

Prevention of Unintended Pregnancy Among Sexually Active Adolescents in the United States



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ABSTRACT

BACKGROUND: Adolescent pregnancy and birth rates in the United States have declined dramatically from their peaks in 1991, but remain much higher than those seen in most other developed countries.

METHODS: Recent results from relevant clinical trials, periodic surveys of reproductive age women, and focus group work as well as professional group recommendations in the United States are presented to provide insights into the problem of unintended teen pregnancy and suggest potential solutions.

RESULTS: Dramatic changes in contraceptive technologies and practices have been implemented in the past several years to reduce the barriers young women have in accessing the most effective methods of contraception. However, new reports about how young women view their risks suggest that new strategies will be needed to motivate more sexually active young women to prevent pregnancy.

CONCLUSIONS: The safety and efficacy of modern methods of contraceptives are the highest they have ever been, but if unintended pregnancy rates among teens in the United States are to be more significantly reduced, young women's attitudes about contraception and pregnancy prevention need to be better understood and remaining barriers to its access need to be reduced.

KEYWORDS: adolescent unintended pregnancy rates, contraceptive implants, intrauterine devices, disparity in teen pregnancy

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Scope of the Problem

In the United States, the rates of adolescent pregnancy, abortion, and birth remain almost seven times higher than the rates seen in many other developed countries, despite significant improvements that have been made in recent years.^{1–5} From a peak in 1991, the birth rates of US adolescents aged 15–19 years had declined by 59% by 2013; declines in teen pregnancy rates have also been impressive.^{6,7} However, the percentage of teen pregnancies that are unintended is the highest of any age group; 91% of pregnancies in women aged 15–17 years are unintended as are 77% of pregnancies in women aged 18–19 years.⁸ Similarly, 77% of teen *births* (aged 15–19 years) are unintended.⁹ However, that does not mean that the other pregnancies were planned or desired; it only means that those pregnancies were not *opposed* by the young women at the time they conceived. Pregnancies to which the young women are ambivalent, indifferent, or internally conflicted are categorized as intended pregnancies; so, the *intended pregnancy* category contains many pregnancies that do not achieve the goal of *planned and prepared for* pregnancies.^{10–12}

Increasingly, adolescent pregnancy rates in the United States are highest among those least able to provide for

them—indigent and minority women.^{8,13,14} Overall, rates of nonuse of contraception are highest among adolescents, women over 35 years, unmarried women even if cohabitating, women who are foreign born, and US-born black woman. Experiencing poverty as an adolescent increases the risk of becoming an adolescent parent, more so than childhood exposure, in part because it shapes the young woman's sexual network structure.¹⁵ Even after adjusting for age and ethnicity/race, or high socioeconomic groups, use of contraception is significantly different in schools and neighborhoods comprising lower resource groups.¹⁶ For example, young women in the higher income ranges and those whose mothers were more educated have increased their use of intrauterine devices (IUDs) and implants at higher rates than young women in lower income groups.¹⁷ For US-born adolescents, family disintegration tied to poverty is tightly linked to risk for teen pregnancy; for immigrant teens, limited resources for educational and career development and socioeconomic and social barriers increase that risk.¹⁸

The costs of teen births are mostly funded by the public sector; in 2010 alone, these costs totaled over \$9.4 billion.¹⁹ In addition to the direct dollar costs associated with pregnancy



care for adolescent women, the financial, physical, psychological, and social impacts on teen mothers and their children are substantial. Against this backdrop, adolescent contraception is very cost effective.^{20,21}

Caring for teens requires knowing if they are sexually active and what measures they are taking to protect themselves from sexually transmitted infections (STIs) and pregnancy. One retrospective study reported that of the 1,000 visits to primary care clinicians, only 212 documented that a sexual history had been taken.²² Primary care clinicians are more frequently being called up to counsel women about contraception, but in their very busy practices, they often confront different and more difficult challenges dealing with these issues than do traditional family planning service providers.^{23,24}

This article discusses the recent developments in adolescent use of more effective methods of contraception and insights into why unintended pregnancies continue to be such a problem in this age group in order to highlight clinical practices that might make sexually active teens more successful contraceptors.

