

## Norms That Encourage Young Adolescents Not to Have Sex Tied to Reduced Odds of Becoming Sexually Active

Personal and perceived peer norms that encourage adolescents to refrain from sex are associated with reduced odds of sexual initiation among seventh and eighth graders (odds ratios, 0.8 and 0.7, respectively). According to data from a longitudinal survey conducted in three inner-city school districts in New Jersey,<sup>1</sup> alcohol and drug users are more likely than nonusers to start having sex in these grades (1.3–1.5). In addition, the greater adolescents' sense of self-efficacy in avoiding risky behavior and using condoms, the less likely they are to start having sex in seventh grade (0.9), but unexpectedly, the more likely they are to initiate sex in eighth grade (1.2).

Analyses were based on survey data from middle school students who participated in an HIV intervention program in 1994–1996. Participants completed baseline surveys at the beginning of seventh grade and were surveyed again at the end of seventh grade and at the end of eighth grade. Questionnaires asked adolescents about their sexual behavior, demographic characteristics and academic achievement, which was categorized as high (A's and B's), average (B's and C's) or low (C's, D's and F's). The surveys also covered a range of psychosocial factors, including personal and perceived peer norms about refraining from sex and about condom use; communication with parents; self-efficacy in refusing sex, drugs or alcohol and in using condoms; alcohol and drug use in the last 30 days; perceived barriers to condom use; and perceived risk of acquiring HIV or another sexually transmitted disease (STD). Psychosocial survey items were grouped by category, scaled and converted to continuous standard scores. Participants who were sexually experienced at baseline or who provided incomplete or contradictory responses were eliminated from the sample, and adolescents who reported that they had initiated sex during seventh grade were excluded from the analyses of initiation in eighth grade.

Of the 2,973 participants who completed baseline surveys, 48% were male and 52% were female; 84% were aged 12–13. Fifty-one percent of students were black, 30% Hispanic,

9% white, 3% Asian and 6% members of other racial or ethnic groups. At enrollment, 13% of young women and 39% of young men reported that they had already had sex.

By the end of seventh grade, 13% of the 1,637 adolescents who remained in the sample reported that they had become sexually experienced. Although no statistical tests were performed to evaluate the significance of variations, the proportions appeared to be higher among some demographic groups than among others: 19% of men vs. 9% of women; 16% of low academic achievers vs. 10% of high achievers; 16% of blacks and 12% of Hispanics vs. 7% of whites, Asians and other ethnic groups; and 16% of those who spoke only English at home vs. 10% of those who spoke another language. At the end of eighth grade, 15% of the remaining 1,524 participants reported that they had started having sex since the last assessment, and similar differences emerged among demographic groups.

To identify independent predictors of sexual initiation, the researchers constructed three logistic regression models for each time period studied. The first model assessed psychosocial factors, the second considered only demographic characteristics and the third combined those variables that were statistically significant in the first two models.

At the end of seventh grade, the psychosocial model revealed three significant predictors of sexual initiation: Adolescents' odds of having had sex at this stage decreased as their own beliefs, or their perceptions of friends' beliefs, that one should refrain from sexual intercourse increased (odds ratio, 0.7), and as perceived self-efficacy in using condoms and refusing sex increased (0.8). Alcohol and drug users had higher odds of sexual initiation than nonusers (1.2). When only demographic factors were considered, the odds of sexual initiation during seventh grade were significantly higher among men than among women (3.0), and among low and average academic achievers than among high achievers (1.7 and 1.4, respectively); odds were lower among adolescents who spoke another language at home

than among English-only speakers (0.6), and lower among Hispanics (0.9) and whites, Asians and others (0.4) than among blacks.

Scoring high on peer norms remained a highly significant psychosocial factor in the combined model: More preventive norms about refraining from sex were associated with decreased odds of sexual initiation (odds ratio, 0.8). Findings in this model were also consistent for self-efficacy (0.9) and alcohol and drug use (1.3). Gender remained the most significant predictor among the demographic variables; men's odds of having initiated sex were more than twice those of women (2.5). The odds of sexual initiation were lower among adolescents who spoke another language at home than among English-only speakers (0.5) and among whites, Asians and others than among blacks (0.5). In the combined model, Hispanic ethnicity and academic achievement levels were not associated with adolescents' likelihood of having initiated sex during the first phase of the study.

