

Condom Use by Adolescents

ABSTRACT. The use of condoms as part of the prevention of unintended pregnancies and sexually transmitted diseases (STDs) in adolescents is evaluated in this policy statement. Sexual activity and pregnancies decreased slightly among adolescents in the 1990s, reversing trends that were present in the 1970s and 1980s, while condom use among adolescents increased significantly. These trends likely reflect initial success of primary and secondary prevention messages aimed at adolescents. Rates of acquisition of STDs and human immunodeficiency virus (HIV) among adolescents remain unacceptably high, highlighting the need for continued prevention efforts and reflecting the fact that improved condom use can decrease, but never eliminate, the risk of acquisition of STDs and HIV as well as unintended pregnancies. While many condom education and availability programs have been shown to have modest effects on condom use, there is no evidence that these programs contribute to increased sexual activity among adolescents. These trends highlight the progress that has been made and the large amount that still needs to be accomplished.

ABBREVIATIONS. STD, sexually transmitted disease; HIV, human immunodeficiency virus; CDC, Centers for Disease Control and Prevention.

INTRODUCTION

The medical and social consequences of adolescent sexual activity are a national health concern highlighted by unintended pregnancies and the acquisition of sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV). How to best decrease pregnancy and STD rates among adolescents is the focus of much debate, with particular controversy surrounding the roles of sexuality education and condom availability for youth. From a public health perspective, primary prevention of unintended pregnancy and STDs in adolescents involves a delay in the initiation of sexual activity until psychosocial maturity or marriage, depending on the religious or cultural perspective. Secondary prevention in adolescents involves the use of safer sex practices by those who are sexually active and who do not plan on abstaining from sexual activity.

In this policy statement, the use of condoms as part of the secondary prevention of unintended pregnancies and STDs in adolescents is evaluated. The statement reviews current pregnancy, STD, and HIV in-

fection rates; recent changes in condom use by adolescents and factors affecting condom use; the types of condoms, their proper use, and their breakage rates; the effectiveness of condoms in pregnancy, STD, and HIV prevention; and the roles that schools are playing in condom education and availability for youth. This statement updates a previous statement published in 1995¹ and refers only to the male condom; information on the female condom, which is newer and not currently used by many adolescents, may be obtained from other sources.²

TRENDS IN ADOLESCENT SEXUAL ACTIVITY

Although recent data have shown encouraging signs that primary and secondary prevention efforts may be starting to have an effect, current rates of sexual activity, pregnancy, and STDs among adolescents remain a public health concern. An evaluation of data available for female and male adolescents demonstrates the changes that have taken place throughout time and ongoing reasons for concern.

Data from a series of studies demonstrated that sexual intercourse among 15- to 19-year-old adolescent females living in metropolitan areas increased significantly in the 1970s, from 37% reporting being sexually active in 1971, to 43% in 1976, to 50% in 1979.³ Smaller changes took place during the 1980s, with a series of national studies demonstrating an increase in the number of 15- to 19-year-old adolescent females who were sexually active, from 47% in 1982 to 53% in 1988.⁴ Rates decreased slightly in the 1990s, with the Centers for Disease Control and Prevention (CDC) reporting in its Youth Risk Behavior Surveys that 50% of females in grades 9 through 12 were sexually active in 1991, with an increase to 52% in 1995 and a decrease to 48% in 1999.^{5,6} As the 1990s ended, the rate of sexual activity among adolescent females in high school had remained between 47% and 53% for 2 decades.

Changes in sexual activity among adolescent males have been somewhat more dramatic. The rate of 17- to 19-year-old males living in metropolitan areas who reported having sexual intercourse in a series of national studies increased from 66% in 1979 to 76% in 1988.⁷ This was followed, however, by a second series of studies that demonstrated a decrease in the number of males 15 to 19 years old who reported having sexual intercourse, from 60% in 1988 to 55% in 1995.⁸ The CDC data demonstrate a decrease among males in grades 9 through 12 who report being sexually active, from 57% in 1991, to 54% in 1995, to 49% in 1997.⁵ The data demonstrate that, although adolescent males have had higher

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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rates than adolescent females throughout most of the past 2 decades, approximately 50% of high school students of both sexes now report having sexual intercourse.

