TECHNICAL REPORT

Barrier Protection Use by Adolescents During Sexual Activity
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Rates of sexual activity, pregnancies, and births among adolescents have continued to decline during the past decade to historic lows. Despite these positive trends, many adolescents remain at risk for unintended pregnancy and sexually transmitted infections (STIs). This technical report discusses the new data and trends in adolescent sexual behavior and barrier protection use. Since 2017, STI rates have increased and use of barrier methods, specifically external condom use, has declined among adolescents and young adults. Interventions that increase availability of or accessibility to barrier methods are most efficacious when combined with additional individual, small-group, or community-level activities that include messages about safer sex. Continued research informs public health interventions for adolescents that increase the consistent and correct use of barrier methods and promote dual protection of barrier methods for STI prevention together with other effective methods of contraception.

abstract

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Dr Grubb, along with the Committee on Adolescence, researched, conceived of, designed, analyzed and interpreted data for, drafted, and revised this technical report and approved the final manuscript as submitted.

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FUNDING: No external funding.

To cite: Grubb LK. AAP COMMITTEE ON ADOLESCENCE. Barrier Protection Use by Adolescents During Sexual Activity. Pediatrics 2020;146(2):e2020007245

FINANCIAL DISCLOSURE: The author has indicated she has no financial relationships relevant to this article to disclose.
In 2017, the year for which the most recent data are available, 456,000 adolescent and young women younger than 20 years became pregnant; 448,000 of those pregnancies were among 15- to 19-year-olds, and 7400 were among those 14 years of age and younger. In 2017, the US pregnancy rate among 15- to 19-year-olds was at its lowest point in at least 80 years; however, the birth rate for US teenagers remains higher than that for other industrialized nations, with marked disparities by race and/or ethnicity and geographic area.4

New cases of STIs increased 31% in the United States from 2013 to 2017, with half of the 2.3 million new STIs reported each year among young people 15 to 24 years of age.3,5,6 The CDC does not publish specific data on STI rates by modes of transmission. The rate of reported cases of chlamydia, gonorrhea, and syphilis increased for both sexes in both the adolescent (15–19 years of age) and young adult (20–24 years of age) age groups between 2012 and 2016. For chlamydia and gonorrhea, rates are consistently highest among adolescent and young women 15 to 24 years of age; however, the rate of reported chlamydia in male patients increased, whereas the rate in female patients decreased from 2012 to 2016.3 Reported cases of syphilis have been consistently higher among adolescent and young adult men compared with women, and between 2012 and 2016, rates of reported syphilis cases increased substantially in both adolescent and young adult men and women.6

Because trichomoniasis (Trichomonas vaginalis infection) is not a reportable disease, it is difficult to determine the prevalence among adolescents. In the United States, there are approximately 7 million new cases of trichomoniasis each year; and prevalence rates range from 3% in a nationally representative sample of women to 14% in adolescents.7,8

An estimated 50,900 youth had HIV infection in 2016, representing 4% of all people with HIV infection. Of those, an estimated 56% were aware of their infection, and people 15 to 24 years of age were the least likely to be aware of their infection compared with any other age group.9 Young people (13–24 years of age) accounted for an estimated 21% of all new HIV diagnoses in the United States in 2018, totaling 7891 people, of whom 87% were natal male youth and 13% were natal female youth.10 The CDC attributed 80% of new HIV diagnoses among youth to male-to-male sexual contact and 20% to other means (vaginal-penile sexual contact, intravenous drug use, dual male-to-male sexual contact, intravenous drug use, and other). Among young women who received an HIV diagnosis, the CDC attributed 85% of those infections to vaginal-penile contact and 15% to other transmission methods.10 There is a paucity of data for transgender adolescents, but the results from the National HIV Surveillance System 2009–2014 revealed that youth 13 to 19 years of age accounted for 8% of new HIV diagnoses among transgender people.10–12 The study also revealed that 25% of transgender women were living with HIV infection and that the percentage of transgender people who received a new HIV diagnosis was more than 3 times the national average in 2015.13 In 2018, 1252 youth received a diagnosis of AIDS.14