At the end of eighth grade, results of the psychosocial model again revealed a strong association between preventive sex norms and reduced odds of sexual initiation (odds ratio, 0.7). Alcohol and drug use, barriers to condom use and perceived risk of STDs and HIV were linked to elevated odds of sexual initiation during eighth grade (1.2–1.4). Unexpectedly, high levels of self-efficacy were also associated with increased odds of sexual initiation at this stage (1.2). The analysis of demographic variables indicated that predictors for eighth grade were similar to those found for seventh grade: male gender, black race and low or average academic achievement. In addition, sexual initiation was less likely among adolescents whose mothers had graduated from high school or college than among those with less educated mothers (0.9 and 0.8, respectively).

In the combined model, the higher adolescents scored on sex norms, the less likely they were to have become sexually active in eighth grade (odds ratio, 0.7). Participants who reported alcohol or drug use were more likely than nonusers to report that they had initiated

ed sex (1.5); barriers to condom use and high levels of perceived risk were also associated with increased odds of sexual initiation (1.3 and 1.2, respectively). As in the psychosocial model, adolescents' odds of sexual initiation increased with self-efficacy scores (1.2). Most demographic variables remained statistically significant: Sexual initiation was more likely to occur among men than among women (1.5), and among low and average academic achievers than among high achievers (1.7 and 1.5, respectively); the odds were lower among Hispanics (0.4) and among whites, Asians and other ethnic groups (0.4) than among blacks.

The researchers note that young adolescents' level of cognitive development may have limited their ability to understand and answer

certain survey questions. For example, participants' failure to distinguish well between self-efficacy in refusing risky behaviors and in using condoms led to the grouping of these items in a single variable; the mixed findings on self-efficacy should thus be interpreted with caution. The researchers conclude that their findings support "program efforts which address adolescent personal and perceived norms about refraining from sexual intercourse and which address alcohol and drug use among youth."—*R. MacLean*

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## Heavy Use of Tobacco and Caffeine Are Among Factors That May Reduce a Woman's Chance of Conceiving

For couples trying to conceive, certain negative lifestyle factors are associated with an increased time to pregnancy and an elevated risk of not conceiving in the first year.<sup>1</sup> In an observational study of pregnant women and their partners, a couple's risk of not conceiving in the first year of unprotected intercourse was raised when women smoked heavily (relative risk, 3.6), had a heavy intake of coffee or tea (1.7), or were above or below normal weight (2.2–6.9); when male partners had a heavy alcohol intake (2.2); and when the couple had a low standard of living (1.6). The risk increased with each additional factor, and the probability of being pregnant after a year dropped from 93% for couples who had one of the factors to 38% for those with four or more.

Researchers gave questionnaires to consecutive women attending prenatal clinics in two British teaching hospitals to obtain information about their age, time to pregnancy (i.e., from discontinuation of birth control use until conception), gynecologic and pregnancy history, contraceptive use and frequency of intercourse. The questionnaires also asked for information that the researchers used to assess negative lifestyle factors—for women, underweight (body mass index less than 19 kg/m<sup>2</sup>), overweight or obesity (25–39), or severe obesity (greater than 39), and heavy coffee or tea intake (seven or more cups a day); for both partners, heavy smoking (more than 15 cigarettes a day), heavy alcohol consumption (more than 20 drinks a week), any recreational

drug use and low standard of living.

Analyses were based on 1,976 women and their partners. On average, the women were 27 years old and had partners who were 30 years old. The women's mean number of previous pregnancies was 1.5. Couples had intercourse an average of two times per week. Overall, 81% of women became pregnant by the end of the first year; about half of the rest conceived in the second year. Women who did not conceive within one year were significantly older than those who did, had older partners, weighed more and smoked more; their partners smoked and drank more than the partners of women who conceived within one year.

In an analysis adjusted for factors that potentially affect conception, the time to pregnancy differed significantly among women who were nonsmokers, light smokers and heavy smokers (nine, 11 and 19 months, respectively), and among women whose partners were nondrinkers, light drinkers and heavy drinkers (nine, 10 and 17 months). Women with a normal weight became pregnant sooner (within seven months) than women who were underweight (26 months), overweight or obese (11 months), or severely obese (14 months). Couples with a high standard of living conceived sooner than those with a low standard (seven vs. 11 months). Overall, the time to pregnancy increased with total number of negative lifestyle factors, from three months for couples with none to 21 months for couples with five or more.

