of declining rigidity), or adoption of the receptive role in anal sex because it does not require an erection²⁵. Given that receptive sex is a higher risk behavior for HIV transmission, adoption of this sexual position due to erection problems associated with condom use could increase risk for HIV infection. One way to address this issue may be to educate YMSM in a developmentally appropriate way about how to enhance sensation and pleasure during condom use. For example, one randomized trial of adult heterosexual couples found that providing instruction in how to “erotically” incorporate condoms into sexual behavior significantly enhanced attitudes towards condoms at follow-up²⁶. Intervention programs designed for youth that use a comprehensive sexual health framework²⁷ that address sexual pleasure, such as the online Queer Sex Ed intervention for LGBT youth²⁸, may be best positioned to provide instruction in pleasurable sex with condom use and thereby potentially addressing this issue.

A particularly novel aspect of this study was our comparison of condom problems during vaginal sex with women and during anal sex with men among the behaviorally bisexual YMSM. We found no significant differences between these two types of partnered acts, suggesting that it may be unnecessary to develop distinctly targeted education materials based on gender of sex partner.

Our findings must be interpreted in the context of study limitation. First, the sample was not randomly sampled from the population of YMSM, which may limit the generalizability of our findings. Second, while we tested for NG, CT, and HIV, we relied on self-report of condom problems and the number of unprotected sex partners^{29,30}. This introduces the possibility that racial differences in reports of condom problems may be due to differential reporting bias, rather than reflecting true differences. However, our use of CASI for data collection should have helped reduce social desirability bias^{18,19} and the results of one prior study were inconsistent with racial differences in reporting bias for sexual risk behaviors among YMSM³¹. We used OraQuick oral fluid tests for HIV, which may not have detected recent infections³² and therefore our results may be an underestimate of the association between condom problems and HIV infection.

The frequency of condom problems in this sample were very high, particularly among the Black YMSM. The consequences of condom user errors are clear—they increase the likelihood of breakage and slippage, which thereby increases the risk of STI/HIV transmission. YMSM need interventions that not only promote condom use overall, but also build motivation and skills necessary for correct condom use. Such education may take a

variety of forms: on social media, through sex education programs, by healthcare providers, or included along with condom packages. Another tactic would be to design new condoms that are less prone to errors (e.g. condom applicators) or that are more robust to errors so that they are less likely to slip and break. In this vein, the Gates Foundation recently announced a Grand Challenge competition to for funding to develop next generation condoms that are easier to use and properly apply as well as increasing or preserving pleasure³³. Whatever the approach, our results clearly call for an increase in efforts to reduce condom errors among YMSM—particularly among youth of color.

Acknowledgments

Support

This study was supported by a grant from the National Institute on Drug Abuse (R01DA025548). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

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Table 1

Demographic Characteristics: Young Men Who Have Sex With Men Aged 16-20 Years, Chicago, IL, 2009-2012 (n=450)

	N (%)
Age (M = 18.9, SD = 1.3)	
16-18	116 (25.8)
18-20	334 (74.2)
Race/Ethnicity	
Black/African American	240 (53.3)
Hispanic/Latino	90 (20.0)
White	81 (18.0)
Other	39 (8.7)
Sexual Orientation	
Only or mostly gay	329 (73.1)
Bisexual	96 (21.3)
Only or mostly heterosexual	14 (3.1)
Other	11 (2.4)
Highest Education	
Less than high school	174 (38.7)
High school or GED	120 (26.7)
Greater than high school	156 (34.7)
HIV Prevalence	34 (7.6)
STI Prevalence	37 (8.2)

Proportion of Participants Reporting Each Condom Error, Failure, and Erection Problem in the Past 6 Months During Anal and Vaginal Sex: Young Men Who Have Sex With Men Aged 16-20 Years, Chicago, IL, 2009-2012