In discussing barrier methods and risks, it is important to include information about youth living with HIV acquired through perinatal transmission (PHIV). The CDC does not report specific adolescent data, but at the end of 2016, 1814 children were living with PHIV, and 10101 adults and adolescents (13 years of age and older) were living with PHIV.15 Youth with HIV infection generally receive combination antiretroviral therapy (a combination of 3 or more drugs that stops the virus from making copies of itself in the body), and concern exists for extensive drug-resistant strains if these youth are not taking combination antiretroviral therapy consistently.16 In a prospective cohort study of the reproductive health of sexually active female adolescents with PHIV, the cumulative incidence of pregnancy at 19 years of age was 21%, and incidence of STIs was 26%.17,18 Several studies have revealed that adolescents with PHIV have higher rates of sexual activity, multiple partners, and unprotected penetrative intercourse compared with noninfected peers; more adolescents frequently tested positive for multidrug-resistant HIV and rarely disclosed their HIV status to partners.19,20 Adolescents with intellectual and physical disabilities are an overlooked group when it comes to sexual behavior, but they have similar rates of sexual behaviors when compared with their peers without disabilities.20 These youth receive limited sexual education from their parents and pediatricians because many assume they will not engage in sexual behaviors.21 The American Academy of Pediatrics clinical report “Sexuality of Children and Adolescents With Developmental Disabilities” provides additional information.22

This information concerning adolescent pregnancy, STIs and/or HIV, and minority youth is provided to emphasize the need for comprehensive barrier method counseling and education for all youth, regardless of stated sexual orientation, behaviors, gender, or intellectual and/or physical differences.

**BARRIER METHOD USE**

**Recent Trends in Adolescent Barrier Method Use**

The external condom remains the most popular contraceptive method.
among adolescents. Most reported barrier method use data are for the external condom because there is a paucity of current available data for other barrier methods. The 2017 YRBS data refer to external condoms and vaginal-penile sexual activity. Although overall sexual activity decreased among high school students, barrier method use (referred to as condom use in the YRBS) also declined among sexually active adolescents. Among sexually active high school students, 54% reported condom use during their last sexual encounter, a decline from 62% in 2007. Among 12th-grade students, 57% reported ever being sexually active, but they had the lowest use of condoms among all grades. The prevalence of having used a condom during the last sexual intercourse was higher among male than female students, and use rates were as follows: white male students, 62%; Black male students, 58%; Hispanic male students, 62%; white female students, 47%; Black female students, 46%; and Hispanic female students, 47%. Use rates declined with increasing grade level. Among currently sexually active students, 56% of self-identified heterosexual students; 40% of self-identified gay, lesbian, and bisexual students; and 44% of questioning students used a condom during the last sexual intercourse. The prevalence of having used a condom during the last sexual intercourse was higher among heterosexual (56%) than sexual-minority (40%) students. Among female students, the prevalence of having used a condom during the last sexual intercourse was higher among heterosexual students (50%) than lesbian and bisexual students (37%), and among male students, the prevalence was higher among heterosexual students (62%) than gay and bisexual students (53%). The prevalence of having used a condom at last sexual intercourse was also higher among heterosexual male students (62%) than heterosexual female students (50%). In one study, approximately one-third of transgender female youth reported not using barrier methods consistently during receptive anal intercourse with casual and commercial partners; less than half consistently used them with a main partner.

The National HIV Behavioral Surveillance interviewed individuals in 23 cities, and among HIV-negative males who have sex with males (MSM) 18 to 24 years of age, 10% reported having condomless vaginal sex with female partners, 3.5% reported having condomless anal sex with female partners (3.5%), and 73% reported having condomless anal sex with male partners. Among HIV-positive MSM, 7% reported having condomless vaginal sex with female partners, 3% reported having condomless anal sex with female partners, and 74% reported having condomless anal sex with male partners. Rates of actual barrier method use in surveys also may be lower than reported because of the uncertain or questionable validity of self-report of this and other sexual behaviors that are prone to bias. For example, in a clinic-based sample of Black female participants 15 to 21 years of age in Atlanta, Georgia, 186 young women reported 100% condom use via an audio computer-assisted self-interviewing technique. In these young women, 34% had a positive biological marker for unprotected vaginal sex (a Y chromosome polymerase chain reaction assay) in the past 14 days. As a possible explanation of these findings, participants may have used condoms inconsistently or incorrectly, or youth might have provided socially desirable answers.

