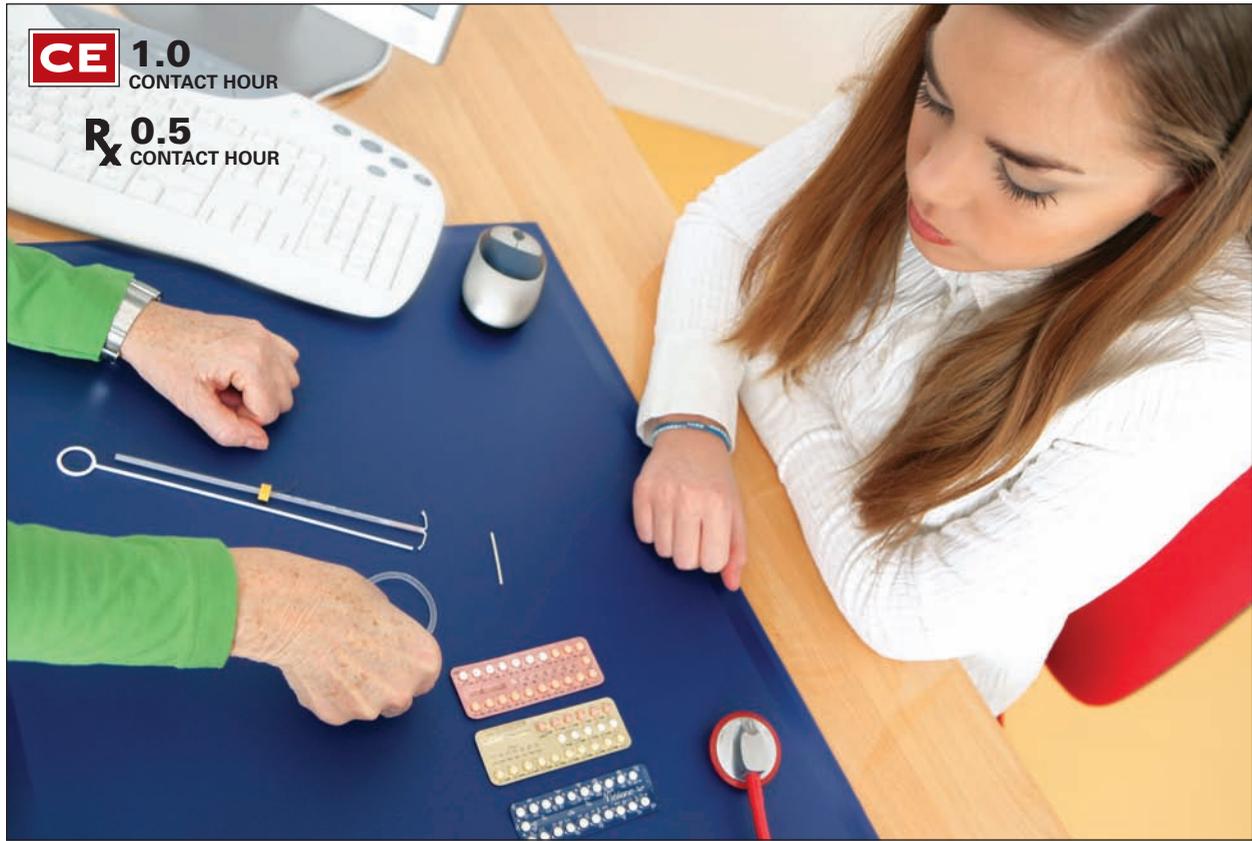


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Long-acting reversible contraceptives: Addressing adolescents' barriers to use

Abstract: NPs caring for adolescent females have an opportunity to reduce US teen pregnancy rates through unbiased counseling on contraception options, including highly effective long-acting reversible methods. Intrauterine devices and subdermal implants are safe, effective contraception options for adolescents, but their rates of use remain low among this patient population. This article discusses current adolescent contraceptive practices, barriers to access, and current recommendations for long-acting reversible contraceptive use.