Table 2

	Anal Sex (N = 298)		Vaginal Sex (N = 64)	
	P	95% CI	P	95% CI
Condom Errors				
When you used condoms during sex, how often was/did.....				
The condom package not checked for visible damage before having sex	45.3	39.6 – 51.0	46.9	34.3 – 59.4
The condom on the wrong side up so that it had to be flipped over	26.6	21.1 – 32.1	42.2	29.8 – 54.6
Space not left at the end of the condom when putting it on	47.4	41.1 – 53.6	56.3	43.8 – 68.7
Air not squeezed out of the condom after putting it on	61.3	55.0 – 67.5	73.4	62.3 – 84.6
A water-based lubricant not used	50.7	45.0 – 56.4	75.0	64.1 – 85.9
An oil-based lubricant used	51.0	45.3 – 56.7	51.6	39.0 – 64.1
The condom come in contact with sharp jewelry, fingernails, or teeth	15.4	11.3 – 19.6	32.8	21.0 – 44.6
You start having sex without a condom and then put it on later	30.0	23.8 – 36.3	43.8	31.3 – 56.2
Your partner start having sex without a condom and then put it on later	33.5	27.4 – 39.5	-	-
You start having sex with it on and then take it off before sex finished	34.6	28.1 – 41.1	48.4	35.9 – 61.0
Your partner start having sex with it on and then take it off before sex finished	33.8	27.7 – 39.8	-	-
Any Error	94.3	91.6 – 96.9	98.4	95.3 – 100.0
Condom Failure Items				
When you used condoms during sex, how often did.....				
The condom break during sex	31.2	24.9 – 37.4	46.9	34.3 – 59.4
The condom slip off during sex	28.2	22.1 – 34.3	45.3	32.8 – 57.8
The condom slip off as the penis was coming out	-	-	43.8	31.3 – 56.2
Any Failure	41.6	35.0 – 48.1	60.9	48.7 – 73.2
Erection Loss Items				
When you used condoms during sex, how often did.....				
You lose your erection while putting the condom on	44.3	37.7 – 50.9	50.0	37.4 – 62.6
You lose your erection during sex while using a condom	46.3	39.7 – 53.0	50.0	37.4 – 62.6
Any Erection Loss	55.9	49.3 – 62.4	60.9	48.7 – 73.2

Note: Condom error, failure, and erection problem items were only administered to participants who reported using a condom during vaginal sex (n=64) or anal sex with a male partner (n=298) in the past 6 months. See text for within-person comparisons among participants who engaged in both vaginal and anal sex with condom use.

Proportion of Participants Reporting Each Condom Error, Failure, and Erection Problem in the Past 6 Months During Anal Sex Stratified by Race: Young Men Who Have Sex With Men Aged 16-20 Years, Chicago, IL, 2009-2012

Table 3

	Black (N = 154)		Hispanic (N = 63)		White (N = 54)	
	P	95% CI	P	95% CI	P	95% CI
Condom Errors						
When you used condoms during sex, how often was/did.....						
The condom package not checked for visible damage before having sex	44.8	36.9 - 52.7	46.0	33.4 - 58.7	48.1	34.4 - 61.9
The condom on the wrong side up so that it had to be flipped over	30.5	22.5 - 38.5	16.3	5.6 - 27.1	27.1	14.0 - 40.1
Space not left at the end of the condom when putting it on	51.1	42.5 - 59.8	44.9	30.5 - 59.3	41.7	27.2 - 56.1
Air not squeezed out of the condom after putting it on	62.7	54.1 - 71.3	63.0	48.6 - 77.5	58.7	43.9 - 73.5
A water-based lubricant not used	48.1	40.1 - 56.0	58.7	46.2 - 71.2	44.4	30.8 - 58.1
An oil-based lubricant used ^{a, b}	59.7	51.9 - 67.6	44.4	31.8 - 57.1	29.6	17.0 - 42.2
The condom come in contact with sharp jewelry, fingernails, or teeth ^b	17.5	11.5 - 23.6	6.3	0.2 - 12.5	14.8	5.0 - 24.6
You start having sex without a condom and then put it on later ^{a, c}	39.1	29.8 - 48.4	29.3	14.7 - 43.8	7.1	0.0 - 15.3
Your partner start having sex without a condom and then put it on later ^a	38.8	29.8 - 47.8	30.8	17.8 - 43.7	20.8	8.9 - 32.8
You start having sex with it on and then take it off before sex finished ^c	35.5	26.3 - 44.7	45.2	29.5 - 60.9	23.8	10.4 - 37.2
Your partner start having sex with it on and then take it off before sex finished	37.0	28.2 - 45.8	27.5	14.8 - 40.1	26.0	13.4 - 38.6
Any Error	96.1	93.0 - 99.2	95.2	89.8 - 100.0	88.9	80.2 - 97.5
Condom Failure Items						
When you used condoms during sex, how often did.....						
The condom break during sex ^a	38.3	29.0 - 47.7	28.9	15.1 - 42.7	16.3	4.8 - 27.8
The condom slip off during sex ^{a, c}	29.0	20.2 - 37.7	35.7	20.6 - 50.8	13.6	3.1 - 24.2
Any Failure ^{a, c}	46.8	37.3 - 56.3	46.7	31.5 - 61.8	24.4	11.4 - 37.5
Erection Loss Items						
When you used condoms during sex, how often did.....						
You lose your erection while putting the condom on	49.1	39.8 - 58.4	37.2	22.2 - 52.3	38.1	22.8 - 53.4
You lose your erection during sex while using a condom ^{a, b}	55.3	46.0 - 64.5	35.7	20.6 - 50.8	35.7	20.6 - 50.8

	Black (N = 154)			Hispanic (N = 63)			White (N = 54)		
	P	95% CI		P	95% CI		P	95% CI	
Any Erection Loss ^{a, b}	64.1	55.3 - 72.9		44.2	28.7 - 59.7		45.2	29.5 - 60.9	

Note: Results are for only Black, Hispanic, and Latino participants who reported using a condom during anal sex with a male partner in the past 6 months (n=271).