In a second adjusted analysis, couples' risk of failing to conceive within the first year was elevated when women smoked heavily (relative risk, 3.6) or had a heavy intake of coffee or tea (1.7). Relative to couples in whom the man did not drink, those in whom the man drank heavily had more than two times the risk of not conceiving within the first year (2.2). Couples in whom the woman was underweight had a sharply elevated risk (4.8); risk was also raised when the woman was overweight or obese (2.2) and was markedly increased when she was severely obese (6.9). Couples with a low standard of living had a 60% greater risk of not getting pregnant within a year than couples with a high standard (1.6). Compared with couples who had no negative lifestyle factors, those with two had 3.3 times the risk of not conceiving within the first year, and the differential climbed steadily to 7.2 for those with five or more. The cumulative probability of conceiving within a year decreased steadily from 93% among couples with one negative lifestyle factor to 38% among those with four or more.

The researchers note that because couples who stopped trying to get pregnant were not included in the study, the apparent harmful effects of the lifestyle factors studied may be underestimates. They contend that while couples often disregard the impact of lifestyle factors on fertility, the data suggest that adopting a healthy lifestyle would more than halve the proportion of couples who are unable to conceive within one year. In the long term, such a reduction could lead to a "substantial decline in the referrals for medical investigations and fertility treatments," they conclude.—*S. London*

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## Consistent Use vs. Ever-Use Of Condoms: Which Measure Is More Useful?

Comparing the sexually transmitted disease (STD) prevalence rates of condom users and nonusers may not be as relevant as comparing those of consistent and inconsistent users, according to a study of patients' visits to a Denver STD clinic.<sup>1</sup> Fifty-four percent of clinic visits were by patients who reported having used condoms in the previous four months—38%

sometimes and 16% at every intercourse. Risky sexual behaviors, such as having ever had more than 10 sexual partners or recently having had new or multiple partners, were reported at a significantly greater proportion of visits by condom users than of those by nonusers. In analyses comparing condom users with nonusers, any condom use did not offer clear protection against STDs; however, in analyses comparing consistent and inconsistent condom use, consistent use significantly reduced the odds of gonorrhea and chlamydia among men and women (odds ratios, 0.7–0.9), of trichomonas in women (0.9) and of genital herpes in men (0.7).

The researchers used medical record data of all female and heterosexual male patients who had visited a public STD clinic between January 1, 1990, and December 31, 2001, and reported having had at least one sexual partner in the previous four months. Data included demographic information, lifetime number of sexual partners, number and type of partners in the past four months, STD history, and condom and other contraceptive use within the past four months. The researchers calculated the prevalence rates of three bacterial infections—gonorrhea, chlamydia and trichomonas—and of three viral infections—genital herpes, genital warts and molluscum contagiosum. For viral infections, only first-time cases of genital warts and herpes and cases in which symptoms had been present for 30 days or less were included. Bivariate and logistic regression analyses were used to determine the predictors of any use and consistent use of condoms, and the associations between levels of condom use and STDs.

Within the study period, there were 126,220 clinic visits by 75,397 individual patients; 39% of visits were made by women and 61% were made by heterosexual men. The median ages of women and of men were 24.5 and 27.0 years, respectively. Overall, 37% of clinic visits were by whites, 35% were by blacks, 25% were by Hispanics and 3% were of by members of other races and ethnicities. Chlamydia was the most prevalent STD among women (10% of visits) and men (12% of visits).

Fifty-four percent of clinic visits were by patients who reported having used condoms in the previous four months—38% sometimes and 16% at every intercourse. Men reported condom use at a significantly greater proportion of visits than did women (56% vs. 51%), although this disparity was attributable to a difference in inconsistent, not consistent, use.

Women's use and consistent use of condoms was lower if they had relied on another contraceptive method in the previous four months (43% and 13% of visits, respectively) than if they had not (58% and 19%). In bivariate analyses, condom use was also associated with younger age: Greater proportions of clinic visits by patients younger than 20 than of those by patients 20 or older included reports of condom use (64% vs. 52%) and consistent use (18% vs. 16%). Finally, the prevalence of any use and of inconsistent condom use was greatest among blacks (61% and 44% of visits, respectively), whereas whites had the highest level of consistent use (18% of visits); Hispanics were the least likely to have used condoms, regardless of use level.

Condom use was also related to certain sexual risk behaviors. A significantly greater proportion of visits by condom users than of those by nonusers recorded patients' having ever had more than 10 sexual partners (58% vs. 51%). Furthermore, greater proportions of visits by condom users than of those by nonusers (60–63% vs. 36–41%) and of visits by inconsistent users than of those by consistent users (64% vs. 50–59%) showed patients' having had at least one new partner or multiple partners in the past four months.