By Jennifer H. Turner, WHNP-BC, EFM-C

Adolescent pregnancy rates in the US have declined over the last 2 decades, reaching a historic low across all 50 states as of 2018; however, unintended adolescent pregnancies remain high.^{1,2} The pregnancy rate among Hispanic and Black adolescents remains twice as high compared with non-Hispanic White adolescents.³ Data indicate that the overall observed decline in adolescent pregnancy

is linked to a delayed sexual debut, increased abstinence, and increased contraception use.⁴⁻⁶

Long-acting reversible contraceptives (LARCs), including intrauterine devices (IUDs) and subdermal implants, are recommended for nearly all sexually active females, including adolescents.⁷ LARC methods are a first-line recommendation for adolescents, including nulliparous adolescents, by the American

Keywords: adolescent, contraception, etonogestrel, intrauterine device (IUD), levonorgestrel, long-acting reversible contraceptive (LARC), pregnancy, subdermal implant

College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP).^{8,9} LARCs are effective for 3 to 10 years, depending on the device used, and require no maintenance after they are inserted.^{2,8} Currently, only 4.5% of females ages 15 to 19 years choose LARCs compared with short-acting contraception options.⁹

Trends suggest that three-fourths of adolescent pregnancies are unplanned and nearly half are mistimed.¹⁰ Addressing barriers to LARC use in adolescents can help reduce unintended pregnancy among US adolescents. Barriers include lack of counseling, safety concerns, adverse reactions, and cost.

■ Background

Sexual debut for US adolescents is typically between ages 16 and 18, with the proportion under age 15 declining. That number is comparable with similar industrialized nations worldwide; however, adolescent pregnancy is 6 to 12 times higher in the US than it is in other industrialized countries.^{11,12} Each year in the US, 22.3 per 1,000 adolescents ages 15 to 19 become pregnant; this is a decline of more than one-third since the peak adolescent pregnancy rate in the early 1990s.¹³



Currently, only 4.5% of females ages 15 to 19 choose LARCs compared with short-acting contraception options.

According to the Guttmacher Institute, adolescents who are sexually active without any form of contraception are at a 90% risk for pregnancy within 1 year.¹⁴

Despite declining rates, US teenage pregnancy remains a major public concern.¹⁵ Nationally, more than 75% of adolescent pregnancies (ages 15 to 19) are considered unintended, whether mistimed or unintended.¹⁶ Adolescent pregnancy is linked to critical social and economic issues for young mothers, including higher reliance on welfare, lower academic achievement, and inferior health compared with other adult women.⁴ The annual public cost associated with adolescent pregnancy in the US is \$9.4 billion, which includes healthcare, child and foster care, lost tax revenue, and incarceration among adolescent mothers.^{4,17}

Due to the substantial costs, both social and financial, the CDC has prioritized the topic. Winnable

Battles is a public health campaign created to focus on public health priorities that can be addressed within a relatively brief period. In the most recent report from the campaign, adolescent pregnancy declined by 46% from 2009 until 2015, which exceeded the target decline of 20%. Because adolescent pregnancy has potential short-term and long-term consequences for adolescents, the topic remains a priority in all 50 states.⁶ Although the number of adolescents using birth control at sexual debut has not significantly changed since the 1990s, the rates of more effective contraceptive methods have moderately improved.¹⁸

■ Short-acting contraceptive effectiveness

The most commonly used methods of contraception among adolescents include the male condom, the withdrawal method, and the oral contraceptive pill (OCP). The selected methods are associated with higher knowledge about these methods and their acceptance among adolescents.¹⁹ Contraception effectiveness is based on how well the method is used. *Perfect use* indicates the method is used correctly and consistently every time, while *typical use* relates to the average correct and consistent use of the method. All three of these

