



Contraception and Adolescents

Committee on Adolescence

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

ABSTRACT

Although adolescent pregnancy rates in the United States have decreased significantly over the past decade, births to adolescents remain both an individual and public health issue. As advocates for the health and well-being of all young people, the American Academy of Pediatrics strongly supports the recommendation that adolescents postpone consensual sexual activity until they are fully ready for the emotional, physical, and financial consequences of sex. The academy recognizes, however, that some young people will choose not to postpone sexual activity, and as health care providers, the responsibility of pediatricians includes helping teens reduce risks and negative health consequences associated with adolescent sexual behaviors, including unintended pregnancies and sexually transmitted infections. This policy statement provides the pediatrician with updated information on contraception methods and guidelines for counseling adolescents.

INTRODUCTION

Pediatricians have an important role in adolescent reproductive health care. Their long-term relationships with patients and families allow them to help promote healthy decision-making around sexuality and include abstinence as a way to avoid the negative consequences associated with risky sexual behaviors. As advocates for the health and well-being of young people, pediatricians communicate their recommendation to adolescent patients to postpone sexual activity until they are ready, because any sexual activity for which the adolescent is ill prepared may have emotional, physical, and financial consequences. However, clinicians recognize that some of their adolescent patients are sexually active or will choose to become so. Recent studies indicate that, for some adolescents, even participating in formal programs that advocate abstinence and signing abstinence pledges do not result in abstinent behavior.^{1,2} Pediatricians can have an active role in encouraging their adolescent patients to use contraception to reduce the risk of unintended pregnancies and to prevent sexually transmitted infections (STIs). In previous publications, the American Academy of Pediatrics (AAP) has addressed issues of adolescent sexuality, unwanted pregnancy, STIs, and contraception.³ This policy statement provides the pediatrician with updated information on adolescent sexual behavior, which may lead to pregnancy, including guidelines for counseling adolescents about available methods of contraception. Current methods available are discussed, as are methods in development.

ADOLESCENT SEXUAL BEHAVIOR AND USE OF CONTRACEPTION

Reported contraceptive use by adolescents has increased in recent years. From 1991 to 2005, the percentage of sexually active high school students who reported using a condom the last time they had sexual intercourse increased from 46.2% to

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Key Words

contraception, adolescents, pregnancy, sexually transmitted infections

Abbreviations

STI—sexually transmitted infection
AAP—American Academy of Pediatrics
OCP—oral contraceptive pill
FDA—Food and Drug Administration
DMPA—depot medroxyprogesterone acetate
BMD—bone mineral density
VTE—venous thromboembolism
IUD—intrauterine device

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62.8% in 2005.⁴ Despite this increase, consistent use of any contraceptive method remains a challenge for most adolescents.

Levels of reported sexual intercourse by adolescents in the United States decreased during the 1990s for both sexes after increasing for the previous 2 decades.⁴⁻⁶ The Centers for Disease Control and Prevention's 2005 Youth Risk Behavior Surveillance Summary indicated that less than half (46.8%, down from 49.9% in 1999) of all high school students reported having had sexual intercourse in their lifetimes, and approximately one third (34.3%, down from 37.5% in 1991 and 36.3% in 1999) of all students reported having sexual intercourse during the 3 months preceding the survey and are considered currently sexually active.⁴⁻⁶

Each year, almost 850 000 adolescent girls become pregnant. The adolescent pregnancy rate has dropped steadily over the past decade. As of 2004, it was estimated that approximately 41.2% of all pregnancies are to adolescents 15 to 19 years of age.⁷ Since 1991, the adolescent birth rate has declined by 33%, the lowest rate ever reported for the nation. The pregnancy rate for 15- to 17-year-olds has dropped by 43% to 22.1% of all pregnancies.⁷ Approximately 20% of abortions are in adolescents, although these rates continue to decrease.^{8,9} Decreases in pregnancy rates are thought to reflect a decrease in reported rates of sexual intercourse and an increase in reported use of longer-acting, more effective contraceptive agents.¹⁰⁻¹² Over the last decade, evaluations of curricula suggest that those with a comprehensive approach to sexuality education have been effective in improving sexual behaviors and, thus, may also contribute to this trend.¹³⁻¹⁵ Despite these declining rates of pregnancies and births, adolescent childbearing (22% of women report giving birth before age 20) is still more common in the United States than in other developed countries such as Great Britain (15%), Canada (11%), and France (6%).¹⁶