Recent Trends in Adolescent Sexuality

The declines in unintended pregnancy and birth rates among teen women have been attributed to both decreases in the percent of unmarried adolescent and young women who have been sexually active and to greater utilization of contraception by sexually active teens.²⁵ The National Surveys of Family Growth (NSFG) that have been periodically conducted since 1990 provide more information about trends in many aspects of adolescent sexual behaviors.

Adolescent sexual activity. In the latest NSFG survey from 2011 to 2015, 44% of never-married adolescent women and 47% of never-married adolescent men reported that they had experienced sexual intercourse at least once. This rate has not changed substantially for women since the 2006–2010 cycle. By the age of 19, over two-thirds of teens (68%–69%) had ever had sexual intercourse.^{25–27} However, a delay in sexual debut of young adolescent women has been reported. In the 2006–2008 study cycle, 11% of never-married women aged 15–19 years had sex before the age of 15 years, compared with 19% in 1995.²⁸

Adolescent use of contraception. The use of contraception has remained fairly constant between the two NSFG survey cycles; 84% of teen men and 79% of teen women reported using contraception at sexual debut. Rates were higher among older teens. Of those waiting until age 18–19 years to initiate sexual activity, 93% of women and 99% of men reported having used contraception with sexual debut, but only 77% and 82% of women and men who initiated sexual activity at younger ages reported using contraception with their first act.²⁵ Nonuse of contraception at first coitus at any age is a risk factor for teen pregnancy and teen birth, but the relative risk is particularly high for younger teens. By the age of 17, those who did not use contraception at first intercourse were

five times more likely than those who did to have experienced a teen birth.²⁷ However, contraception is not consistently used over time. As one indication of inconsistent use, 18% of sexually active teen women reported that they used no contraceptive method at their last intercourse.²⁸

Types of contraception used by adolescents. There have been some shifts in the *types* of contraception that teenage women report ever having used, but the methods that have historically been the most common are still utilized the most. Condoms have been used for protection at least once by 97% of women; withdrawal is the second most frequently reported method (60%); and oral contraceptives have been tried by 54%. There has been a significant increase in the reported use of emergency contraception, rising from 8% in 2002 to 22% by the 2011–2013 cycle. However, use of the most effective methods (implants and IUDs) remains very low (<5% contraceptors). Depot medroxyprogesterone acetate (DMPA) use declined from 21% to 15%, whereas fertility awareness use rose from 11% to 15%.^{25,29} These trends persist despite the fact that nearly all teen and young women sampled in the 2011–2013 NSFG reported having had formal sex education and 68% reported having received female contraceptive education.³⁰ Comprehensive sex education was associated with a significantly lower likelihood of teen pregnancy compared with teens who received no sex education or abstinence-only education.³¹

Quiet Revolution in Contraception Service Guidelines

Over the past several years, there have been many significant developments in the practice of contraception, which have profoundly impacted availability of methods for sexually active couples, especially adolescent and young women. At the core, these recommendations reinforce the concept that contraceptive counseling and provision are for health promotion not disease prevention.

US Medical Eligibility Criteria for Contraceptive Use (US MEC). The first of these—the US Medical Eligibility Criteria for Contraceptive Use—was developed by the Centers for Disease Prevention and Control (CDC) to provide evidence-based guidance about the medical appropriateness of contraceptives for women with a variety of conditions.³² In other words, it answered the question: *Who* can get contraceptives? Their recommendations were modeled after those of the World Health Organization (WHO), but addressed more specifically the medical problems commonly found among US women. The US MEC are summarized in a downloadable summary form that is easy to access during patient visits.³³ Very importantly, these guidelines indicate that neither age nor nulliparity is a contraindication to the use of *any* method of birth control, including the most effective methods—UDs or implants.