In logistic regression analyses of data for men, any condom use was significantly associated with being younger than 20, being non-Hispanic and having had at least one new sexual partner or multiple partners in the past four months (odds ratios, 1.4–2.0); men who had a history of STD had slightly elevated odds of any condom use (1.04). Results for consistent use of condoms were similar, although age was no longer significant and men who had recently had multiple partners were less likely than those who had had a single partner to have always used condoms during intercourse (0.5).

Among women, younger age, being non-Hispanic, having had at least one new sexual partner or multiple partners in the past four months and having had more than 10 lifetime sexual partners were significantly associated with any condom use (odds ratios, 1.1–2.0); women who had used other contraceptive methods in the past four months were less likely than others to have used condoms (0.6). Women 20 or older were more likely than those 19 or younger, and white women were more likely than Hispanics, to have used condoms consistently (1.2 and 1.3, respectively); having recently had multiple partners and used other contraceptive methods were associated

with reduced odds of consistent condom use (0.6 and 0.8, respectively).

In analyses controlling for demographic characteristics, sexual risk factors and STD history, male condom users were more likely than nonusers to have genital warts (odds ratio, 1.2), but less likely to have genital herpes (0.8). However, men who used condoms consistently were less likely than those who used them inconsistently to have gonorrhea, chlamydia or genital herpes (0.7–0.9). Among women, any condom use was associated with an increased likelihood of chlamydia (1.2), but a decreased likelihood of gonorrhea (0.9); female consistent condom users were less likely than inconsistent users to have any of the three bacterial STDs studied (0.7–0.9).

The researchers conclude that comparing the STD prevalence rates of condom users and nonusers may not be a useful comparison, given that greater proportions of condom users than of nonusers reported recent risky sexual behavior. They suggest that “the more relevant comparison is within the condom use group, between those who used them consistently and those who did not,” in which consistent use offered men and women significant protection against bacterial infections, and protected men against genital herpes.—*J. Rosenberg*

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## Teenagers Who Think Sex Is Important May Wait Less Time with New Partners

The length of time that sexually active adolescents—particularly young men—plan to delay intercourse with new partners decreases as the importance they place on sex in romantic relationships increases.<sup>1</sup> According to a study of 14–19-year-olds in San Francisco, the value that young women assign to intimacy, the value they place on health and their perceived risk of contracting a sexually transmitted disease (STD) are positively associated with the amount of time they plan to delay intercourse with their next main partner. Reported delays with most recent main and casual partners were generally shorter than intended delays with new partners.

The findings are based on data from 205 adolescents recruited at a public STD clinic in 1996–1998 who reported that they had ever had sex with both a main and a casual partner. (A main partner was defined as someone the adolescent was “serious about,” and a casual partner was anyone who could not be described as “main.”) Participants completed structured interviews that collected information on their demographic characteristics, perceived risk of STDs, STD status and condom use; the importance they placed on sex and intimacy in romantic relationships; and the importance they attached to various aspects of good health. Participants were also asked how long they had waited to initiate sex with their most recent main and casual partners, and how long they intended to wait with their next partner of each type.

The sample included 125 women and 80 men, whose mean age was 17.7; 37% were black, 22% white, 15% Hispanic, 11% Asian and 15% mixed-race. About half of participants’ mothers had at least some postsecondary education.

The adolescents reported that they had waited longer to have sex with their most recent main partner than with their most recent casual partner (medians, one month and two weeks, respectively). Medians of past delay were shorter than those of intended delay both with main partners (one month vs. two months) and with casual partners (two weeks vs. one month). Significantly higher proportions of men than of women had delayed two weeks or less with their last casual partner (68% vs. 40%), and intended to delay 1–2 months or less with future main partners (65% vs. 46%) and one month or less with future casual partners (74% vs. 36%). The length of time adolescents had waited to have sex with their last main partner did not differ significantly by gender.

Bivariate correlations identified several possible predictors of intended delay with main partners: past delay with both types of partner, importance of health, importance of sex and perceived risk of STDs. Significant correlations were also found between intended delay with casual partners and past delay with both partner types, intended delay with new main partners, importance of health and perceived risk of STDs.