Providing information to adolescents about contraception does not result in increased rates of sexual activity, earlier age of first intercourse, or a greater number of partners.¹⁵ In fact, if adolescents perceive obstacles to obtaining contraception and condoms, they are more likely to experience negative outcomes related to sexual activity.¹⁷ Two school-based studies that demonstrated a delay of onset of sexual intercourse used a comprehensive approach to sexuality education that included a discussion of contraception.^{18,19}

Race, ethnicity, age, marital status, education, income, requirements for confidential care, and fertility intentions have all been demonstrated to affect contraceptive choice. Trends in methods of contraception used by adolescents over the past 2 decades show an increase in oral contraceptive pill (OCP) use and an increase in male condom use.²⁰ In recent years, the number of adolescents reporting OCP use has remained stable at ap-

proximately 18% to 20%.²¹ Use of injectable contraception by adolescents 15 to 19 years of age has increased from 0% to 13% between 1988 and 1995. A 9% decrease in contraceptive-failure-related pregnancies is attributed to the shift to longer-acting birth control methods.¹⁶

Factors that contribute to lack of contraceptive use or inconsistent use include issues related to adolescent development, such as reluctance to acknowledge one's sexual activity, belief that one is immune from the problems or consequences surrounding sexual intercourse or pregnancy, and denial of the possibility of pregnancy. Other important factors are lack of education and misconceptions regarding use or appropriateness of contraception. However, an adolescent's level of knowledge about how to use contraception effectively does not necessarily correlate with consistent use. Adolescents may not use or may delay use of contraception for several reasons including lack of parental monitoring, fear that their parents will find out, ambivalence, and the perception that birth control is dangerous or causes unwanted adverse effects such as weight gain.²²⁻²⁵

THE ROLE OF THE PEDIATRICIAN

Pediatricians should encourage abstinence and provide appropriate risk-reduction counseling regarding sexual behaviors. Ideally, counseling should include discussion about the prevention of STIs, education on contraceptive methods, and family planning services for the sexually active patient. Such discussion necessarily takes place within the context of an individual patient's physical and emotional development as well as his or her social situation. Although pediatricians are optimally suited for such inquiry, we recognize that not every visit will allow the time required. The demands of comprehensive patient evaluation, counseling, and treatment are daunting, indeed, but are part of the ongoing education of teens and often other family members. This report is intended as a guide and, we hope, is helpful to busy clinicians.

When contraceptive services are provided in the pediatrician's office, policies and procedures that address the provision of such services, including confidentiality, should be developed and then explained to families before the provision of such services is ever needed.^{26,27}

Counseling Adolescents About Contraception

Comprehensive health care of adolescents should include a confidential sexual history that should be obtained in a safe, nonthreatening environment through open, honest, and nonjudgmental communication with assurances of confidentiality. During the preadolescent years, the pediatrician can provide anticipatory guidance by discussing puberty and offering health education materials to both the youth and his or her family. At the onset of puberty, the patient's history should include

information on both the family's and the patient's attitudes and knowledge about sexual behaviors and the degree of involvement in sexual activity. General information may be offered or accessible to both the family and patient about methods of contraception and their uses. In addition, around this time, health maintenance visits should begin to include private, confidential time with the adolescent to establish rapport as well as assess degree of involvement in sexual activity. For sexually active adolescents who use contraception, the role of the health care professional is to educate and support compliance, to assist in managing adverse effects or, alternatively, to counsel the patient regarding a new contraceptive method as circumstances require, and to provide referrals and follow-up with periodic screening for STIs. Throughout adolescence, comprehensive sexuality education that includes discussion of abstinence, appropriate contraceptive use, and protection from STIs should be provided as part of healthy sexual development. When initiating any hormonal contraceptive method, the need for consistent protection against STIs (either male or female condoms) should be reinforced.

Confidentiality and Consent

The primary reason that adolescents may hesitate or delay obtaining family planning or contraceptive services is concern about lack of confidentiality.^{25,28} It is important for pediatricians to develop office policies that ensure patient confidentiality. State requirements and standards of practice should be reviewed, and the development of clear, concise, and standardized office protocols for confidentiality should be developed for staff, patients, and parents.²⁹ These policies should include information and education regarding when confidentiality must be waived, guidelines for reimbursement of services, medical chart access, appointment scheduling, and information disclosure.