US Selected Practice Recommendations for Contraceptive Use, 2013. This document compliments the US MEC and answers to the second question—*how* should



contraceptives be provided?³⁴ Overall, these recommendations uncoupled well-woman visit requirements from services needed to provide women with each of the different methods of contraception. Again this was modeled after a similar document developed by WHO, and it reflected earlier work done in the United States to reduce some of the barriers women (especially younger women) faced in gaining access to contraception.³⁵ It reversed decades of practice in which women could be denied contraception until they completed their routine well-woman care. These recommendations provide a method-specific, short list of examinations and tests that are needed if a woman's history does not reveal any problems or potential contraindications to establish her method eligibility. They also strongly recommend that every method be initiated on the day of the woman's visit regardless of her cycle day, once pregnancy is reasonably ruled out. Since the challenges of maintaining ongoing access to daily, weekly, or monthly methods have been shown to increase unwanted pregnancy and abortion rates,³⁶ these recommendations also encourage dispensing at least one year's supply all at once. Finally, they eliminate unnecessary requirements for follow-up visits or tests, but do provide advice about how to manage side effects or complications that might arise with method use.³⁷

Providing Quality Family Planning Services: Recommendations of CDC and US Office of Population Affairs.

Among other features, these recommendations are designed to help women develop reproductive life plans.³⁷ They state that every year, the clinician caring for a young woman should ask her how many children she wants in her lifetime, when she wants her next pregnancy, and if she thinks her current method will help her achieve these goals.³⁸ This action is intended to help women learn how important (and feasible) pregnancy planning is and to help clinicians identify women who need to learn about preconception care and those who may benefit from longer acting contraceptive methods. Reproductive life planning has most recently been endorsed by the American College of Obstetricians and Gynecologists.³⁹ However, the series of national screening questions (and the follow-up questions) may be too time consuming for primary care settings, so a *single question initiative* has been introduced; primary care clinicians are urged to ask each reproductive age woman at least annually: "Would you like to become pregnant in the next 12 months?"²³ While this question is simpler, it does not acknowledge the fact that over half of the pregnancies are unintended and among adolescent women, over three quarters of pregnancies are unintended. A more useful, open-ended question might be, "How do you think you would *feel* if you became pregnant in the next year?"⁴⁰

Important Lessons Learned from Recently Published Studies

Several recent large-scale studies have provided important evidence about how adolescent women rate the acceptability, safety, effectiveness, and tolerability of contraceptive methods.

The CHOICE study. The CHOICE study was a longitudinal observational study in St. Louis, Missouri, involving 9,256 women, including 1,404 women aged 14–19 years. Tier 1 (IUD and implants) and Tier 2 (DMPA, oral contraceptives, transdermal contraceptives, and contraceptive vaginal ring) methods were provided without cost to women interested in participating in this study for up to three years. Women were counseled about different methods in the order of efficacy (see Table 1 for first-year failure rates in typical use). Nearly three quarters of teens (72%) chose an IUD or implant.⁴¹ None of the teens who chose either the copper IUD or the implant experienced any pregnancies, and only two teens who used the levonorgestrel-releasing IUD (LNG-Intrauterine System [IUS]) became pregnant while using the method, this is in stark contrast among those who chose pills, patches, or rings to the pregnancy rates that exceeded 5%.⁴² Nulliparous women under age 20 years had first-year continuation rates of 83% for the implant, 81% for the LNG-IUS, and 79% for the copper IUD. Parous teens had slightly higher continuation rates at each point in time.^{42,43} By contrast, teens using pills as well as transdermal or vaginal contraceptives had a 55% discontinuation rate by one year.⁴⁴ This study demonstrated that universal complete coverage of contraception could increase teen use of implants and IUDs and result in fewer unintended pregnancies, improved health outcomes, and considerable cost savings for the health-care system.⁴⁵

Colorado initiative. In Colorado, a statewide family planning initiative was launched in 2009, which provided teens and young adults with free access to contraception, especially IUDs and implants.⁴⁶ By 2011, the pregnancy rates among study participants were 29% lower among low-income Colorado women aged 15–19 years and 14% lower among 20–24 year olds than expected fertility rates. Declines in abortion rates for these two groups were reported to be 34% and 18%, respectively.⁴⁷

Table 1. First year failure rates in typical use by method (%).*

METHOD	FAILURE RATES IN TYPICAL USE (%)
Condom	
Female	21
Male	18
Diaphragm	12
COC, POP, patch, ring	9
Depo-Provera injection	6
Intrauterine contraceptives	
ParaGard (copper T)	0.8
Mirena (LNG)	0.2
Implant	0.05
Female sterilization	0.5
Male sterilization	0.5

Notes: *Modified from Trussell J, et al. *Contraceptive Technology*, 20th edition. New York, NY: Ardent.