The rate of barrier method use is significantly less for oral intercourse. Using data collected from 3816 cisgender female participants and 3520 cisgender male participants in the 2011–2015 National Survey of Family Growth, the authors found, for adolescents and young adults 15 to 24 years of age, that 58% of male participants and female participants reported having at least 1 oral opposite-sex partner in the last 12 months. Condom use at the last oral sex was 8% for female participants and 9% for male participants. Black male participants (adjusted odds ratio [aOR] 3.46), Black female participants (aOR 2.65), and female participants of other races and/or ethnicities (aOR 2.40) were more likely to use a condom at the last oral sex. Women 20 to 24 years of age (aOR 0.31), women whose mothers had a college education or more (aOR 0.43), and men and women who reported no intercourse experience were less likely to use a condom at the last oral sex (aORs 0.46 and 0.20, respectively).

Factors That Influence Barrier Method Use

Several factors, including individual, family, cultural, sociodemographic, attitude, education, relationship, and partner-related factors, influence barrier method use (Table 1). In the most current national study of male adolescents, factors associated with greater consistency of barrier method use included Black race or ethnicity, more positive attitudes toward barrier methods, and more discussion of health topics with parents. Adolescents who did not have formal sex education were half as likely to use a barrier method at first intercourse and even less likely to use barrier methods consistently. A lower rate of barrier method use at first sexual intercourse was associated with older age, an older or casual first sexual partner, and a partner using another method of contraception. These factors were also associated with a lower rate of barrier method use at last sex, except for having a casual sexual partner, which was associated with a higher rate of barrier method use. In a large study of rural adolescents, authors found
that sexually active students who used barrier methods had significantly higher levels of knowledge about sexual risk, self-esteem, personal standards for barrier method use, self-efficacy (an individual’s belief in his or her capacity to execute behaviors necessary to produce specific performance attainments) for barrier method use, self-efficacy for partner communication, self-efficacy for refusal of unwanted intercourse, barrier method use goals, and perceived norms and lower levels of worry about pregnancy compared with students who did not use barrier methods. Adolescents using barrier methods reported significantly higher levels of perceived support from their family, and the perceived level of support received from friends or from significant others did not differ between those who used barrier methods and those who did not.30

Relationship factors play an important role in barrier method use among adolescents. In the Toronto Relationship Study,31 authors found that negative relationship dynamics (conflict, control, mistrust, jealousy, perceived partner inferiority) and positive qualities (love, enmeshment, salience, self-disclosure) were associated with consistent barrier method use. Teenagers who scored highly on both positive and negative qualities had the least consistent barrier method use. Conversely, teenagers in relationships with low positive and negative qualities had the most consistent barrier method use. Relationship duration was negatively associated with consistent barrier method use.31 Another study revealed higher rates of barrier method use in youth who perceived their partners as wanting to use barrier methods and in those able to communicate their desire to use barrier methods with their partners.32 Lack of barrier method use by adolescents is also associated with perceptions that barrier methods reduce sexual pleasure and/or that partners disapprove of barrier method use. This perception was supported by one large study that revealed that perceptions about how barrier methods reduce sexual pleasure were more strongly associated with not using a barrier method.33 Other factors associated with increased barrier method use include receiving comprehensive sex and HIV education programs,34 attending schools where barrier methods are available,35,36 and perceived risk of getting STIs.34

In several studies, authors have examined the role of parent-adolescent communication about sexual risk and the association with increased adolescent use of barrier methods.37–39 Parental communication about sexual risk and barrier method use is associated with increases in adolescents’ use of barrier methods, especially at first intercourse. Timing of the discussion is important; in one study, the highest rates of barrier method use at first and last sex, as well as for regular use, were found among adolescent girls who communicated with their mothers about barrier method use before onset of sexual activity, as compared with after initiation.40 In the most recent longitudinal study of parents and their children regarding the timing of parent and child communication about sexual behaviors, more than 40% of the children had intercourse before there were discussions about STI symptoms, barrier method use, birth control, or partner barrier method refusal.41,42

In a randomized clinical trial of Hispanic and Black mother-adolescent (11–14 years of age) dyads, mothers waiting in a pediatric clinic received a parent-based intervention. The intervention group demonstrated significantly reduced rates of transitioning to sexual activity and frequency of sexual intercourse, with decreases in oral sex nearly reaching statistical significance (P < .054), compared with controls. Specifically, sexual activity increased from 6% to 22% for adolescents in the standard of care control condition, although it remained at 6% among adolescents in the intervention condition at the 9-month follow-up.42 The media also may influence adolescent sexual behavior.43,44 Exposure to sexual content in music, movies, magazines, television, and the Internet may play an important role in adolescent sexual activity. Despite the increasingly sexually explicit material in media and programming, there are rare messages promoting responsible sexual activity, such as contraception use (including condom use).25 In primetime television, 77% of programs have sexual content, but only 14% reference risks or responsibility of sexual behavior.44 Substance use also affects sexual behavior and barrier use. In studies of young adult and adolescent sexual behavior after use of alcohol, marijuana, or other illicit substances (including nonmedical use of