For those patients whose parents are unaware of their contraceptive use, it may be helpful to discuss with the adolescent patient how the contraceptive method will be consistently used in all circumstances. Consistent adolescent contraceptive use is often derailed during weekends away, family vacations, adolescents' trips to stay with other relatives, and/or visits to noncustodial parents.

Sexual Responsibility

Pediatricians can help adolescents identify their own goals for safe and responsible sexual behavior, including reinforcing and supporting abstinence. The promotion of healthy and responsible sexual decision-making is one of the goals of counseling adolescents about contraception. Successful counseling requires a supportive and nonjudgmental pediatrician who engages in effective dialogue, which includes skillful history taking, careful lis-

tening, and repetition of simple educational messages that contain essential information.^{26,30}

Sexual Decision-Making

Adolescents should be strongly encouraged to postpone or delay the initiation of sexual activity. For patients who are already engaged in sexual intercourse or who are contemplating having sexual intercourse, a discussion of contraceptive methods and prevention of STIs (including HIV and AIDS) is essential. Condom use should always be reinforced, and teens must be reminded that, for some STIs, condoms are not totally protective. Adolescents should be made aware, in a nonthreatening and nonjudgmental manner, that although condom use is essential and may be life-saving, any individual who engages in sexual contact is at risk of contracting STIs that are transmitted through sexual contact, such as herpes simplex and human papillomaviruses, rather than body-fluid exchange, such as gonorrhea and trichomoniasis. Discussions should address and explore the adolescent's reasons for becoming sexually active and the effect that sexual intercourse may have on relationships with peers, parents, and significant others. Clinicians may also find it useful to explore with the adolescent how he or she believes the sexual experiences will change his or her own self-image. Adolescent sexual decision-making has emerged in recent studies as a complex interplay between an adolescent's perception of peer-group expectations, personal self-image, values, and desires and media influences.³⁰⁻³³ However, a caring, nonjudgmental yet informative, nonparental adult can wield substantial influence in teens' sexual decision-making; teens cite lack of such a person as a missing key feature of sexuality education.³⁴ Pediatricians, therefore, may have some influence in adolescent sexual decision-making and are especially well positioned to assess risk-taking behaviors in the area of sexuality.³⁵

ADOLESCENTS WITH DISABILITIES

The issue of contraception for adolescents with chronic illness or disability is often forgotten. An estimated 10% to 20% of children and adolescents experience a disability or chronic illness by the age of 20 years.³⁶ Recent data from the National Longitudinal Study of Adolescent Health has shown that physically disabled adolescents are as sexually experienced as adolescents without disabilities. Attitudes about contraceptives as well as sexuality education and counseling needs within this population should not be overlooked.³⁷ A list of additional resources for clinicians who desire more information about contraception for adolescents with chronic illness and/or disability is included at the end of this statement.

METHODS OF CONTRACEPTION

Numerous reviews and protocols for prescribing and managing contraception are available. The following section focuses on the appropriateness of various contraceptive methods available for adolescents. The pediatrician should emphasize the need for STI prevention as well as contraception with each patient at each visit.^{17,38}

Abstinence

Abstinence is the most effective means of birth control and prevention of STIs and is a viable strategy in the clinician's toolkit for reducing unintended pregnancy and achieve reduction in STI rates. Abstinence education generally focuses on delaying the initiation of adolescent sexual activity until marriage or adulthood. Many schools have adopted abstinence-dominant or abstinence-only education programs for school sexuality curricula. To date, the evidence regarding the efficacy of such interventions in the reduction of risky sexual behaviors, including risk for STIs, has not been proven.^{14,39} No data have directly examined how well abstinence counseling works to reduce an individual's pregnancy and STI risk. In practice, many adolescents who intend to be abstinent often fail and have sex. A longitudinal analysis of teens and virginity pledges compared pledgers to nonpledgers and found at a 6-year follow-up that 88% of pledgers reported experiencing premarital sex and had STI rates that, statistically, were no different from those of nonpledgers.² A recent article provides some practical tips for abstinence counseling within an office-based setting using a comprehensive perspective including motivational interviewing.⁴⁰

Several published studies and evaluations have suggested that comprehensive sexuality education is an effective strategy for helping young people delay initiation of sexual intercourse. In addition, research has shown that these programs do not hasten the onset or frequency of sexual intercourse and do not increase the number of partners that sexually active teens have.¹⁵