Clinical trials of various LNG-IUSs. In the Phase III clinical trials of the low-dose levonorgestrel IUD (LNG-IUS-8) with 13.5 mg levonorgestrel, 39.5% of subjects were nulliparous and 38.8% were between ages 18 and 25 years. At the end of the three-year clinical trial, the important clinical outcomes of efficacy, expulsion, infection, bleeding patterns, and discontinuation rates were found to be very similar for nulliparous and parous women.⁴⁸ Nulliparous women had lower rates of IUD expulsion (2.6% vs. 4.9%) but younger women had slightly higher rates of at least partial expulsion (4.8% vs. 3.6%) than older women. Rates of pelvic inflammatory disease were lower among the nulliparous women (0.1%). Efficacy was not affected by age or parity. Severe pain at the time of placement was reported by 15.5% of nulliparous women. More recently, in Phase III clinical trials for a new version of the 52 mg LNG-IUS, ~60% of subjects were nulliparous; 98.7% of placements were successful.⁴⁹ The 3-year cumulative pregnancy rate for women aged 16–35 years was 0.55, the expulsion rates for nulliparous women was 2.0%, and pelvic inflammatory disease was diagnosed in two women during 34,711 28-day cycles of use.⁵⁰

Professional Organization's Position Statements

The American Congress of Obstetricians and Gynecologists (ACOG) Committee on Adolescence concluded in 2009 that practitioners should “encourage implants and IUDs for all appropriate candidates, including nulliparous women and adolescents” and that they should “adopt same day insertion protocols.”⁵¹ This position was reinforced in 2015 when ACOG urged fellows to advocate for changes to ensure timely access of these methods for women of all ages.⁵⁰

The American Academy of Pediatrics (AAP) has also concluded that given their efficacy, safety, and ease of use, long-acting reversible contraceptives (LARCs (AKA IUDs and implants)) fixed should be considered first-line contraceptive choices for adolescents who decide to be sexually active.¹

Challenges in Caring for Adolescents

Adolescent and young women frequently present additional age-specific challenges.⁵² For adolescent women, consent issues can prevent clinicians from counseling or providing effective contraception. At this time, only 26 states and the District of Columbia explicitly allow all those 17 years and younger or minors of at least a specific minimum age to consent on their own for contraception. Twenty states limit access to only certain categories of teens, such as those who are married.⁵³

Furthermore, because of billing requirements, confidentiality may not be possible even for young women up to the age of 26 years, if they are still covered by parental insurance policies.⁵⁴ Parental knowledge and acceptance of contraceptive methods may influence the choices made by their children. In a random sample of 261 parents/guardians with a daughter aged 12–17 years who completed a telephone survey, 59% of

parents accepted oral contraceptives, but only 18% accepted IUDs. Almost half (49%) did *not* think it would be acceptable for clinicians to provide their sexually active teens with condoms.⁵⁵

Sexually abused teen women are at least twice as likely to experience a teen birth compared with those who deny abuse even after controlling for other known risk factors.⁵⁶ Reproductive coercion, which is fairly common among teen women, increases the risk of unintended pregnancy.⁵⁷ In one study of 356 teens seeking contraception, 19% reported having been previously coerced into not using a condom and another 12% said they were afraid to ask their partner(s) to use condoms.⁵⁸ Mosher et al reported that 14.4% of women under the age of 20 years said they had unprotected sex because their male partner did not want birth control to be used.⁵⁹ Among Latina teens followed longitudinally, pregnancy was 3.3 times more likely if they had low power in a sexual relationship with a main partner than those without a main partner.⁶⁰ Similar findings were reported by teen women whose partners were in gangs⁶¹ and those exposed to violence in any form.⁶²

Adolescent women may lack communication skills that are needed to negotiate method use (especially condom use) with their partners.⁶³ Other challenges arise from the young woman's lack of understanding about her reproductive risk and her sporadic activity, serial monogamy, and often hesitancy to discuss these risks with her parents and/or their lack of knowledge about these topics.