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prescription drugs), authors found associated increases in risky sexual behavior and lower rates of barrier protection use.45–47

Barrier availability may significantly affect use among adolescents. External condoms, dental dams, and barrier sheets are available over the counter in all states but may still be difficult for adolescents to access. Many stores stock condoms in physically inaccessible places that require a store attendant to assist the customer.58 Barrier methods can be expensive, and private insurance does not pay for them, but some states’ Medicaid plans do.49 Barrier methods are less available in poorer neighborhoods,50 rural areas, American Indian or Alaska Native communities,51,52 and certain faith-based communities or colleges or universities.53

Sexual-minority youth may have different patterns of barrier use, but there are limited data on their habits. Sexual-minority youth may not use barriers during sexual activity for similar reasons as their heteronormative peers, but they often have unique explanations. In a study of women who have sex with women (40% of participants were 24 years of age or younger), the percentage of women who reported never using barrier protection was significantly higher among those in monogamous relationships than among those in nonmonogamous relationships (78.6% vs 27.4%, respectively; P < .01).54 Women who reported always using barrier protection were significantly more likely to be in nonmonogamous than monogamous relationships (14.3% vs 3.5%, respectively; P < .01). Of note, 27.7% of nonmonogamous women reported using barrier protection with their secondary partners only. Overall, most of the study population (83%–88%) reported never using barrier protection when performing and receiving digital sex or when performing and receiving oral sex.

Barrier use was slightly more prevalent in the context of genital stimulation with a sex toy, with 62.1% and 63.4% of respondents reporting that they never used barrier protection when performing and receiving this type of stimulation, respectively.55

In a qualitative study of lesbian and bisexual female participants 14 to 18 years of age, reasons participants did not use latex barriers (external condom or dental dam) during sex with female partners included pleasure, risk perception based on sex of sexual partner, lack of knowledge of sexual risk or of barrier use for female-to-female sexual activities, and use of STI testing as a prevention tool.56 One 17-year-old girl shared, “they [other girls] probably don’t think [about barriers] since condoms are seen as a way to prevent pregnancy, and when two girls have sex they can’t get pregnant so we forget that there’s still a chance of STDs.” Additionally, participants cited greater trust with female partners, no concern for pregnancy, lack of awareness of importance, and lack of inclusive sexuality education.

Among MSM, there are a variety of reasons for barrier use behaviors. In a survey of adolescent MSM,56 most received sexual education from parents and school, but they lacked information on specific or explicit information concerning male-to-male sexual activity (eg, types of male-to-male sex, how to safely and comfortably have anal sex). For MSM, relationship to partner correlates with condom use. For HIV-negative MSM 18 to 24 years of age, 52% reported condomless anal sex with a main male partner; compared with 44% with casual male partners. In the same survey, 55% of HIV-positive MSM reported condomless anal sex with a main partner; compared with 41% with a casual partner.25 In a large Internet study of adolescent MSM, participants reported increased likelihood of condom use with casual partners and first-time partners and associated higher perceived pleasure with condom use.57 Participants’ condom use was less likely if their partners did not ejaculate, when they had sex in a location other than a residence, or with higher levels of preintercourse arousal or erection difficulty. In a study of Black MSM, authors found that participants used perceived masculinity of potential partners to assess HIV-related risk, in which masculine men were presumed low risk and effeminate men were presumed high risk, thus contributing to condom use behavior.58

**Dual Protection**

Nonbarrier contraceptive methods offer pregnancy protection but no protection against STIs. Dual-method use, the use of barriers in combination with other contraceptive methods to protect against STIs and unwanted pregnancy, is the ideal contraceptive practice for adolescents. The 2017 YRBS revealed that 9% of all male and female high school students reported dual contraceptive use (defined as external condom use with another contraceptive method) with the last intercourse.23 The overall percentage of dual usage increased with age, up to 10% among 12th-graders, and was highest among white (12%), Black (6%), and Hispanic (4%) students. Studies have revealed beliefs that positively correlate with dual contraceptive use, including perceived benefits of protected sex, positive attitudes about birth control, and higher perceived risk of STI and pregnancy consequences.59 Additionally, predictors of dual-method use are similar to predictors of adolescent barrier use (Table 1). Younger age at first coitus, older partner age, history of sexual abuse, lower self-esteem, and obesity are predictive of inconsistent use and nonuse of barrier methods. Longer relationship duration is also predictive of lower barrier-only or...
dual-method use but not of overall contraceptive use, even after controlling for age. Adolescents with main and regular partners tend to discontinue use of barriers quickly, especially if they are using other pregnancy prevention methods.