With approximately half of all adolescents being sexually active, rates of adolescent pregnancies and STDs remain a significant concern. Approximately 900 000 adolescents become pregnant each year, with up to two thirds of these pregnancies occurring in women 18 to 19 years old and one third in women 17 years or younger.⁹ Approximately 51% of adolescent pregnancies result in a live birth, 35% end with an abortion, and 14% end with a miscarriage or stillbirth.^{9,10} Among adolescent women who are sexually active, approximately 9% of 14-year-olds, 18% of 15- to 17-year-olds, and 22% of 18- to 19-year-olds become pregnant each year, with most pregnancies described as unintended.^{11,12} The birth rate to adolescents increased 24% from 1986 to 1991 (from 50.1 to 62.1 births per 1000 females 15–19 years old) but then decreased 12% from 1991 to 1996 (from 62.1 to 54.7 births per 1000).^{12–13} The abortion rate among adolescents increased significantly from 1975 to 1980 but has decreased steadily since then (from 42.8 per 1000 females 15–19 years old in 1980 to 25 per 1000 in 1993).^{12–14} Despite these decreases, the United States continues to have the highest adolescent birth rate among all developed countries, even compared with countries that have similar or higher rates of sexual activity. Mixed messages concerning sexuality that are delivered in this country are believed to be a primary cause of this discrepancy.

Rates of STD acquisition by adolescents also remain high, and the Institute of Medicine recently recommended that “a major part of a national strategy to prevent STDs should focus on adolescents.”¹⁵ The CDC estimates that approximately 3 million adolescents acquire an STD each year, representing 25% of all new STD cases annually, and that two thirds of all individuals who acquire STDs are younger than 25 years.¹⁵ Data from published studies indicate that up to 30% of sexually active adolescent females test positive for infection with *Chlamydia* organisms; as many as 30% to 50% of sexually active adolescents have been infected with the human papillomavirus; sexually active adolescents between 15 and 19 years old have higher rates of gonorrhea than any other age group; rates of genital herpes infections are estimated to have increased more than 50%; and up to 25% of newly acquired HIV infections are estimated to occur among those who are 22 years or younger.^{11,15–20} In total, rates of adolescent sexual activity, unintended pregnancy, and acquisition of STDs remain an area of major concern.

CONDOM USE

Recent Trends in Adolescent Use

Survey data from male and female adolescents indicate a significant increase in condom use by adolescents during the past 2 decades. Among sexually active adolescent males 17 to 19 years old living in metropolitan areas, reported condom use at last in-

tercourse increased from 21% in 1979 to 58% in 1988.⁷ Reported condom use at first intercourse among adolescent women 15 to 19 years old increased from 23% in 1982 to 47% in 1988.⁴ Data from the 1988 and 1995 National Surveys of Adolescent Males indicate that these increases have continued, with reported condom use at last intercourse among 15- to 19-year-olds increasing from 57% in 1988 to 67% in 1995.⁸ The CDC data indicate increases in reported condom use at last intercourse from 38% to 51% among females and from 56% to 63% among males for those in grades 9 through 12 between 1991 and 1997.⁵

Despite noted improvements in condom use, significant problems still remain. Condom use by one half to two thirds of adolescents is not sufficient to significantly decrease rates of unintended pregnancy and acquisition of STDs. Furthermore, the data show that only 45% of adolescent males report condom use for every act of intercourse and that condom use actually decreases with age when comparing males 15 to 17 years old with males 18 to 19 years old.^{7,8} Also, females report less frequent use of condoms during intercourse than males, presumably because many adolescent females are sexually active with older partners.⁵ For these reasons, rates of pregnancies and STDs in females are unlikely to decrease beyond current levels unless condom use by adolescents and young adults continues to increase significantly in the years ahead.