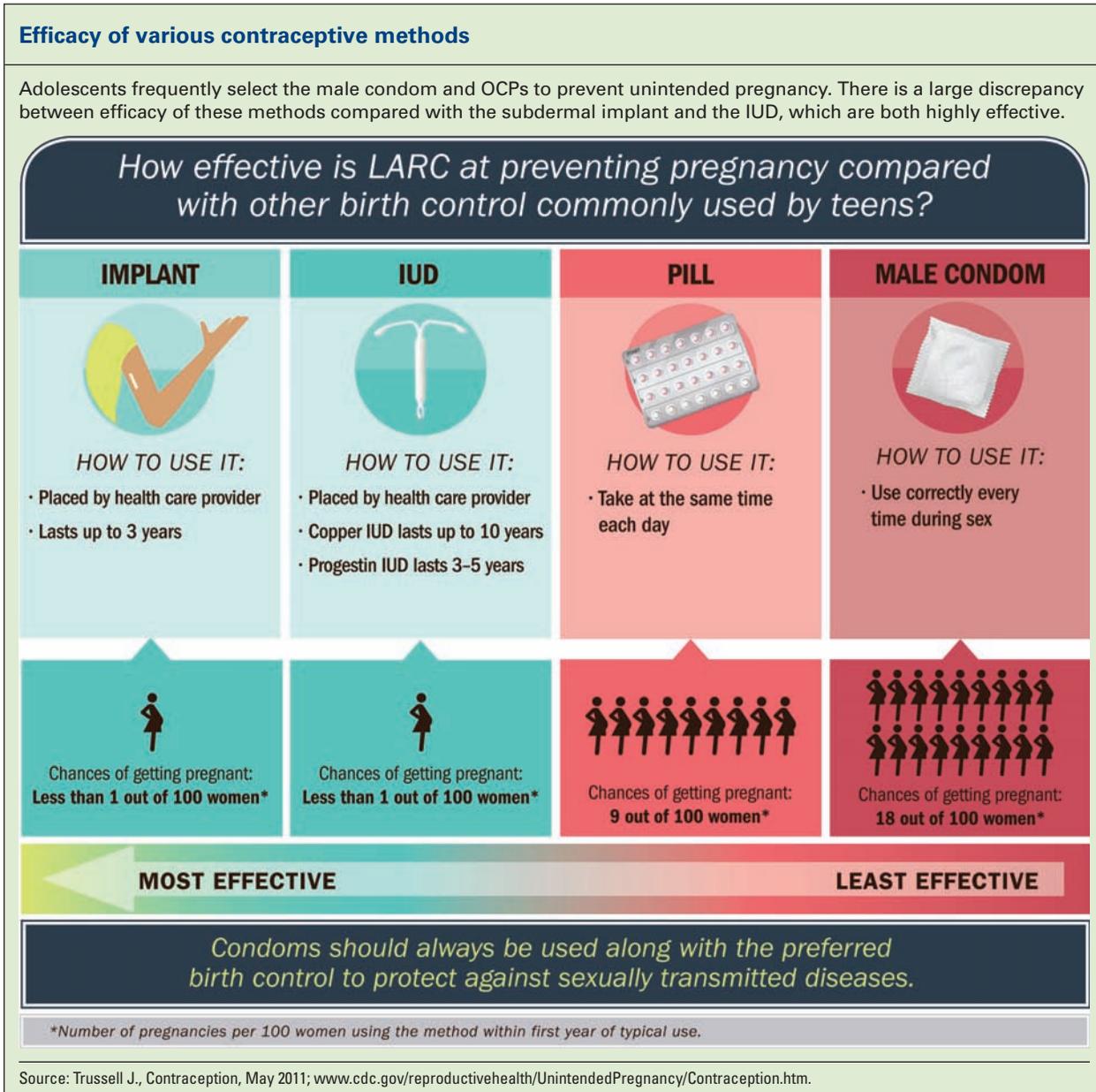
methods have high typical use failure rates.¹ The male condom is the most frequently selected method by adolescent females; the current use is 68%. Based on typical condom use among adolescents, failure is 18%.²⁰

The second-most common method,

withdrawal before ejaculation, is used by 59.7% of this population, with a failure rate of 22%. OCP use is the most commonly prescribed method, accounting for 55% of sexually active female adolescents who are prescribed contraceptive options. The 1-year typical failure rate is 9%.⁵ Reasons for discontinuation of the OCP among adolescents include difficulty with a daily regimen and unanticipated adverse reactions.¹⁵ (See *Efficacy of various contraceptive methods.*)

■ LARC methods

Two categories of LARCs are currently available in the US: nonhormonal and hormonal. The copper IUD is the only nonhormonal LARC available and is approved for 10 years of use. It is designed for women who must avoid exogenous hormones because of comorbidities or those who choose to avoid hormones. A benefit of the copper IUD is that it can be used for emergency



contraception if inserted within 5 days of unprotected intercourse.¹ The hormonal IUD contains levonorgestrel, a synthetic progestin, and was approved for use in the US in 2000.²¹ Multiple levonorgestrel options are currently available in the market, with variations in IUD size, hormonal content, and duration of use ranging from 3 to 5 years.²²

The contraceptive efficacy by both the nonhormonal and hormonal IUD is pregnancy prevention by inhibiting sperm motility, thus preventing fertilization. The levonorgestrel IUD has an additional benefit of thickening cervical mucus and thinning the

endometrial lining, creating a hostile environment that prevents sperm from reaching a mature egg. Because the endometrial lining is thin, a patient using a levonorgestrel IUD may experience amenorrhea or light menstrual cycles.⁸ Fertility returns soon after IUD removal, and IUD use has no long-term effects on fertility or future conception.²¹