Psychosocial indicators of delay were further examined in logistic regressions, which controlled for demographic characteristics and STD-related attitudes and behaviors. Among male participants, the only psychosocial indicator

that remained significant was the level of importance placed on sex in a relationship: Men’s odds of intending to delay sex with main partners for at least two months decreased as the importance of sex increased (odds ratio, 0.4). Among female participants, the importance of sex was associated with shorter intended delays, with both main partners (0.5) and casual partners (0.4). No other variables were significantly linked to intended delays in casual relationships, but the more value women placed on intimacy in a relationship and on health, the higher their odds of intending to delay for two or more months with their next main partner (3.8 and 2.5, respectively). Perceived risk of STDs also continued to be a significant predictor of women’s intentions to wait two or more months with a new main partner (1.1).

The researchers note that the study may not be generalizable to other adolescent populations and point out that the definition of certain variables may have affected the findings. They conclude that interventions that encourage sexually active adolescents to postpone intercourse with new partners should seek to increase the value that young people place on health and strengthen their awareness of the STD risks associated with having sex with a main partner. Moreover, they say, “directly addressing the value of sex and intimacy in primary sexual relationships and providing education on alternative ways of being sexual and satisfying intimacy needs...will allow adolescents of both sexes to identify healthier choices and encourage longer delays with main partners.”—*R. MacLean*

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## Consistent Condom Use Offers Protection for Those With an Infected Partner

People with a partner who is known to be infected with gonorrhea or chlamydia have a lower risk of having either infection if they use condoms consistently than if they do not, according to an analysis of enrollment data from sexually transmitted disease (STD) clinic attendees participating in a multisite randomized controlled trial.<sup>1</sup> Overall, the odds of infection were reduced by 20% if participants

had used condoms consistently in the previous three months (odds ratio, 0.8). Among participants who had been informed that their partner had gonorrhea or chlamydia, the odds of infection were reduced by 60% if they reported having always used condoms in the previous three months (0.4).

The investigation aimed at addressing a common drawback of previous studies evaluating the protection offered by condoms against transmission of curable STDs—namely, they did not control for whether a participant’s partner was infected. According to the researchers, people with partners who are infected, or who are perceived to be infected, may have an increased likelihood of condom use; hence, condom effectiveness may have been underestimated in studies that included people who had not been exposed to STDs. To assess the importance of accounting for a partner’s infection status when investigating the effectiveness of condoms against chlamydia and gonorrhea, the researchers analyzed enrollment data from Project RESPECT—a trial of HIV counseling interventions conducted at five publicly funded STD clinics in four states (Maryland, New Jersey, Colorado and California) between 1993 and 1997. Participants were heterosexual, HIV-negative, aged 14 or older and English-speaking, and had been sexually active in the past three months. A total of 4,783 participants were tested for chlamydia and gonorrhea at study entry, and completed a questionnaire about their sexual behavior and condom use during vaginal and anal intercourse in the past three months.

Nine percent of participants (206 males and 223 females) had been referred to the clinic because they had received written or verbal notification from their partner or health department that the partner had chlamydia or gonorrhea. Of these, 48% tested positive for one or both infections. By comparison, of the participants who did not know their partner’s infection status (2,470 males and 1,844 females), 25% tested positive for one or both infections.

In multivariate logistic regression analyses of data from both groups of participants that controlled for the total number of episodes of sex in the previous three months, consistent condom use was associated with significantly decreased odds of having chlamydia or gonorrhea (odds ratio, 0.8). Also, participants who had had a main partner were less likely than those who had not to have contracted one of these STDs (0.7). Odds of infection were doubled for males, blacks, participants aged 25 or

younger, those with a high school education or less, and those who had been informed of their partner's infection status (1.7–2.2). Furthermore, participants who reported having had a new partner in the past three months were more likely than those who did not to be infected (1.3).

Analyses limited to participants with an infected partner showed that the odds of being infected with chlamydia or gonorrhea were lower among those who had always used condoms than among those who had not (odds ratio, 0.4), and higher among those who had had unprotected sex more than 10 times in the previous three months than among those who had not had unprotected sex (3.8). Although an analysis restricted to those who did not know their partner's infection status suggested that consistent condom use was related to a reduced likelihood of infection (0.8), this finding was not statistically significant. Finally, for participants who had had a new part-

ner in the past three months and for those who perceived their partner to have a high risk of infection, consistent condom use was linked to having significantly reduced odds of being infected (0.7 for each).