Factors That Influence Use

Demographic, attitudinal, and educational factors have all been associated with increased condom use by adolescents, although studies on each of these factors are far from clear. As noted earlier, younger age has been associated with condom use in a national study of males; in that same study, black adolescents, adolescents who had more educated parents, and adolescents who were older at first intercourse also had greater condom use.⁷ A study of females demonstrated that being from an intact family and having a mother with higher educational achievement were associated with greater condom use at first intercourse,²¹ and studies have shown that increased communication with parents is also associated with increased condom use.²² Attitudes associated with increased condom use among males include having a strong belief in male contraceptive responsibility, being more worried about acquisition of HIV, believing that a partner would appreciate condom use, believing that a partner could be infected with HIV, and being less embarrassed about discussing condom use and purchasing a condom.^{23–37} Other factors associated with condom use include receiving sexuality education, accessibility of condoms for use, believing that condoms can prevent STDs and HIV infection, being able to communicate with partners about STDs and HIV, perceiving peer norms as supportive of condom use, and availability of a physician with whom to discuss condom use.^{23–37}

EFFECTIVENESS OF CONDOM USE

The effectiveness of condoms in preventing unintended pregnancy and acquisition of STDs depends on consistent and proper use and avoidance of breakage, slippage, or leakage. Despite recent trends toward increased use by adolescents, consistent condom use (ie, for all episodes of vaginal or anal intercourse) is reported by less than half of all sexually active adolescents.^{7,8} In addition, data demonstrate that effectiveness increases with experience, leaving those adolescents with the least experience at greatest risk for improper use.

Most condoms used in the United States are made of latex.^{23,38} Natural condoms (made of lamb intestine) may be permeable to microorganisms (possibly including HIV). Polyurethane condoms also have recently become available for use.^{39–40} As summarized by a CDC report, proper use of a condom requires: 1) using a new condom for each act of vaginal, oral, and anal intercourse; 2) putting the condom on correctly before any genital contact; 3) withdrawing while the penis is still erect and holding the condom firmly to keep it from slipping off; and 4) using only water-based lubricants, not those that are petroleum based (because condoms can be damaged by petroleum jelly, mineral oil, vegetable oil, cold creams, body lotions, and several antifungal medications).^{23,38,41–42} The most important errors that lead to clinical failure are breakage, slippage, and failure to use throughout intercourse.^{43–45} Other errors that can lead to condom failure include tearing or nicking the condom as the package is opened, unrolling the condom before placing it on the penis, failing to squeeze the tip of the condom as it is rolled onto the penis, delaying use of the condom until after intercourse starts, removing the condom too early (before ejaculation), and failing to hold the condom on the penis during withdrawal.²³

Problems with condom use include latex allergy, which can be decreased by using a polyurethane condom, and decreased glans sensitivity, which can partly be overcome by use of textured, ribbed, ultra-thin, or lubricated condoms.^{23,38,41,42} The female condom, which is made of polyurethane, can be used as an alternative by those with latex allergy but cannot be used together with the male condom because they adhere to each other.² Breakage and slippage rates of the male condom have each been estimated to be less than 2%, although rates vary by study and with user experience.^{42–46} Leakage attributable to faulty manufacturing is not currently considered to be a problem in the United States—efforts by the Food and Drug Administration have resulted in improved production and increased inspection in this country—but condoms imported from other countries may still be a cause for concern.^{42–46} Condoms should be stored in cool, dark places, because heat, including body heat, can cause condoms to weaken.

Problems with inconsistent use, incorrect use, breakage, and leakage clearly indicate that condoms cannot be 100% effective in preventing pregnancy, STDs, and HIV infection. The data on pregnancy prevention are relatively clear, with theoretical an-

nual failure rates (ie, pregnancy occurring during a year of use when the condom is used consistently and correctly) estimated to be 2%.⁴⁷ Actual failure rates range from 5% to 20%, depending on the age of the users.⁴⁷ Although failure rates are higher for adolescents than for older women, highest failure rates are reported to occur in women 20 to 24 years old; frequency of use and levels of fertility may play a role in these findings.³⁸ One study reported first-year failure rates as low as 2% to 4% in adolescents, demonstrating that proper use can be attained in some populations of adolescents.⁴⁸