The subdermal implant is also a LARC option available to adolescents.²¹ The implant is a 4-cm radiopaque rod containing etonogestrel, a synthetic progestin hormone, approved for 3 years of use. The rod is placed in the patient's upper arm by a trained

provider during a minor in-office procedure. This method inhibits ovulation, thins the endometrial lining, and thickens cervical mucus. The etonogestrel implant has additional benefits, including dysmenorrhea reduction.^{7,8} Etonogestrel levels diminish to undetectable levels within days of removal and fertility returns thereafter.²¹

Adolescents who use LARC methods demonstrate significantly higher continuation rates compared with adolescents using common short-acting contraceptive methods. Among adolescent users, the continuation of LARC methods is 81% at 12 months, higher than any of the short-acting contraceptive methods.¹⁵ Specifically the continuation rate at 1 year of the copper IUD is 75.6%, the levonorgestrel IUD, 80.6%, and the etonogestrel implant, 82.2%, respectively.¹⁵ The continuation rate at 12 months of common short-acting methods is currently 44%.¹⁵ Satisfaction rates among LARC users is more than 80% compared with OCP rates at 54%.²¹

■ LARC effectiveness and safety

Contraceptive failure can occur with all available methods; however, the failure rate of LARC methods is less than 1%, which is comparable to the failure rate of permanent sterilization.²³

LARC methods are considered safe as evidenced by 40 years of clinical trials and medical studies. The rate of unplanned pregnancy among short-acting contraceptive method users is 22 times greater than LARC users.²¹ Compared with adult users, adolescents have



Adolescents are more likely to consider reliable contraceptive methods if recommended by a healthcare provider after appropriate counseling.

similar experiences with LARCs. Insertion risks are the same for adolescents as they are for adults. Some patients experience apprehension in choosing an IUD as their preferred form of contraception based on a suggested association with infertility and ectopic pregnancy; however, these beliefs are unsubstantiated by current data.⁸

Both infertility and ectopic pregnancy concerns can easily be addressed with appropriate contraceptive counseling. An IUD alone does not increase a user's risk for infertility; however, a history of an untreated

lower genital tract infection such as gonorrhea or chlamydia is more closely associated. Infertility is also not considered a long-term risk after discontinuing a LARC method compared with other reversible contraceptive options. Any adolescent participating in high-risk sexual practices, such as more than one sexual partner, nonuse of condoms, or recurrent sexually transmitted infections (STIs), should be excluded as a candidate for IUD use.²²

■ Barriers to LARC use among adolescents

LARC methods are safe, effective, and recommended for adolescents, but use among US adolescents remains low. Complications associated with using LARC methods are low and, like their older adult counterparts, adolescents who select these methods have a high rate of continuation of use.⁸ Barriers include a lack of education during contraceptive counseling, concern for safety, adverse reactions, and cost. Addressing each of these key barriers will provide recommendations for clinical practice.

Lack of adolescent counseling. Generally speaking, adolescents who are counseled on contraceptive options are not adequately counseled on the comprehensive options available including LARC methods, which limits the individual's ability to make an informed decision.⁸ Fifty to sixty percent of surveyed adolescents reported lack of awareness of LARC options, and among those who were aware of such options, only 25% understood adolescent eligibility for use of these methods. Common reasons LARCs

are not introduced during counseling include provider bias regarding methods, safety concerns for use in this population, and the high upfront cost.²¹ Despite these barriers, adolescents are more likely to consider reliable contraceptive methods

if recommended by a healthcare provider after appropriate counseling.²⁴

Safety concerns and myths. Pregnancy risk is very low with IUD use; however, the risk of ectopic pregnancy is increased if a woman becomes pregnant with an IUD in place.²¹ Unintended pregnancy is 0.001% with the nonhormonal IUD, 0.14% with the hormonal IUD, and 0.7% with the implant, based on data collected over 3.75 years by The National Survey of Family Growth.²⁵ Although the subdermal implant reduces the risk of pregnancy, there remains a relative risk of

ectopic pregnancy as well.²⁶ Higher ectopic pregnancy incidence is associated with prior fallopian tube damage, a history of an ascending pelvic infection, including pelvic inflammatory disease (PID), and prior pelvic or fallopian tube surgery.²⁷