Because adolescents have increased their use of long-acting reversible contraceptive (LARC) methods, there are concerns about their effects on adolescent use of barrier protection. LARCs are considered the best form of contraception for adolescents wishing to avoid pregnancy, but they offer no protection against STIs. An analysis of YRBS cross-sectional data revealed that among 2288 sexually active female participants, 2% used LARCs; 6% used depot medroxyprogesterone acetate injection, the ethinyl estradiol and norelgestromin patch, or the etonogestrel and ethinyl estradiol vaginal ring; 22% used oral contraceptives; 41% used condoms; 12% used withdrawal or another method; 16% used no contraceptive method; and 2% were not sure. LARC users were approximately 60% less likely to use barriers compared with oral contraceptive users. Authors did not find significant differences in condom use between LARC users and depot injection, patch, or ring users, but LARC users were more than twice as likely to have 2 or more recent sexual partners compared with oral contraceptive, depot injection, patch, or ring users. In a secondary analysis of the Contraceptive Choice Project, authors found that LARC use was associated with increased acquisition of an STI within the first 12 months after placement compared with no use of LARCs. These findings suggest that adolescents using other contraceptive methods besides barriers may be engaging in risk compensation, the adjustment of behavior in response to perceived level of risk.

**Preexposure Prophylactic Therapy and Barrier Use**

For individuals at increased risk for HIV acquisition (sexually active MSM, individuals with an HIV-positive partner, those engaging in anal intercourse, those engaging in frequent sex without a barrier, or those with a high number of sexual partners), the CDC recommends preexposure prophylaxis (PrEP) to reduce HIV acquisition and transmission. The US Food and Drug Administration (FDA) has approved both emtricitabine and tenofovir disoproxil fumarate and emtricitabine and tenofovir alafenamide for PrEP in adults and adolescents who weigh at least 35 kg. The CDC Web site provides HIV risk behavior assessment, PrEP clinical practice guidelines, patient and provider education, and tool kits. PrEP can reduce the risk of HIV acquisition by 90% when people use it consistently. With the increase in PrEP use, researchers have documented significant declines in barrier use and increases in STIs among MSM (cisgender males and transgender females), suggesting that PrEP users may be engaging in risk compensation.

**Effectiveness of Barrier Method Use**

Most studies of barrier method effectiveness involve external condoms. External condoms consist of 3 types of materials: most (>80%) are latex (natural rubber), a small percentage (less than 5%) are natural membrane (lamb cecum), and approximately 15% are synthetic (eg, polyurethane). The CDC only recommends latex and synthetic condoms for prevention of STIs and HIV because natural-membrane condoms contain small pores that may allow for passage of viruses, including HIV, hepatitis B virus, and herpes simplex virus. In a recent Cochrane review, authors concluded that nonlatex synthetic condoms were linked with higher rates of clinical breakage than their latex counterparts. The synthetic (AT-10 resin, polyisoprene, polyethylene, or polyurethane) condoms still provide an acceptable alternative for individuals with allergies, sensitivities, or preferences that might prevent the consistent use of latex condoms. The polyurethane condom is not as effective as the latex external condom for pregnancy prevention. Synthetic barrier methods are compatible with both oil- and water-based lubricants, and although not extensively studied, synthetic external condoms are believed to provide STI protection similar to external latex condoms; however, FDA labeling currently restricts their recommended use to latex-sensitive or latex-allergic people. In the United States, the FDA regulates external condoms and barrier methods (dental dams) marketed to prevent STIs as medical devices, and stringent manufacturing standards exist to ensure testing of each barrier for holes or weak spots before sale.