Determining the efficacy of condom use in preventing transmission of STDs and HIV is much more complicated, because each STD must be considered individually. Several articles have reviewed the literature on this topic, with additional studies examining the effects of condom use on transmission of HIV and specific STDs.^{49–60} The literature findings can be summarized as follows:

1. Condom use appears to decrease the rate of, but does not fully eliminate, transmission of most, and possibly all, STDs to males. Protection rates of one half to three quarters (ie, relative risk ratios of one half to two thirds) have been found in several studies of *Neisseria gonorrhoeae* and *Ureaplasma urealyticum* transmission, with 2 studies demonstrating 100% protection with short-term, consistent use.⁴⁹ Less clear is the demonstration of protection against *Chlamydia trachomatis* and *Treponema pallidum* in males, and there are no definitive studies to date on protection against herpes simplex and human papillomavirus, 2 organisms that can be transmitted by skin-to-skin contact for which the condom may offer less protection.^{49–55}
2. Because a female is more likely to acquire an STD from an infected male partner than a male is from a female partner, condom use offers less protection from STD acquisition for females than for males. Studies of gonorrhea and *Trichomonas* infection demonstrate protection rates with condom use of only one third to one eighth (ie, relative risk ratios of 0.66–0.87).⁴⁹ Although some studies show no protection, others demonstrate some protection for women against infection with human papillomavirus and *C trachomatis* and bacterial vaginosis and decreased rates of infertility and hospitalizations for pelvic inflammatory disease among those who use condoms for contraception compared with those who use no protection.⁴⁹
3. Condom use decreases the rate of acquisition of HIV by those who engage in high-risk sexual activity or whose partners are seropositive for HIV, with relative risk ratios generally in the range of 0.04 to 0.4 (ie, 60%–96% protective).^{49,56–60} In 1 study of serodiscordant partners, consistent condom use decreased the rate of HIV conversion by the negative partner to 1%, compared with 7% in those who did not use condoms.⁵⁶ A recent meta-analysis of condom use in HIV-discordant couples yielded a consistent HIV infection incidence of 0.9

per 100 persons per year in those who always used condoms.⁶¹

In general, the data indicate that condom use is less protective against transmission of STDs and HIV than it is for pregnancy when used correctly and consistently (“theoretical effectiveness”) and in real-life use (“actual effectiveness”). The fact that any single act of intercourse is more likely to result in transmission of disease from an infected partner than in pregnancy may partially account for this difference.⁴⁹ From a public health perspective, condoms, especially if used consistently and correctly, can be expected to decrease the rates of unintended pregnancy and STD and HIV acquisition among those who are sexually active, including adolescents. For the individual, however, condom use, even if consistent and correct, does not ensure prevention of unintended pregnancy or acquisition of an STD or HIV. It is for this reason that abstinence remains the major focus of primary prevention in efforts to decrease adolescent pregnancy, STDs, and HIV infection, whereas condom use is the main focus of secondary prevention for those who are already sexually active and plan to remain so.

USE OF CONDOMS AND OTHER METHODS

Use of spermicides, especially those containing nonoxynol-9, had previously been recommended by some as a means of increasing the efficacy of condom use in prevention of pregnancy and STDs.^{38,47,49} Several considerations were taken into account in making this recommendation. In favor of spermicide use were findings that spermicides kill or inactivate not only sperm but also *N gonorrhoea*, HIV, *Trichomonas vaginalis*, herpes simplex, *T pallidum*, *U urealyticum*, and possibly *C trachomatis*.⁴⁹ Of concern, however, were the following facts: 1) no studies ever definitively demonstrated a beneficial effect of spermicides on STD or HIV transmission with condom use; 2) spermicide use may have adverse effects (although earlier concerns about birth defects and possible urinary tract colonization have not been confirmed)^{62,63}; and 3) spermicides have been shown to cause vaginal irritation in some studies, leading to an increased risk of genital ulcers and a potentially increased risk of HIV infection.^{49,64} This last concern has now been confirmed in a study performed in Africa by the Joint United Nations Program on AIDS, which found in a controlled study of more than 1000 women that those who used a condom and a spermicide with nonoxynol-9 became infected with HIV at about a 50% higher rate than those who used a condom and a placebo gel.⁶⁵ The CDC therefore issued a letter in August 2000 recommending against the use of nonoxynol-9 as a means of preventing STDs and HIV infection.⁶⁶