A common myth is that LARCs are abortifacient, but this is incorrect; LARCs only prevent pregnancy.²⁸ The levonorgestrel IUD mechanism of action inhibits ovulation and disables sperm, preventing fertilization in the event that ovulation does occur.^{8,29} The nonhormonal IUD also works by interfering with sperm's transport, thus preventing egg fertilization.²⁹ A copper IUD can be inserted within 5 days of unprotected coitus, preventing implantation of a fertilized egg into the uterus; this is consequently misinterpreted by some as being abortifacient.^{8,29} Based on current medical standards, the emergency use of the copper IUD is not considered abortive.²⁸ An etonogestrel implant is not associated with abortion in any clinical trials or literature.³⁰

The risk of developing PID is considered relatively low, even among adolescents who are using an IUD. In fact, the heightened risk of PID is only during the first 20 days after IUD placement.³⁰ For a patient with a positive chlamydia or gonorrhea screen after the insertion of an IUD, the risk of PID is not statistically significant if the infection is managed promptly.²² ACOG does not support routine screening of STIs preceding IUD insertion in average- to low-risk individuals; however, for high-risk individuals, including adolescents, screening is recommended before the insertion of an IUD.²²

Providers and patients alike have demonstrated concern for IUD expulsion and uterine perforation among nulliparous adolescent patients. Neither the type of IUD nor parity has a statistically significant impact on expulsion rates by users.³¹ The expulsion rate with an IUD is low for all women regardless of age, on average 2% to 10% during the first year. Uterine perforation is far less common than IUD expulsion, accounting for 0.3 to 2.6 cases per 1,000 insertions and usually associated with experience of the provider inserting the IUD.³² Rates of perforation are low among all IUD users, including adolescents. Higher incidence may occur in users with low parity, high number of prior therapeutic abortions, breastfeeding women, and during the first 6 months

after childbirth. Age and history of uterine surgery, including cesarean sections, are not associated with uterine perforation.³²

Adverse reactions. All contraceptives have adverse reactions, including both IUDs and the etonogestrel implant. The NP should counsel patients that minor pain may be experienced with the insertion of an IUD or placement of the etonogestrel implant. Supportive measures such as the use of a

The price of obtaining a LARC can range from \$500 to \$1,000, not including the provider's insertion fee or cost of follow-up visits.



paracervical block or nonsteroidal anti-inflammatory medication can reduce pain experienced during IUD insertion. Misoprostol can be used during IUD insertions in patients with a previous failed insertion but is not routinely recommended or supported by ACOG. The use of misoprostol may help reduce the number of difficult insertions or failed IUD insertion attempts but has not been shown to reduce pain associated with insertion.³³ A local anesthetic is suggested during the insertion of the etonogestrel implant.²²

Alterations to the menstrual cycle and light intermenstrual bleeding are commonly associated with LARC use. The bleeding profile of the copper IUD includes regular menstrual cycles with a marginally increased menstrual volume. The levonorgestrel IUD incites less menstrual bleeding though it may take several months to establish a consistent pattern. A systematic review of literature found menstrual bleeding lessened in all IUD studies. Anticipatory guidance should be provided to individuals concerned with this adverse reaction.³⁰

The most common bleeding patterns among etonogestrel users include amenorrhea (33.3%), prolonged bleeding (16.9%), and frequent bleeding (6.1%).⁸ The bleeding profile during the first 3 months is predictive of future bleeding. Problematic bleeding can be managed through anticipatory guidance or medical therapy.²² With any LARC, heavy, persistent bleeding occurring for a duration of longer than 3 months should be evaluated for other causes such as a lower genital tract infection or gynecologic malignancy.³⁰

Concerns with the etonogestrel implant include complications associated with the insertion procedure and significant weight gain. Less than 1% of users experienced a local site infection, hematoma, or minor skin irritation during implant insertion. Weight gain associated with the etonogestrel implant is a common myth for candidates. Evidence disputes a clinically significant weight gain; a study of 130 uses represented a mean weight gain of 2.1 kg (4.6 lb) over 1 year.²² Eleven international clinical trials found 12% of users reported weight gain but only 2.3% of users discontinued the implant as a result.³⁰ The CDC recommends monitoring patient's weight with a baseline measurement and again at each follow-up visit.³⁴ Counseling patients that weight changes may or may not occur is important prior to initiating the method.³⁵

Cost. The price of obtaining a LARC can range from \$500 to \$1,000, not including the provider's insertion fee or cost of follow-up visits.³⁶ The upfront

and Title X programs without parental input or approval.³⁷ Regulations vary at the state level regarding parental involvement when contraceptive services are used through private insurance programs.³⁸