External condoms can be effective against unintended pregnancy when used consistently and correctly. External condom failure rates have declined significantly since 1995, from 18% to 13% with typical use, according to the National Survey of Family Growth (2006–2010). Researchers estimate that the failure rate of the external condom for pregnancy is 2% in 12 months of perfect use (ie, 2 pregnancies per 100 woman-years). The most important noncontraceptive benefit of external condom use is the additional protection against acquisition and transmission of STIs, including HIV. If the user places the external condom on the penis before genital, oral, anal, or skin contact and uses it throughout activity, this should prevent contact with semen, vaginal secretions,
saliva, blood, skin and mucosal lesions, and infectious secretions. External condoms greatly reduce the risk of STI transmission to or from the penile urethra, including gonorrhea, chlamydia, trichomoniasis, hepatitis B virus, and HIV.80–88 Barrier methods also provide protection against STIs transmitted via skin-to-skin contact or contact with mucosal surfaces in those covered areas, including genital herpes simplex virus, human papillomavirus, syphilis, and chancroid; all published studies refer to the external condom.89–91 The latex condom effectively blocked passage of the smallest sexually transmitted pathogen, hepatitis B virus, according to in vitro studies.91 In most studies on external condom effectiveness, vaginal-penile sexual activity is evaluated. Adolescents can also use either a latex or synthetic barrier during anogenital and orogenital intercourse to reduce the risk of STIs.

Well-designed epidemiological studies and those of couples with discordant HIV infection status have revealed that external condoms are highly effective against transmission of HIV. Researchers conducted a meta-analysis of studies comparing seroconversion rates among couples who regularly used external condoms and those who used them inconsistently to determine their use and/or effectiveness in preventing HIV transmission. Results of the analysis revealed that external condoms were 90% to 95% effective in preventing HIV transmission when opposite- and same-sex partners used them consistently.100

Given the coital-dependent nature of barrier methods, the degrees of consistency and correctness of use influence effectiveness against both unintended pregnancy and STIs. Factors associated with decreased effectiveness include failure to use a barrier with every act of intercourse, incomplete use (late application and early removal), improper use, barrier breakage and slippage, not using a new barrier when switching from one form of sex to another, barrier method–associated erection problems (either during application or during intercourse), and problems with the fit or feel of barriers, including problems related to the size or shape of the barrier or discomfort or interference with sensation.92,93

The internal condom (formerly female condom) is a loose-fitting polyurethane (nitrile) sheath with 2 flexible polyurethane rings and is the only FDA-approved nonpenile barrier method for STI prevention currently available in the United States.94 The FDA regulates the internal condom as a level III product, on par with medical devices such as pacemakers, thus making manufacturing and distribution more challenging in the United States. The FDA approved the original device (brand name FC1) in 1993 and the revised product (brand name FC2) in 2009. In September 2018, the FDA petitioned to reclassify the female condom as a level II device and renamed it the internal condom.95 This proposed change would increase access to internal barrier methods in the United States and broaden use, especially when it comes to the lesbian, gay, bisexual, transgender, and questioning community, because an increasing number of people have begun to use this method for nonvaginal intercourse. The FC2 device is the only internal condom available in the United States. Recently, the FC2 manufacturer, Veru, decided to take the FC2 off of pharmacy shelves and make it available exclusively through prescription with the rationale that by doing so, they would ensure that women with health insurance can access them free of charge under the Patient Protection and Affordable Care Act’s mandate for contraceptive coverage.96 There are no published data on the effects of this change.

Data regarding contraceptive effectiveness of FC1 internal condoms suggest that estimated rates of pregnancy during the first 12 months of perfect use and typical use are 5% and 21% respectively; these pregnancy rates are slightly higher than those of the external condom. Although available data suggest that internal condoms may provide similar degrees of protection against pregnancy and STIs as do latex external male condoms alone, this conclusion has not been demonstrated, and thus comparative research is needed.61 Overall internal condom use accounts for less than 1% of US barrier use overall.97 Adolescents may also use dental dams, latex sheets, or improvised barriers to protect against STIs and pregnancy. Published data on the effectiveness of these barrier methods are unavailable, but the CDC does provide proper-use information on its Web site.98

**EFFORTS AIMED AT INCREASING BARRIER METHOD USE**

In a review of the literature, authors found contradicting evidence on the effectiveness of community- and behavioral-level barrier method promotion programs, highlighting the need for further evaluation of program effectiveness.63,64,99,100 One large-scale review revealed concern that these programs might hasten the initiation of sex, but this concern appears unfounded.65 In the 52 studies measuring timing of initiation of sex, 42% found that sexual initiation was significantly delayed for at least 6 months after participation in such a program, and 55% found no effect. There are few programs promoting enhanced sexual pleasure as a motivating factor, which
has led to increased uptake of barrier methods and safer sex behaviors.101–103