There is some consensus that sexuality education and interventions with some abstinence-based or "abstinence-plus" curriculum components are most effective when targeted at younger adolescents before they become sexually active.^{1,41} Some recent studies demonstrated the importance of youth, parent, physician, and education partnerships for the prevention of health risk behaviors such as early initiation of sexual intercourse.^{13,42} One study illustrated that an abstinence-only curriculum had no significant impact on the initiation of sex, the frequency of sex among those students who had ever had sex, or the number of sexual partners among those who had ever had sex. Two other studies produced similar results.¹ The AAP supports a comprehensive approach to sexuality education for adolescents. Abstinence should play a part in any comprehensive discussion of sexuality, and resources should be made available

for adolescents who feel pressured, but prefer not, to engage in sexual activity.

For some adolescents, abstinence may be a difficult choice. Adolescents who choose to abstain from sexual intercourse should be encouraged and supported by their parents, peers, and society (including the media) and especially by their pediatricians. Adolescents need to know about other contraceptive options before (or if) they decide to have intercourse.

Male and Female Condoms

The male condom is a mechanical barrier method of contraception. The failure rate at the end of first-year use for the male latex condom is 3% with perfect use and as much as 14% with typical use.⁴³ Latex condoms significantly reduce the transmission of some STIs and, therefore, should be used by all sexually active adolescents regardless of whether an additional method of contraception is used. Male condoms have several other advantages for adolescents, including involving males in the responsibility of contraception, easy accessibility and availability to minors, use without a prescription, and low cost.⁴⁴ Polyurethane condoms can be used by adolescents with a documented latex allergy; however, latex condoms are preferred, because they have a higher efficacy rate with typical use than polyurethane condoms.⁴³ Some adolescents may have local reactions to condoms that have been pretreated with spermicide and should be counseled that condoms without these agents are also available. Nonoxynol-9 is the only chemical agent in spermicidal products available in the United States; there are nonspermicidal hypoallergenic lubricants available over the counter. Only water-based lubricants may be used with latex condoms, and both water- and oil-based products may be used with polyurethane condoms.⁴⁴ Currently, there is a general movement away from products with nonoxynol-9 because of concerns that use increases risk of genital ulceration and irritation, which may facilitate the acquisition of STIs.⁴⁴ Condom use reported at most recent intercourse by females was 54% and by males was 71%, which is an increase in the last decade.²⁰ Surveys of high school students over the last decade indicate that condom use has increased, with condom use at last intercourse increasing from 46.2% in 1991 to 62.8% in 2005.⁴

The female condom, another barrier method of contraception, provides contraceptive efficacy in the same range as other barrier methods, such as the diaphragm and cervical cap (with typical use).⁴⁵ One trial of the most widely available female condom on the market yielded a failure rate of 0.8% with perfect use and between 12% and 15% with typical use.⁴⁶ The female condom also helps protect against STIs. Adolescents' concerns about using a female condom include difficulty of insertion, higher cost than male condoms, and appearance and noisiness of the device. Female adolescents

have reported that the female condom could be useful if their male partners did not want to use a condom. Further education on using the female condom is needed for both genders. For adolescents who already use male condoms, it is important to market the female condom as an alternative contraceptive choice, because male and female condoms should not be used simultaneously.⁴⁷ Male condoms are preferred over female condoms because of higher efficacy rates of preventing pregnancy and STIs and lower cost.

Vaginal Spermicides

Vaginal spermicides are a chemical barrier method of contraception applied intravaginally through a variety of forms: gel, foam, suppository, or film. Spermicides consist of 2 components: a formulation (the gel, foam, suppository, or film) and the chemical ingredient that kills the sperm (eg, nonoxynol-9). As with any barrier method, the effectiveness of spermicides depends on consistent and correct use. The combination of vaginal spermicide and condoms is a very effective means of contraception for adolescents, because it provides effective prevention of pregnancy, reduces the risk of contracting an STI, is available without a prescription, and is inexpensive.⁴⁸

There has been a question as to whether use of nonoxynol-9 alone provides adequate protection against STIs and HIV. In high doses, nonoxynol-9 can irritate the vaginal lining, which makes young women more susceptible to HIV transmission. The Centers for Disease Control and Prevention have concluded that women should be discouraged from using nonoxynol-9 alone for STI and HIV protection, because 1 study found that a product containing nonoxynol-9 did not protect against HIV infection and may have caused an even greater likelihood of transmission as compared with a vaginal lubricant.^{49,50} Use of spermicide alone is not advocated as a contraceptive method; condoms must be used in conjunction with vaginal spermicides for protection against STIs