The researchers comment that because of the likely overrepresentation of people who had experienced condom “failures” among the participants known to have an infected partner, the study provided “only a minimum estimate of condom effectiveness.” Still, the analysts suggest that “consistent condom use likely provides greater protection against transmission of [gonorrhea and chlamydia] than previously reported, a finding that holds important implications for public health recommendations and practice.”—*T. Lane*

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## Teenagers Who Abstain from Sex Cite Similar Reasons Regardless of Whether They Have Ever Had Intercourse

High school students who have never had sex or who decide to abstain after becoming sexually experienced often say their choice is rooted in a fear of negative consequences, such as pregnancy and sexually transmitted diseases (STDs), and personal beliefs about the appropriateness of teenage sex, according to a large, cross-sectional survey of Minnesota adolescents.<sup>1</sup> Females, regardless of grade and whether they had ever had intercourse, were more likely than males to say a fear of pregnancy and STDs played a part in their decision to be abstinent, and to say they just did not want to have sex. Males who had not yet had sex were more likely than females to say that one reason for their decision was they believed that most students did not have sex. Adolescents selected similar reasons for choosing abstinence whether or not they had ever had sex.

To determine the factors that play a role in teenagers' decisions to abstain from intercourse, the researchers analyzed data from a 1998 Minnesota survey that included ninth- and 12th-grade students. Students were asked if they had ever had sexual intercourse, or “gone all the way,” and whether they were still having intercourse. Those who were abstinent were given a list and asked to indicate all reasons for their decision. The list provided 11

reasons: fear of parental disapproval, pregnancy, STDs and getting caught; the perception that most students do not have sex, most of a youth's friends do not have sex and sex is not right for a person the respondent's age; a lack of desire to have sex; a decision to wait until marriage; and a perceived advantage to waiting, taught by parents or learned at school.

Of the 73,464 students in the sample, nearly nine out of 10 were white. Sixty-four percent of males and 68% of females had never had sex; 3% of males and 2% of females were sexually experienced but currently abstinent (i.e., practiced secondary abstinence); and 33% of males and 30% of females were sexually active.

Males who practiced secondary abstinence were significantly more likely than sexually active males to have caused a pregnancy (21% vs. 9%), to be raising a child (25% vs. 11%) or to be raising their own child (10% vs. 4%). Females practicing secondary abstinence were no more likely than sexually active females to have ever been pregnant (11% vs. 12%), to be raising a child (20% vs. 16%) or to be raising their own child (6% vs. 4%).

The most common reasons for abstinence selected by females who had never had sex were a fear of pregnancy (82% of ninth-grade, 77% of 12th-grade students) or of STDs (75%

and 61%, respectively). The third most common reason selected by ninth graders was the belief that sex was not right for a person their age (70%), and by 12th graders was a decision to wait until marriage (58%). Among males who had never had sex, only about one in five in each grade cited concern about pregnancy as a reason for their abstinence. Concern about STDs was the most common reason selected by ninth graders (57%) and the second most common reason selected by 12th graders (46%). The most common reason selected by 12th-grade males who had never had sex was a decision to wait until marriage (47%). Half of sexually inexperienced ninth-grade males and one-third of 12th-grade males felt that intercourse was inappropriate for a person their age. The only reason on the list that was selected more often by sexually inexperienced males than females was the belief that most students did not have sex. Fifteen percent of ninth-grade males and 9% of their female peers selected this reason, as did 5% and 2%, respectively, of 12th graders.

Like females who had never had sex, sexually experienced females who abstained most commonly cited a fear of pregnancy (two-thirds of both ninth and 12th graders) and a fear of STDs (about half of both groups). One-third or more of such females were concerned about parental disapproval (40% of ninth-grade, 32% of 12th-grade students) and said they did not want to have sex (33% and 42%, respectively). By contrast, no more than 38% of sexually experienced males in either grade selected any single reason. The most common reasons they cited were fear of STDs (34% of ninth graders and 38% of 12th graders) and parental disapproval (36% and 33%, respectively). Sexually experienced males in 12th grade who were abstinent were more likely than females to say that school had taught them the advantage of waiting; roughly one in five selected this as a reason, compared with about one in 10 females. Males in that grade were also more likely than females to say that most students in their school did not have sex (14% vs. 2%) and that most of their friends did not have sex (15% vs. 8%).

The researchers conducted logistic regression analyses to examine the associations between gender, grade and reasons that students did not have sex. In one set of analyses, they compared the abstinence reasons between sexually inexperienced females and males, and between 12th graders and ninth graders; in a second set, the same comparisons were ex-

amined among sexually experienced students.