In 2017, the Society for Adolescent Health and Medicine published a position statement, “Condom Availability in Schools: A Practical Approach to the Prevention of Sexually Transmitted Infection/HIV and Unintended Pregnancy,” recommending increased barrier method availability at schools.35 The evidence on the impact of availability of barrier methods in schools is inconsistent.104–107 In the most recent study of programs in Massachusetts high schools, adolescents attending schools where barrier methods were available were more likely to receive barrier method use instruction and less likely to report lifetime or recent sexual intercourse, and adolescents who were sexually active were twice as likely to use barrier methods at the most recent sexual encounter.108 Studies have revealed that school condom programs do not increase sexual activity, the number of sexual partners, or risk behaviors.109,110

Likewise, clinic-based interventions have been effective in increasing barrier method use and decreasing STIs.111,112 The CDC publishes a summary: “Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention.”113

In a recent meta-analysis of high-quality US and international studies of structural-level barrier method distribution interventions, authors found significant effects on increased barrier method use, increased barrier method acquisition, increased barrier method carrying, delayed sexual initiation of youth, and reduced incidence of STIs.114 The interventions that increase availability of or accessibility to barrier methods are most efficacious when combined with additional individual, small-group, or community-level activities. The intervention effects were significant across target participant characteristics (youth, adults, commercial sex workers, STI clinic populations, or male participants). In a large systematic review of the literature, authors found that interventions using constructs of the information, motivation, and behavioral skills model were associated with significant increases in condom use or condom-use intentions.115 Additionally, interventions that included modules to increase self-efficacy for condom use and that taught participants where to obtain condoms and how to negotiate condom use with partners or elicit positive associations (feelings) toward condoms were associated with increased condom use or intention to use condoms.

Social networks may promote barrier use as well. In a study of homeless youth, those who had a condom-using peers reported increased condom use and reduced risky behavior.116 In a large review of network-based condom intervention strategies, authors of all studies reported substantial improvement in condom use for the intervention groups compared with the control groups.117 Social media platforms also provide information and promote safer sexual practices, including barrier use.118 Study authors reported small short-term gains in condom use or consumption but mixed long-term behavioral effectiveness.117,119,120

Availability of barrier methods in the pediatrician’s office may reduce obstacles to use for adolescents, but a survey of primary care providers revealed that most do not distribute condoms in their practices.121 Providers cited the following risks to distribution of condoms: potential for parent or caregiver disproval (66%), potential of upsetting or offending patients (28%), possibility of preventing adolescents from developing self-reliance (11%), and potential of promoting sexual activity (7%). Of those who did not distribute condoms, the most cited reasons included unsure and had not thought about it (45%), inconvenience (31%), and concern for parent or caregiver disproval (27%). Ninety percent of providers endorsed that they would or may be willing to consider office-based condom distribution if they had help with organizing and funding this service.

To enhance safer sex and proper barrier usage, it is important for adolescents to receive comprehensive, evidence-based, and medically accurate sexual education that includes barrier method instruction. A review of states’ sexuality education programs revealed that 16 states require instruction on barrier methods or contraception with sexuality or HIV and/or STI education.122 Additionally, adolescents need affordable access to barrier methods without discrimination or other barriers. Most barrier methods are sold over the counter in all 50 states and territories, but obstacles persist, including barriers displayed behind counters or in locked cabinets, store or pharmacy personnel refusing to sell to adolescents of certain ages, cost, and poor availability in some neighborhoods.

CONCLUSIONS
Recent trends in adolescent and young adult sexual behavior reveal that adolescents and young adults remain at risk for unintended pregnancies, STIs, and HIV. When adolescents and young adults use barrier methods consistently and correctly, these methods are excellent means to reduce the risk of many
STIs, including HIV, and prevent pregnancy.

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POTENTIAL CONFLICT OF INTEREST: The author has indicated she has no potential conflicts of interest to disclose.

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ABBREVIATIONS
aOR: adjusted odds ratio
CDC: Centers for Disease Control and Prevention
FDA: US Food and Drug Administration
LARC: long-acting reversible contraceptive
MSM: males who have sex with males
PHIV: HIV acquired through perinatal transmission
PrEP: preexposure prophylaxis
STI: sexually transmitted infection
YRBS: Youth Risk Behavior Survey

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