Insights into Young Women's Attitudes About Contraception from Analyses and Focus Groups

Analysis of the 2002 and 2006–2010 National Survey of Family Growth revealed for women under the age of 20 years who had experienced an unintended pregnancy as a result of unprotected intercourse, the more frequent reason they gave for nonuse of contraception was, “I did not think I could get pregnant” (41%) followed in frequency by “I did not expect to have sex” (33%).⁶² Ambivalence toward pregnancy and internal conflicts about pregnancy are also commonly found among teens as well as older women who do not use contraception.^{10,11}

For many women of any age, planning for pregnancy is not even a recognized concept; pregnancy is seen as a natural process that *just happens* to a woman.¹¹ For some, the situation is even more bleak; planning for pregnancy is considered taboo unless the woman is in a favorable financial and social situation, which many low income and minority women may never achieve.¹¹ However, if a pregnancy does occur to a woman in suboptimal conditions, it will often be favorably accepted. Knowing this, young women may not be completely committed to consistent use of any method of birth control.

Even when teens formulate pregnancy intentions, those plans fluctuate rapidly. Rocca et al reported considerable changes in pregnancy intentions among a group of predominantly Hispanic teens where 18% of intendedness changed in six months. Paradoxically, most pregnancies occurred in



women with the lowest intention; 73% of pregnancies occurred among adolescent teens who reported that they definitely did not want to become pregnant.⁶⁴

The National Campaign for Prevention of Teen and Unplanned Pregnancy has recently presented recommendations from their adolescent focus group survey work, which has provided very relevant insights into the counseling approaches needed when dealing with adolescent women.⁶⁵ The following are the points and important recommendations derived from that work:

- Most teen women are not aware of the wide range of contraceptive options available to them. This reinforces the need to present the most effective methods *first* in the counseling.
- Women believe that all methods are effective. Stressing the superior effectiveness of implants and IUDs over oral contraceptives or even condoms may not impress teens.
- Side effects (or *perceived* side effects) are more important to young women than is effectiveness.
- Clinicians need to watch their words. The term “LARC” may be meaningful to fellow clinicians, but it is not to teens. The concept of “long term” is not welcome by many young girls. They are more attracted by “low maintenance” methods or those that “are made to fit the new generation.”
- Teens are not clear about the differences between IUDs and implants and are beginning to bundle them together under the negative term “invasive methods,” so counseling should be done separately for each of these two different methods.

Other important pearls emerged from this survey. Women want to learn from those who are experienced about what they (and their partners) can expect while using the method. Also, they responded to the idea that contraceptive choice is dynamic. A woman’s choice today should reflect what is important to her today, but she may legitimately make different choices in the future. The teens interviewed did not respond favorably when birth control was compared with pregnancy because they did not see that they were choosing one over the other; contraception was seen as something that is used *until* pregnancy.

Approaches to Reduce Rapid Repeat Pregnancies Among Adolescent Women

Unfortunately, often the first interaction family planning providers may have with adolescents is following a pregnancy—either postpartum or postabortion. Compared with older women, young women have the fastest return to ovulation. For social and financial reasons, they have low rates of breastfeeding and often do not return for postpregnancy care. All of these factors result in the high rates of rapid repeat pregnancy seen in teens aged 15–19 years.^{66,67} Short interpregnancy

intervals are associated with a number of adverse pregnancy outcomes, such as intrauterine growth restriction and preeclampsia.⁶⁸ Contraceptive counseling should be administered throughout pregnancy rather than delaying the discussion until the postpartum visit.⁶⁹

The safety and tolerability of immediate postpartum placement of IUDs (within 10 minutes of delivery of the placenta) and postabortal placement of these devices have been demonstrated by numerous studies.^{68,70–74} Higher expulsion rates following postpartum placement have been observed following vaginal delivery,⁴⁷ but may be lower, at least short term, when IUDs are placed through the uterine incision at the time of elective cesarean delivery.^{75,76} Utilization rates of IUDs at 6 and 12 months postpartum may be higher in those who have these methods placed immediately after delivery than those who have planned placement at their routine postpartum visit; and pregnancy rates are also lower among those who receive them promptly postpartum.^{47,77} Similarly, the safety, efficacy, and acceptability of implant placement during the delivery hospitalization and high continuation rates have been well documented,^{47,75,77–81} even in women who plan to breastfeed their infants.^{82,83} Recognizing these benefits, Medicaid programs in over a dozen states now provide full coverage for provision of both implants and IUDs as inpatient procedures.