Oral Contraceptives

OCPs are a reliable, effective method for the prevention of pregnancy, are available only by prescription in the United States, and are the most popular method of prescribed contraceptive among adolescents.²¹ Of the 2.7 million adolescent women who use contraceptives, 44% rely on the pill.⁵¹ The Youth Risk Behavior Surveillance Summary reported that in both males and females who had sexual intercourse during the 3 months before the survey, the percentage who used birth control pills to prevent pregnancy during last sexual intercourse was 17.6% in 2005, down from 20.8% in 1991.⁴

Three forms of OCPs are currently available: the fixed-dose, monophasic combination (each tablet contains the same dose of estrogen and progestin); the pha-

sic dose (the triphasic and biphasic packs that contain varying doses of estrogen and progestin); and the mini-pill (which contains progestin only). Many of the newer forms of birth control pills have a low dose of estrogen (20–35 μg) and contain new forms of progestin. These low-dose pills are typically the “first-line” therapy for OCP initiation. There is theoretic potential for lowered efficacy of low-dose OCPs in patients who are taking some medications. Some common medications that increase the metabolism of synthetic steroids by increasing conjugation in the gut and enzyme induction in the liver are listed in Table 1.^{52–54} In this clinical situation, prescription of OCPs that contain 50 μg of ethinyl estradiol or switching to a hormonal method that avoids first-pass metabolism, such as injectable progestin, may be indicated; efficacy of transdermal or intravaginal contraceptives with these medications are not known. Generally, the standard 28-day pack of pills (21 days of hormone and 7 days of placebo) is prescribed for teens, and daily compliance is encouraged, particularly over the 21 days of hormone-containing pills to maximize efficacy and minimize bleeding irregularities.⁵⁵ The 21-day packs, if available, are better for adolescents who are taking OCPs in continuous or extended cycles.

The US Food and Drug Administration (FDA) recently approved a monophasic 30- μg ethinyl estradiol/0.15-mg levonorgestrel pill for extended cycling called Seasonale (Barr Pharmaceuticals, Woodcliff Lake, NJ). This formulation provides 84 days of continuous hormonally active pills followed by 7 days of placebo. This formulation may be particularly appropriate for adolescents with medical conditions such as anemia, severe dysmenorrhea, endometriosis, dysfunctional uterine bleeding, or Von Willebrand and other bleeding diatheses and adolescents who prefer amenorrhea.⁵⁶ In addition, adolescents who frequently miss OCPs may have lower failure rates when using continuous or extended regimens of OCPs with shorter or no placebo intervals.

TABLE 1 Medications That Decrease OCP Efficacy

Antibiotics	Rifampin (Rifadin, Rimactane)
Anticonvulsants	Felbamate (Felbatol)
	Ethosuximide (Zarontin)
	Primidone (Myidone, Mysoline)
	Phenobarbital (Solfoton, Barbita, Luminal)
	Phenytoin (Dilantin, Phenytek)
	Carbamazepine (Tegretol)
	Oxcarbazepine (Trileptal)
	Topiramate (Topamax)
Antidepressants	St John's wort
Antifungal agents	Griseofulvin (Fulvicin, Grifulvin, Grisactin, Gris-PEG)
Anti-HIV drugs	Protease inhibitors
	Nonnucleoside reverse transcriptase inhibitors

The noncontraceptive benefits of OCP use include improvement in acne and decreased menstrual cramping, pain, blood loss, and ovarian cysts. OCP use that exceeds 3 years provides significant protection against endometrial and ovarian cancers. Overall, observational data indicate that OCP use does not increase risk of breast cancer. Adverse effects include nausea, breast tenderness, headaches, and breakthrough bleeding. OCPs are one of the best-studied medications ever prescribed and are a safe option throughout a woman's reproductive years, because the method is completely reversible and has no negative effect on long-term fertility.⁵⁷