■ Counseling best practices

Contraceptive counseling. Contraceptive counseling should be accurate, up-to-date, and evidence-based. In a 2017 study among 390 APRNs working in Title X clinics, 84% provided IUDs and 77% offered the etonogestrel implant to all appropriate candidates.¹⁰ Discussing the available contraceptive methods during counseling, considering LARC methods for eligible candidates including nulliparous adolescents, and advocating for coverage with appropriate payment will improve adolescent use.¹⁵ Confidentiality is a crucial component of contraceptive counseling; ACOG suggests establishing procedures and routine safeguards for patient privacy in accordance with federal and state statutes.⁸ If confidentiality cannot be

ensured, adolescents can be referred to Title X clinics that offer contraceptive services but do not rely on private insurer payment.¹⁵

To facilitate patient choice, a shared decision-making strategy is suggested. Providers managing



When cost barriers are removed, an adolescent female will select more effective and long-acting contraceptive methods.

cost may initially be prohibitive for patients. However, over a period of 3 to 10 years, the cost becomes comparable to what would have been spent on other reversible methods.^{7,8} A unique concern for adolescents is receiving contraceptive services without parental knowledge or consent, as many adolescents remain on a parent's insurance policy; federal law allows adolescents to seek contraceptive services through Medicaid

LARC use should enhance the patient's experience by encouraging the adolescent to be part of the decision-making process. Reviewing options using an efficacy-based approach, starting with the most effective and progressing to the least effective, is also recommended.¹⁵ The dialogue should include a review of all FDA-approved options appropriate for the patient, patient satisfaction and failure rates, and common adverse reactions. NPs should counsel adolescents about menstrual cycle changes, clarify the patient's expectations regarding her menstrual cycle, and address myths and misconceptions associated with each method.³⁰ Educating adolescents using a hands-on approach by touching and seeing each option may enhance the education. Providers should consider using web-based tools, including social media tools, to engage adolescents in a contraceptive and safer sex practice discussion.²¹ (See *Safer sex practice counseling*.)

Financial counseling. The removal of cost barriers is the leading catalyst in improving the likelihood of adolescent LARC use. In fact, when cost barriers are

Safer sex practice counseling^{8,19,22,34}

Contraceptive counseling should cover both pregnancy and STI prevention. Identifying the individual adolescent's sexual practices, including high-risk sexual behaviors, is key to determine candidacy of each method. LARCs do not prevent STI exposure; therefore, the recommendation for dual protection is necessary. Using a LARC and condom together provides nearly 100% prevention against pregnancy and STIs. Counseling should address accurate and consistent use of condoms in association with a LARC. Routine follow-up with the adolescent to screen periodically for STIs and risk-taking behaviors, as well as reinforce healthy decision-making, is also recommended.

removed, an adolescent female will select more effective and long-acting contraceptive methods.³⁹ Under the Affordable Care Act, women—including adolescents—can choose from a wide range of contraceptive options without cost sharing for patients.⁸ The cost barrier remains a unique issue as private insurers and nonprofit organizations can exclude contraceptive services on the basis of religious or moral objections.⁴⁰ Federal subregulatory guidelines assert that insurers must cover all FDA-approved birth control methods without cost sharing unless an exemption is approved. Research suggests that if cost is removed as a barrier, adolescents will select LARC methods at a substantially higher rate.²⁹

Resources and patient assistance programs are available to patients who are eligible for financial assistance, including programs that provide levonorgestrel and copper IUDs at no cost for women without insurance coverage who meet eligibility criteria.^{41,42} Publicly funded Title X clinics have multiple programs for reduced-cost or no-cost contraceptives, benefiting low-income individuals nationwide.¹⁷ A web-based tool and support network is available to help users determine contraception services eligibility in each state.⁴⁰

Conclusion

Identifying areas where education and financial barriers exist is imperative to increasing LARC use among adolescents. Adolescent pregnancy remains a serious public concern in the US, both societally and financially. By providing unbiased, confidential education regarding all FDA-approved contraceptive options and addressing barriers of use, NPs can improve the rate of LARC use among adolescents. Evidence suggests that more-effective, long-acting contraceptive use among adolescents will have a positive impact on the adolescent pregnancy rate in the US. Determining which media communication tools are most effective at improving patient awareness can further improve LARC acceptance. 

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