In other situations, DMPA or progestin-only oral contraceptives can be offered as a bridge prior to discharge from hospital.⁸⁴ Initiation of estrogen-containing methods should be delayed until 21 days following second trimester loss or full-term pregnancy for low-risk women, but for those who have risk factors, such as preeclampsia, smoking, excessive blood loss, obesity, and cesarean delivery, estrogen methods should not be initiated for at least six weeks postpartum.³³ Newer studies show that combined oral contraceptives may be initiated in low-risk, breast-feeding women as early as four weeks postpartum without compromising lactation.⁸² However, availability of contraceptive methods immediately following pregnancy may not be sufficient; intensive counseling may be needed to enhance their uptake.⁸⁵

General Recommendations for Method Success

Same Day/Quick Start protocols (in which the woman initiates contraceptive use at any time in her cycle when the clinician is confident that she is not pregnant) have been shown to increase the uptake of a variety of methods.^{86–88} In addition to providing the chosen method of contraception, it is important to provide emergency contraception for preceding acts of unprotected intercourse and barrier methods to use for at least seven days following method initiation. However, financial issues (such as uncertainty about insurance coverage) can pose challenges to the Quick-Start model for implants and IUDs in many settings.⁸⁹

Counseling about potential bleeding changes that may occur with the use of any of the methods is important prior to selection of a method⁹⁰ and at every follow-up visit. Such directed



counseling has been shown to significantly increase continuation rates compared with routine practices.⁹¹ Teens worry that unscheduled bleeding with progestin-only methods may indicate that the method is not working; amenorrhea raises concern that the method has made them infertile.⁹² Unscheduled bleeding can also impact the sexual life and religious activities of women in many faiths. On the other hand, adolescents with special needs may especially benefit from complete amenorrhea.⁹³

Lacking a primary care provider and relying on visits to emergency departments (EDs) are risk factors for teen pregnancy. In one study, nearly one-third of teens seen in a pediatric (ED) were pregnant or could be expected to become pregnant within a year. Half of those teens believed that the (ED) doctor should discuss pregnancy prevention, and one quarter was interested in starting contraception in the ED.⁹⁴

Studies show that provision of implants and IUDs does not decrease utilization of condoms or put women at increased risk for STIs.⁹⁵ However, use of male or female condoms should be urged for all those who are at risk of STIs, regardless of the contraceptive method they use.

Method-specific Suggestions for Contraceptive Success with Teens

Implants. In the CHOICE project, greater percentages of teen women selected implants than did women in other age groups.⁴³ Pregnancy protection afforded by the implants is not affected by patient weight.⁹⁶

Counseling about potential bleeding patterns is important for both short- and long-term continuation rates with the implant. Providing women a prescription for high-dose therapy with nonsteroidal anti-inflammatory drugs (NSAIDs) at the time of placement (to be used in case they experience prolonged or heavy bleeding) may increase continuation rates. Use of vaginal contraceptive rings or low dose combination oral contraceptives can relieve these bleeding complaints at least temporarily and may provide time for the woman to develop more favorable bleeding patterns.⁹⁷

During counseling, careful attention to wording can be very important with this method. As noted above, Suellentrop et al warned that teens were labeling IUDs and implants as *invasive*, so using words like *insertion* might reinforce that characterization. Using less-invasive words like implant or IUD *placement* might avoid this problem. Similarly, women said that they wanted to know what they would feel with method use. Reassuring the woman, for example, that she should not even be aware that her implant is there, but “when she touches her skin over the implant, she will be able to feel it is still in place” may also reduce the concerns she may harbor about having chronic pressure pain at the site of the implant. Women with dysmenorrhea have improvement of their symptoms with the implant, which may be very appealing to adolescents who suffer from that problem.⁹⁸