OCPs have a failure rate of 0.1% when used perfectly. However, failure rates range between 5% and 8% with typical use and for adolescents may reach 15% to 26% because of noncompliance.⁵⁸ Adolescents may have difficulty complying with OCPs because of forgetfulness, attempts to hide contraception from parents, and inconsistency of sexual relations, among other reasons. The National Survey on Family Growth reported that as many as 42% of adolescents 15 to 19 years of age missed 2 or more pills in a 3-month period.⁵⁷ Adolescent compliance with OCP use may be enhanced by appropriate patient education and problem-solving techniques, which includes careful instruction regarding the use of OCPs; anticipatory guidance about adverse effects and their management; a discussion of correct pill usage (including when the first pill should be taken during the menstrual cycle or what to do if a pill or pills are late or missed); use of emergency contraception; and frequent follow-up and monitoring. Patients should also be encouraged to use condoms in conjunction with OCPs to provide protection against STIs and additional pregnancy prevention. In addition, when possible, involving the patient's mother can greatly enhance compliance with pill taking.⁵⁹

OCPs have few contraindications in healthy female adolescents. Estrogen-containing OCPs are contraindicated for those with a history of thromboembolism or thrombophilia (ie, factor V Leiden mutation or protein C, protein S, or antithrombin III deficiencies); cyanotic heart disease or pulmonary artery hypertension; systemic lupus erythematosus associated with antiphospholipid antibody syndrome or renal disease, particularly associated with hypertension; or hepatic dysfunction. Patients who are taking anticonvulsant medications and HIV medications need to be counseled carefully and may be encouraged to use injectable progestins (Table 1).

Adolescents need not receive a complete gynecologic examination by the pediatrician before initiating OCPs or any other hormonal contraceptive method.⁶⁰ In most circumstances, the pelvic examination may be deferred and OCPs may be prescribed if the patient is healthy, is not pregnant, and has no contraindications to taking the pills. An inspection of the external genitalia and either a urine screen or vaginal swab for STIs may be substituted

for a pelvic examination as a screening for initiation of contraceptive use. A pelvic examination is indicated for most situations in which abdominal pain is part of the presenting complaint in a sexually experienced adolescent. Sexually active female adolescents should be screened for STIs, especially chlamydia, at least annually and preferably with each new sexual partner.⁶¹ Guidelines from the American Cancer Society and the American College of Obstetricians and Gynecologists recommend initiation of Papanicolaou (Pap) test screening within 3 years of first intercourse (whether consensual or nonconsensual) or by 21 years of age.⁶²

Injectable Hormonal Contraception

Depot medroxyprogesterone acetate (DMPA) injection is a long-acting progestin that is given every 12 weeks (11–13 weeks) as a single 150-mg intramuscular dose. This method of contraception, also known by the brand name Depo-Provera (Pfizer, New York, NY), is highly effective in preventing pregnancy. In the first year of use, the probability of becoming pregnant is approximately 0.3%.⁶³ Available since 1992 in the United States, some experts believe that the use of this method since 1992 among adolescents who are at high risk of becoming pregnant is one factor responsible for the declining rates of adolescent pregnancy in the United States.¹⁷ This method is convenient for women who do not want to have to remember to take their pill each day, cannot use the patch, or cannot use a contraceptive at the actual time of intercourse.¹⁶ Other advantages include lack of estrogen-related adverse effects and, similar to OCPs, protection against endometrial cancer and iron-deficiency anemia.⁶⁴

The major disadvantage of this contraceptive method for adolescents are menstrual cycle irregularities (present for nearly all patients initially), the need for intramuscular administration every 11 to 13 weeks, and potential adverse effects including acne, weight gain, headaches, and bloating. A new formulation, which is administered subcutaneously, contains 104 mg of medroxyprogesterone acetate (Depo-Subq Provera 104 [Pfizer]), and is given on the same dosing schedule as the intramuscular formulation, is now available. The subcutaneous route makes home administration of Depot-Provera possible, although there have been no studies of home use in the adolescent population. The lower dose could decrease suppression of pituitary function and ovarian estradiol production, although no conclusive data are yet available to indicate such an effect.⁶⁵ Two large open-label phase-3 studies have found subcutaneous DMPA to be equally effective as intramuscular DMPA; however, the irregular uterine bleeding that many patients complain of after initiating the drug also accompanies subcutaneous use. As with the intramuscular route, this adverse effect largely resolves over the

first year of use: amenorrhea increased from 26% of patients in month 3 of use to 55% during month 12.⁶⁶

In addition to uterine bleeding irregularities, DMPA use over a prolonged period is associated with a delayed return to fertility, typically 9 to 18 months, while the endometrial lining returns to its pre-DMPA state and ovulatory function returns. Both subcutaneous and intramuscular DMPA show similar delays to fertility after injection.⁶⁷ However, for adolescent patients, such a delay does not usually pose a major deterrent to using this method. Both intramuscular and subcutaneous DMPA may be safely recommended for adolescents who have chronic illnesses (eg, seizures, sickle cell disease), are lactating, or are at risk of estrogen-related complications.⁶⁴

Pediatricians should discuss potential adverse effects. Studies have shown that patients are more likely to continue DMPA use if they are counseled about potential irregular bleeding before their first injection, but these studies did not target adolescents specifically.⁶⁸ Clinicians must also ensure that the patient is not pregnant at the time of the initial injection and at each injection that occurs at an interval greater than 12 weeks.