^a Chi-square test indicates significant differences between Black and White participants.

^b Chi-square test indicates significant differences between Black and Hispanic participants.

^c Chi-square test indicates significant differences between Hispanic and White participants.

Table 4
Adjusted Odds Ratios for Condom Error, Failure, and Erection Problem Associations with STI and HIV Prevalence: Young Men Who Have Sex With Men Aged 16-20 Years, Chicago, IL, 2009-2012

	STI		HIV	
	AOR	95% CI	AOR	95% CI
Condom Error Items				
When you used condoms during sex, how often was/did.....				
The condom package not checked for visible damage before having sex	1.51	0.70 – 3.25	0.65	0.28 – 1.54
The condom on the wrong side up so that it had to be flipped over	1.32	0.54 – 3.20	1.19	0.45 – 3.15
Space not left at the end of the condom when putting it on	0.86	0.37 – 1.99	0.58	0.23 – 1.47
Air not squeezed out of the condom after putting it on	1.06	0.43 – 2.61	0.98	0.39 – 2.41
A water-based lubricant not used	0.80	0.37 – 1.71	1.05	0.46 – 2.38
An oil-based lubricant used	1.43	0.65 – 3.17	2.60	1.04 – 6.51
The condom come in contact with sharp jewelry, fingernails, or teeth	1.50	0.58 – 3.92	1.03	0.34 – 3.09
You start having sex without a condom and then put it on later	1.42	0.54 – 3.70	2.31	0.84 – 6.33
Your partner start having sex without a condom and then put it on later	0.96	0.38 – 2.47	0.97	0.36 – 2.58
You start having sex with it on and then take it off before sex was finished	2.09	0.86 – 5.09	0.55	0.18 – 1.67
Your partner start having sex with it on and then take it off before sex finished	1.62	0.63 – 4.21	0.63	0.22 – 1.78
Any Error	1.00	0.17 – 5.80	0.87	0.14 – 5.20
Condom Failure Items				
When you used condoms during sex, how often did.....				
The condom break during sex	2.84	1.19 – 6.73	1.27	0.48 – 3.40
The condom slip off during sex	3.13	1.29 – 7.59	3.11	1.15 – 8.41
Any Failure	3.27	1.31 – 8.12	1.99	0.74 – 5.33
Erection Loss Items				
When you used condoms during sex, how often did.....				
You lose your erection while putting the condom on	0.92	0.38 – 2.24	0.75	0.29 – 1.92
You lose your erection during sex while using a condom	0.95	0.39 – 2.34	0.44	0.17 – 1.19
Any Erection Loss	1.01	0.42 – 2.46	0.46	0.18 – 1.20

Note: Condom error, failure, and erection problem items were only administered to participants who reported using a condom during anal sex with a male partner (n=298) in the past 6 months. Odds ratios are adjusted for age, race, and number of male unprotected anal sex partners.

Adjusted Odds Ratios for Condom Error Associations with Condom Failures: Young Men Who Have Sex With Men Aged 16-20 Years, Chicago, IL, 2009-2012

Table 5

Condom Error Items	Condom Failure (Break or Slip Off)	
	AOR	95% CI
When you used condoms during sex, how often was/did.....		
The condom package not checked for visible damage before having sex	1.63	0.94 – 2.84
The condom on the wrong side up so that it had to be flipped over	2.34	1.22 – 4.51
Space not left at the end of the condom when putting it on	1.89	1.05 – 3.42
Air not squeezed out of the condom after putting it on	1.14	0.61 – 2.13
A water-based lubricant not used	1.24	0.71 – 2.15
An oil-based lubricant used	2.96	1.65 – 5.30
The condom come in contact with sharp jewelry, fingernails, or teeth	2.25	1.05 – 4.78
You start having sex without a condom and then put it on later	3.20	1.62 – 6.29
Your partner start having sex without a condom and then put it on later	1.68	0.85 – 3.36
You start having sex with it on and then take it off before sex was finished	3.73	1.98 – 7.03
Your partner start having sex with it on and then take it off before sex finished	3.60	1.73 – 7.50
Any Error	2.49	0.55 – 11.22

Note: Condom error and failure items were only administered to participants who reported using a condom during anal sex with a male partner (n=298) in the past 6 months. Odds ratios are adjusted for age, race, and number of male unprotected anal sex partners.