LNG-IUSs. The smaller, lower dose LNG-IUS-8 has been recommended for nulliparous and young women because

of its smaller size, lower hormonal levels, and lower rates of amenorrhea with the lower dose IUS; only 4.7% of women in the clinical trials discontinued due to bleeding abnormalities.⁵¹ However, the larger LNG-IUS-20 introduced in the United States in 2002 has a strong record of success with many adolescent women.^{50,99} In the CHOICE study, 58% of teens chose the LNG-IUS and continued to use this LNG-IUS-20 for at least three years.⁴³ Smaller uterine size found in nulligravida and nulliparous women has been associated with less cramping and bleeding with the LNG-IUS-20.^{100,101} The counseling messages about IUD placement and management of heavy or prolonged bleeding listed above for the implant are also helpful for the LNG-IUS. No treatment (other than counseling) is recommended for women who develop amenorrhea. Women who suffer dysmenorrhea have higher rates of IUD expulsion,¹⁰² but the vast majority of those who retain their IUDs benefit from decreased menstrual cramping.^{103–105}

Copper IUDs. Copper IUDs are also an excellent option for adolescent women, except those who have heavy, prolonged, or painful menses. Often teens are attracted by the convenience of this IUD and by the fact that it contains no hormones. On the other hand, its 10-year duration may be off-putting to teens for whom a decade is over half of their lifetimes. It is important to remind them that they can have the IUD removed whenever they want to become pregnant. Women can be reassured that increases in blood loss caused by the copper IUD can usually be reversed by periodic use of high-dose NSAIDs.^{106,107}

Injections. DMPA was one of the two contraceptive methods in the 1990s that dramatically reduced teen pregnancy rates in the United States, despite its first-year failure rate in typical use of 6% (Table 1). It offers many non-contraceptive benefits that help teens with special problems, such as reduction in the numbers and intensity of sickle cell crises¹⁰⁸ or menstrual suppression for those with difficulty coping due to developmental delays.¹⁰⁹ Concerns about bone loss with prolonged use significantly curtailed US use after the turn of the century.¹¹⁰ Today clinicians often limit its use to two years, despite the fact that studies have shown return to normal bone density within two to three years after DMPA cessation of the method and that fracture rates are not increased by DMPA use.^{111–113} ACOG has advised that concerns about bone health should *not* influence the decision to initiate or to continue DMPA use.¹¹⁴ The conclusions of studies about potential excessive weight gain with DMPA have been inconsistent,¹¹⁵ but one study found that the minority of women who exhibited weight gain with early use were at risk for continued excessive weight gain with later use and may not be good candidates for continued use of DMPA.¹¹⁶ Among high-risk women, DMPA use may increase the risk of HIV acquisition in areas of high HIV prevalence.¹¹⁷

Elimination of routine pregnancy testing prior to any injection and adoption of two- to four-week grace periods and Quick-Start protocols for DMPA may reduce barriers



to its access.^{91,118} Since in some insurance plans, DMPA is not classified as a medical benefit but is a pharmacy benefit, some women may be better served if pharmacists provide reinjections of DMPA.^{119,120} Another approach might be self-injection; over one-third of adolescent and adult women were found to be interested in and capable of administering the subcutaneous version of DMPA with brief education.¹²¹

Pills, patches, and rings. The CHOICE study found that women who used these methods had 21 times higher pregnancy rates than those women who chose to use implants or IUDs.¹²² However, many women enjoy the noncontraceptive benefits of combined hormonal methods—such as predictability of scheduled (and usually lighter) bleeding and rapid return to fertility under their control. Some chose to use extended cycle pills or vaginal rings to further minimize scheduled bleeding.¹²³ Some women are not familiar with their anatomy and may place the ring too low in their vaginas and suffer pressure pain or easy expulsion. Using old-fashioned cardboard tampon introducers to place the contraceptive ring can help direct the ring past the cervix and into the upper vaginal vault where neither the woman nor her partner is likely to feel it.