Because DMPA suppresses circulating estradiol concentrations, it causes reductions in bone mineral density (BMD), which has generated some concern regarding the long-term effects. A prospective cohort study of adolescents aged 12 to 18 years found that BMD decreased 3.1% after 2 years of DMPA use, whereas BMD increased 9.5% in the controls who were using no hormonal method of contraception.⁶⁹ Some other studies have indicated an adverse impact on biochemical markers of bone formation and resorption as well as the decreased BMD.⁷⁰⁻⁷² In response to these concerns, the FDA issued a "black-box" warning regarding the risk of decreased BMD among DMPA users in November 2004.⁷³ Currently, the warning recommends limiting the use of DMPA to 2 years and using DMPA as long-term contraception only if other methods are inadequate. The warning also emphasized the lack of certainty regarding peak BMD attained later in life among users of DMPA, but experts think such a restriction may be unwarranted, especially for patients with no other alternatives for contraception. A recently published study of teens and young adult women documented complete recovery of BMD after DMPA use, thus offering some degree of reassurance about use not affecting long-term skeletal health of adolescent patients.⁷⁴ In addition, an increased incidence of fractures has not been reported in adolescents using DMPA.

It is important to consider other risk factors for osteoporosis and to tailor counseling and recommendations to each patient. Factors such as small body habitus, chronic alcohol or tobacco use, eating disorders, or illness that necessitates chronic use of corticosteroids may lead a

clinician to recommend against DMPA use more strongly. All patients should be encouraged to include foods and/or supplements to ensure intake of at least 1300 mg of calcium each day along with 400 IU of vitamin D, to participate in weight-bearing exercise regularly, and to stop smoking as important measures to promote skeletal health. Using supplemental estrogen has been observed to prevent loss of BMD in 1 study of teens, whereas the use by teens of antiresorptive medications prescribed for postmenopausal women is definitely not recommended.⁷⁵ As with all hormonal methods of contraception, condoms should be used in conjunction with DMPA for protection from STIs.

Another injectable hormonal contraceptive (known by the product name Lunelle [previously manufactured by Pharmacia & Upjohn, Kalamazoo, MI]) combined estrogen and medroxyprogesterone acetate. Lunelle was made available in the United States after confirmation of safety in clinical trials in the United States and internationally. However, Lunelle was voluntarily withdrawn from the market by its manufacturer in September 2002 because some doses may not have contained enough hormone to prevent pregnancy. Women who used Lunelle required monthly clinic visits for the injection of medications. Adverse effects were similar to those of Depo-Provera and included weight gain, menstrual irregularity, headaches, and breast tenderness, although adverse effects were fewer than in trials with DMPA alone.^{76,77} A general acceptance of and overall satisfaction with Lunelle by women in clinical trials suggested that this method was widely accepted, but its return into the market is not expected in the future.

Progestin Implants

Levonorgestrel implants, also known by the brand name Norplant (previously manufactured by Wyeth-Ayerst Laboratories, St Davids, PA), were highly effective long-acting progestin-only contraceptives that provided pregnancy prevention for up to 5 years. These implants required insertion of subcutaneous polymeric silicone capsules into the upper arm by a trained health care professional. The 6-rod Norplant system was the first progestin implant available in the United States but has been permanently removed from the US market.⁷⁸ Implanon (Organon USA, Roseland, NJ), a single-rod implant that contains etonogestrel, the active metabolite of desogestrel, has been used in Europe since 1998 and is now available in some areas of the United States. Highly effective (in clinical trials, no unintended pregnancies were reported in ~73 000 cycles), Implanon may remain in place for 3 years, but it is associated with irregular bleeding in many users, especially during the first year of use.⁶³