The researchers found that sexually inexperienced females were significantly less likely than males to say they believed that most students did not have sex (odds ratio, 0.6) and significantly more likely than males to give every other reason. The differential was dramatic for fear of pregnancy (25.7) and more moderate for the remaining reasons (1.2–4.9). Only three abstinence reasons were selected more often by sexually inexperienced 12th graders than by ninth graders: fear of pregnancy, wanting to wait until marriage and not wanting to have sex (1.1–1.4). All other reasons were less likely to be selected by 12th graders than by their ninth-grade counterparts (0.3–0.9).

Among sexually experienced students who were currently abstinent, females were significantly more likely than males to cite fear of pregnancy (odds ratio, 6.9). They were also more likely than males to lack a desire to have sex, to be afraid of STDs, to be afraid of getting caught, to believe sex was not right for a person their age and to say their parents had

taught them the advantage of waiting (1.5–2.1). Ninth-grade students were similar to 12th-grade students in the reasons they selected for secondary abstinence. However, 12th-grade students were less likely than ninth graders to be afraid of getting caught (0.7) and more likely to say that they had a fear of pregnancy and they did not want to have sex (1.5 for each).

The results may not be generalizable to adolescents in other regions of the country or to those who are not students, according to the researchers. However, the findings suggest that adolescents choose to abstain from sex for a variety of reasons, and that sexually inexperienced and sexually experienced adolescents cite similar reasons for choosing abstinence, they said. Intervention strategies “could become more effective if they incorporated these reasons as part of their educational methodology,” the authors conclude.—*T. Tamkins*

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## For Labor Progressing Too Slowly, Immersion in Water May Be Effective Alternative to Obstetric Intervention

For women who are having their first birth and whose labor is progressing more slowly than expected, immersion in water may reduce the need for standard methods of augmentation, according to results of a study conducted in a British hospital.<sup>1</sup> A group of women who labored in water were significantly less likely to require obstetric intervention than were a comparable group whose labor was managed with standard augmentation; those in the immersion group also reported less pain and greater satisfaction with some aspects of the approach.

The study, conducted in 1999–2000, included 99 nulliparous women with a diagnosis of dystocia (i.e., cervical dilation during active, spontaneous labor was occurring at a rate of less than 1 cm per hour). All participants were at low risk of complications and had received information about the study during pregnancy. They were randomly assigned to receive standard care for dystocia (amniotomy and intravenous oxytocin as needed) or to labor in an acrylic pool filled with tap water. Care for both groups of women was managed by midwives, who administered analgesia and monitored the progress of labor. If labor was not progressing

satisfactorily, the midwives administered additional oxytocin to women in the augmentation group and advised women in the immersion group to consider augmentation.

Half of women in each group were married, and the women’s average age was about 25–26 years. The two groups were similar with respect to mean gestational age at the start of labor and mean cervical dilation both at the beginning of labor and when dystocia was diagnosed. On average, the birth weights of their infants also were about the same.

Forty-seven percent of women who labored in water and 66% of those receiving standard augmentation required epidural analgesia at some point; the difference, assessed through chi-square testing, was not statistically significant. Likewise, the rate of operative delivery did not differ between groups (49–50%). However, the proportion who had labor augmented by amniotomy, oxytocin or both was significantly lower in the immersion group than in the augmentation group—71% vs. 96%. (For two women assigned to the augmentation group, labor progressed before augmentation began.) And the proportion who had any of

these interventions was significantly lower among women who labored in water (80%) than among those who received standard augmentation (98%).

In postpartum interviews, women who had labored in water rated their pain 30 minutes after the start of the intervention significantly lower level than those in the augmentation group did. Furthermore, women in the immersion group reported a reduction in pain over the following half hour, while those in the augmentation group said that their pain had increased. Overall, about nine in 10 women in each group were satisfied with the labor management approach, but higher proportions in the immersion group than in the augmentation group were satisfied with the freedom of movement (91% vs. 63%) and privacy (96% vs. 81%) it afforded.

Finally, indicators of maternal and infant well-being showed little difference by approach to management of labor. Rates of both maternal and infant infections were similar in the two groups, as were infants’ Apgar scores and blood gas levels. Twelve percent of infants born to mothers in the immersion group, but none of the others, were admitted to the neonatal unit within 10 days; most were released within 48 hours and had no subsequent problems.