Barrier and behavior methods. Male condoms may have higher failure rates in typical use than Tier 1 or Tier 2 methods because of inconsistent or incorrect use, but they provide the most effective protection from STIs. As such, their use should be encouraged in all new relationships, even though the woman may be using a more effective contraception method. For young teens, standard size male condoms may slip off, so condoms that have *snugger fit* may be more effective.¹²⁴ Placement and consistent utilization of male condoms by men of all ages can be challenging.¹²⁵ The woman can use the female condom if her partner is unwilling or unable to use a male version. Spermicides have high failure rates in typical use, but they are available over-the-counter in case a woman has no other immediate options. The vaginal contraceptive film is particularly portable in even the smallest of purses. The contraceptive sponge minimizes postcoital messiness.

Behavior methods, such as coitus interruptus, are always available to young couples and are often used by them. *Abstinence tonight* or *abstinence today* should be encouraged if the couple does not have immediate access to methods to reduce the risk of pregnancy and STD transmission. Other sexual pleasuring actions can be used in these settings—including masturbation (solo or mutual), outercourse, or oral-genital sex; however, the latter two still carry some element of risk for STD transmission.

Emergency contraception. The levonorgestrel emergency contraceptive (LNG-EC) products may not have impacted unintended pregnancy rates at a population level as much as was hoped by its early advocates, but they are an important option for individual at-risk women.¹²⁶ Providing prescriptions for that product in advance of need increases the chance it will be used sooner (when it is more effective)

and often shifts the out-of-pocket costs to insurance companies. The newer ulipristal acetate emergency contraceptive pill maintains high efficacy for five days following intercourse.¹²⁷ It is also much more effective than the LNG-EC products in women with a body mass index >25 kg/m².¹²⁸ One concern raised by UPA-EC is the potential interaction between progestogens in hormonal contraceptives and the antiprogesterin activity of UPA-EC. In order to avoid diminishing the effectiveness of UPA, initiation/resumption of hormonal contraception should be delayed for five days after the last act of unprotected intercourse. Abstinence or backup methods are needed for 7 days following ingestion of LNG-EC or 14 days following UPA-EC. The copper IUD is the most effective method of preventing pregnancy after unprotected intercourse, but, in this context, it may function as an interceptive (blocking implantation), which may not be acceptable to all women.^{129,130} However, once the copper IUD is in place, it provides ongoing contraception (preventing fertilization) for many years.¹³¹

Technological aids to motivate teens. Newer tools utilizing social media-delivered health interventions have shown promise for increasing use of condoms at last intercourse among subjects at high risk for sexually transmitted diseases and may have the potential to increase contraceptive method use for pregnancy protection too.^{132–134} Cell phones and social media may be used to improve sexual communications between partners, which may be more awkward in person.⁶⁶ Referral to teen-friendly websites with accurate information, such as Bedsider.com, can help young women prepare better for their visits. The use of an iOS waiting room *app* that provided contraceptive counseling increased interest in contraceptive implants.¹³⁵ Other studies have found that young women are interested in having visual aids to accompany counseling. Daily text-message reminders plus health information increased oral contraception continuation rates and reduced prolonged pill interruption.¹³⁶ However, complete reliance on technology will probably not be effective. Computer-assisted motivational intervention, when combined with an enhanced home visit program significantly reduced rapid repeat pregnancies among adolescent mothers, but the computer-assisted motivational intervention only approach did not.¹³⁷

Conclusions

Comprehensive contraceptive counseling, especially for teens, should include abstinence as an effective way to prevent sexually transmitted infections (STIs) and pregnancy. For adolescent women who have decided to be sexually active, implants and IUDs should be treated as default (first-line) options. The CHOICE study demonstrates that other methods should also be offered in order of efficacy in typical use, guided by the woman's need for noncontraceptive benefits. Same Day method initiation increases uptake and may prolong utilization, especially of implants and IUDs. Expanding availability



of contraception to nontraditional sites may enhance uptake. Better understanding of adolescent thought processes may help shape messages that can better motivate younger women to delay sexual activity until they are prepared to protect themselves from pregnancy and STIs and to use contraception correctly and consistently when they become sexually active until they are prepared for pregnancy and parenthood.

Author Contributions

Wrote the first draft of the manuscript: ALN and RK. Contributed to the writing of the manuscript: ALN and RK. Agree with manuscript results and conclusions: ALN and RK. Jointly developed the structure and arguments for the paper: ALN and RK. Made critical revisions and approved final version: ALN and RK. Both authors reviewed and approved of the final manuscript.

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