More recently, use of condoms together with hormonal contraception (the “belt and suspenders” approach) has been advocated as the optimal approach to preventing unintended pregnancy, STDs, and HIV infection in those who are sexually active. Data indicate that some, but not many, adolescents use this approach. In a 1995 study, 8% of adolescent females

in the United States reported using a condom and the birth control pill at last intercourse, and 21% of those using the pill reported that they also used a condom.^{16,67–68} Clearly, this is less than the 37% reporting condom use overall in the same study, indicating that additional efforts are required to remind those who use birth control pills or other methods of hormonal contraception that condom use is also required for STD and HIV prevention.

EFFORTS AIMED AT INCREASING CONDOM USE

Efforts aimed at increasing condom use by adolescents have taken place in clinical, community, and school settings. Several organizations have provided official guidelines for clinicians who have adolescents patients. These include the American Academy of Pediatrics,⁶⁹ American Medical Association,⁷⁰ Maternal and Child Health Bureau of the Health Resources and Services Administration,⁷¹ American Academy of Family Physicians,⁷² and US Department of Health and Human Services.⁷³ Each of these guidelines recommends that counseling about the use of contraceptives, including the condom, be offered to sexually active adolescents as part of preventive health care in clinical settings. There have been multiple studies, however, which have shown that clinicians are inconsistent in following these recommendations.⁷⁴

In community settings, youth development programs incorporate condom use into messages being transmitted to high-risk adolescents, but there have been no specific studies of the efficacy of this approach.¹⁶ Community-based HIV prevention programs have also incorporated condom use into their messages, with some evidence of significant but generally small effects.¹⁶ A direct mailing to adolescent males about condom use also had a small but significant effect.⁷⁵ Condom sales have responded to social marketing internationally, and studies showed increased condom sales in the United States after the release of the US Surgeon General’s Report on AIDS in 1987.⁷⁶ Condom advertising remains taboo on national network television in the United States, however, despite some studies that have shown that most adults would approve of airing ads for contraceptives.⁷⁷

By far the most common, most effective, and best studied efforts aimed at increasing condom use among adolescents, as well as the most controversial, have taken place in school settings. These efforts fall into 2 main categories: education about condom use as part of sex education and HIV prevention programs and direct condom availability programs.

School-based sex education programs during the past few years have generally been of 3 types: 1) abstinence-only programs, which generally do not include information on condoms or other contraceptive methods (except their failure rates); 2) pregnancy prevention programs, which focus on the use of contraception, including the condom, for those who are sexually active; and 3) HIV prevention programs, which focus on condom use as a major component of the incorporation of safer sex strategies.¹⁶

Multiple studies evaluating the effects of these

programs on sexual activity and contraceptive use have been performed during the past few years. These studies have failed to show a delay in the initiation of intercourse, a decrease in frequency of intercourse, or a decrease in the number of sexual partners for abstinence-only programs, when used alone.¹⁶ Studies have shown beneficial effects of some pregnancy and HIV prevention programs, and no studies have shown an increase in intercourse (by hastening onset, increasing frequency, or increasing number of partners) for any of the programs.^{16,78} Increased contraceptive use, including increased use of condoms, has been reported in the evaluation of some pregnancy and HIV prevention programs, with HIV prevention programs having the greatest influence on condom use.^{16,78} It is not yet clear whether this important difference is attributable to the different messages delivered by the programs, the greater impact of HIV infection as opposed to pregnancy for males, better funding or evaluation methods for more recent HIV prevention programs, or other as yet unknown factors.^{16,78}