The researchers conclude that standard augmentation is not “inevitable” for nulliparous women with dystocia, and that laboring in water under the care of a midwife may reduce the need for obstetric intervention and offer an effective alternative for managing pain. Given these outcomes, they add, the immersion approach may have benefits for women’s physiological and psychological health.—*D. Hollander*

#### REFERENCE

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## Three-Year Program Helps Male Adolescents Establish, Maintain Sexual Limits

In a largely Hispanic middle school population in California, male youth receiving a three-year, 20-lesson, theory-based curriculum on pregnancy and sexually transmitted disease (STD) prevention had delayed sexual initiation compared with their peers receiving regular sex education;<sup>1</sup> however, the program did

not delay sexual initiation for females. Even a full year after the program ended, males who had received the intervention were significantly less likely than their peers to report having any sexual activity in the previous 12 months; this is explained, in part, by program participants' successful avoidance of situations that could lead to sex.

The intervention, called Draw the Line/Respect the Line, aims primarily to decrease the proportion of students having sex and to increase condom use among sexually active youth. Program participants and controls in this randomized trial came from three ethnically and socioeconomically diverse urban school districts in northern California. Students at 10 middle schools were randomly assigned to receive the intervention as their main source of school-based pregnancy and STD prevention education throughout grades 6–8; students at nine other schools, the control group, received their school's usual education on these topics. The intervention group received 20 lessons presented in English or Spanish by experienced health educators during classroom periods; instruction techniques were interactive and included small group discussions and skills practicing.

Sixth-grade intervention recipients and controls—2,829 students in all—completed a baseline survey in the spring of 1997; they also completed annual follow-up surveys at the end of grades 7–9. Surveys asked about demographic characteristics, sexual behaviors and psychosocial measures that used scaled scores to assess students' knowledge of HIV and condoms, attitudes toward potential reasons for having or not having sex, normative beliefs, self-efficacy to refuse sex, sexual limits and situations that could lead to sex.

Nearly equal numbers of males and females completed the baseline survey; the mean age at baseline was 11.5. More than half the students were Hispanic (59%); 17% were white, 16% were Asian, 5% were black and 3% were of other races or ethnicities. Four percent of students reported having had intercourse at baseline.

Males in the intervention group differed statistically from those in the control group at each follow-up in the proportions reporting two key sexual behavior variables: The adjusted proportions reporting any sexual experience were 10% among intervention recipients and 14% among controls in seventh grade, 15% vs. 22% in eighth grade, and 19% vs. 27% in ninth grade. Sex in the past year was reported by 7% of intervention recipients and 11% of controls in seventh grade, 11% and 19% in eighth, and 17% and 25% in ninth. The groups also differed significantly (and increasingly) over time in the proportions reporting any sexual experience.

On these same two variables, no statistically significant differences were found between females receiving the intervention and female controls. The adjusted proportions reporting ever having had sex were 6% for both groups in seventh grade, 11–12% in eighth grade and 20–22% in ninth. Sex in the past year was reported by 4–5% in seventh grade, 9% of both groups in eighth and 18–20% in ninth.

No group differences were found for either males or females in the proportions reporting recent condom use. However, statistical power for this analysis was limited.

In regression analyses, improvements over time were significantly greater among males in the intervention group than among male controls in the adjusted mean scores reflect-

ing HIV and condom knowledge, attitudes favoring reasons for not having sex, sexual limits and situations that could lead to sexual behavior. For each gender, the intervention group demonstrated greater improvements over time in peer normative beliefs favoring sex; in addition, the intervention and control groups differed at each follow-up for HIV and condom knowledge.

The investigators also used regression models to examine whether psychosocial variables measured in the eighth grade mediated the effects of the intervention on males' report in the ninth grade of having had sex in the previous 12 months. According to the investigators, being in situations that can lead to sex was "the most important behavioral mediator": Males receiving the intervention had 30% lower odds of being in such situations than males in the control group; meanwhile, those who reported being in such situations had increased odds of reporting sex in the past year (odds ratio, 1.6). Other mediators were ability to set sexual limits, peer norms supporting sexual activity and belief that it is all right for females to pressure males to have intercourse.

Commenting on the program's success among males, the authors note that "this intervention may have created a new norm within the school environment—one that made boys more comfortable with the idea of refraining from sex." In addition, they assert that the intervention "provided boys with a crucial skill—recognizing and avoiding situations that might lead to sexual intercourse."—C. Coren

#### REFERENCE

1. Coyle KK et al., Draw the Line/Respect the Line: a randomized trial of a middle school intervention to reduce sexual risk behaviors, *American Journal of Public Health*, 2004, 94(5):843–851.