Despite the controversy that surrounds them, it is becoming clear that sexuality education programs (ie, pregnancy prevention and especially HIV prevention programs) can have some effect on delaying the onset of intercourse, reducing sexual activity, and increasing the use of contraception, including condom use. Unfortunately, the magnitude of these effects is relatively small, in keeping with the known limitations of the effects that education can have on complex social and sexual behaviors.⁷⁸

Because of these limitations, the concept of increasing condom availability through the schools has been implemented with the hope that providing increased access in addition to education can have a beneficial effect. It is estimated that more than 400 high schools in the United States, including many in the largest cities, have instituted condom availability programs during the past decade.⁷⁹ Many of the programs were begun amid great controversy, with many parents strongly in favor and many parents vehemently opposed.⁸⁰ Some programs include parental consent, whereas others do not; some involve school-based health centers, whereas others assign the job of condom distribution to a school nurse or specific faculty members; some include educational components, whereas others make condoms available solely through vending machines, baskets, or drawers.^{79,81}

Several recent studies have evaluated the effectiveness of school-based condom availability programs. One study demonstrated that 93% of respondents in a high school were aware of their school's condom distribution program, 26% of respondents had received condoms, and 67% of respondents who had received condoms used them.⁸² A Seattle study demonstrated that, although students took large numbers of condoms, neither sexual activity nor condom use were reported to have increased.⁸³ A Philadelphia study showed an insignificant increase in condom use, from 52% to 58% at last intercourse.⁸⁴ In a study in Santa Monica, California, 34% of students who had used a condom at last intercourse reported obtaining the condom from the school-based availabil-

ity program, total sexual activity was not increased, and the program was strongly accepted among students.^{85,86} In a study comparing New York City schools that have condom availability programs with Chicago schools that do not have such programs, New York students reported equal rates of sexual activity but higher rates of condom use (with an overall odds ratio of 1.36:1).^{87,88} Similar to results achieved by educational programs, data from condom availability programs demonstrate no increases in sexual activity, with modest increases in condom use after introduction of the programs into school-based settings.

RECOMMENDATIONS

1. Abstaining from intercourse should be encouraged for adolescents, because it is the surest way to prevent STDs, including HIV infection, and pregnancy. Adolescents who have been sexually active previously should also be counseled regarding the benefits of postponing future sexual relationships.
2. Pediatricians are urged to actively support and encourage the correct and consistent use of reliable contraception and condoms by adolescents who are sexually active or contemplating sexual activity. The responsibility of males as well as females in preventing unwanted pregnancies and STDs should be emphasized. Pediatricians need to be actively involved in community programs directed toward this goal.
3. In the interest of public health, restrictions and barriers to condom availability should be removed.
4. Schools should be considered appropriate sites for the availability of condoms, because they contain large adolescent populations and may potentially provide a comprehensive array of related educational and health care resources.
5. To be most effective, condom availability programs should be developed through a collaborative community process and accompanied by comprehensive sequential sexuality education, which is ideally part of a K-12 health education program, with parental involvement, counseling, and positive peer support.
5. Pediatricians can actively help raise awareness among parents and communities that making condoms available to adolescents does not increase the rate of adolescent sexual activity and that condoms, despite their limitations, can decrease rates of unintended pregnancy and acquisition of STDs and HIV infection.
6. Research is encouraged to identify methods to increase correct and consistent condom use by sexually active adolescents and to evaluate effectiveness of strategies to promote condom use, including condom education and availability programs in schools.

COMMITTEE ON ADOLESCENCE, 2000–2001
David W. Kaplan, MD, MPH, Chairperson
Ronald A. Feinstein, MD

Martin M. Fisher, MD
Jonathan D. Klein, MD, MPH
Luis F. Olmedo, MD
Ellen S. Rome, MD, MPH
W. Samuel Yancy, MD

LIAISONS

Paula J. Adams Hillard, MD
American College of Obstetricians and
Gynecologists
Diane Sacks, MD
Canadian Paediatric Society
Glen Pearson, MD
American Academy of Child and
Adolescent Psychiatry

SECTION LIAISON

Barbara L. Frankowski, MD, MPH
Section on School Health

STAFF

Tammy Piazza Hurley

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