Levonorgestrel implants are ideal for adolescents who desire an extended length of protection, feel unable to remember to take OCPs, or have already had 1 preg-

nancy. It is also an excellent contraceptive option for females who may have difficulty remembering to use a contraceptive on a daily basis or at the time of intercourse. The major disadvantages for use in the adolescent population include high initial cost and potential adverse effects such as breakthrough bleeding and headaches. The drugs listed in Table 1 also impair the efficacy of levonorgestrel implants. The difficulty of removal of the implant, in combination with these other disadvantages, made Norplant an unpopular form of contraception for adolescents, and although Implanon is easier to remove, it shares many of Norplant's adverse effects. In addition, condoms must be used in conjunction with progestin implants for protection against STIs.⁶³

Other Combined Hormonal Contraceptive Methods (NuvaRing and Ortho Evra)

The vaginal ring (NuvaRing [Organon USA]; 15 μg ethinyl estradiol/120 μg etonogestrel) is a round, flexible device that measures 54 mm in outer diameter and 4 mm cross-sectionally; it is inserted in the vagina and stays in place for 3 weeks, with removal for 1 week to induce menstruation followed by insertion of a new ring. This soft silicone vaginal ring releases both estrogen and progestin hormones that protect against pregnancy for 1 month. The ring has been shown to have greater than 99% efficacy when used correctly by adult women. However, trials with adolescent populations have not been conducted. Compliance with the ring is high, and few adverse effects are experienced. Adverse effects would be the same as other combined hormonal methods, which include breast tenderness, headaches, nausea, and some breakthrough bleeding/spotting and an increased risk of the more serious condition of thrombotic events; local adverse effects may include vaginal symptoms of discharge, discomfort, and device problems.⁵⁵

The combination hormonal transdermal adhesive skin patch (Ortho Evra [Ortho-McNeil Pharmaceutical, Raritan, NJ]) can be applied to the abdomen, upper torso, upper outer arm, or buttocks weekly by using 1 patch for each of 3 weeks in a row, followed by 1 week off the patch, during which a withdrawal bleed usually occurs. While in place, the 4.5-cm³ contraceptive patch delivers 150 μg of norelgestromin and 20 μg of ethinyl estradiol daily. Efficacy rates from 1 study suggested that the overall annual probability of pregnancy was 0.8%, whereas the method failure probability was 0.6%, similar across age and racial groups.⁵⁵

One study reported that women who use the patch are no more likely to become pregnant than women who use a combination OCP. At least 1 study indicated a higher rate of local adverse effects with adolescents who use the patch than with older patients; these effects include patches dislodging as well as irritation and hyperpigmentation.^{79–81} Very concrete counseling re-

garding patch placement with adolescent patients, and perhaps even demonstration of initial placement, is helpful.⁸¹

Although compliance with using the patch is improved compared with OCPs, the risk of pregnancy with correct use of the patch was higher for women who weigh more than 198 pounds (0.9% in first 12 months of use) compared with women who weigh less (0.3%).^{82,83} Obviously, the risks of pregnancy must be discussed as methods are considered; a pregnancy rate of 1% at the end of 1 year in a patient who weighs more than 200 pounds, refuses other methods, and chooses to remain sexually active is a more acceptable alternative than a pregnancy risk of 85% with no protection. For issues related to compliance, the added value of the patch should be considered. It has demonstrated increased compliance, which results in fewer contraceptive failures. Other possible adverse effects of combined hormone methods include temporary irregular bleeding, temporary breast discomfort, weight gain or loss, and nausea.

The most concerning possible adverse effect of transdermal contraception or any combined hormone method is risk of thrombotic events. In the large clinical trials of the transdermal contraceptive patch, 1 case of nonfatal pulmonary embolism occurred during use of the patch, and 1 case of postoperative nonfatal pulmonary embolism was reported. Recently, the higher bioavailability of estrogens delivered transdermally has prompted Ortho McNeil Pharmaceutical to issue a warning specifically related to risk of thrombotic events in Ortho Evra users.⁸⁴ An increased risk of venous thromboembolic disorders has been associated with the use of combination hormonal oral contraceptives compared with nonusers; generally, increases in rates by a factor of 3 to 6 have been reported in studies that evaluated healthy young women who had no other risk factors. A review of studies compared the risk of nonfatal venous thromboembolism (VTE) among different OCPs. The authors found that users of OCPs containing desogestrel, a third-generation progestin, had an increased risk compared with users of OCPs containing levonorgestrel.⁸⁵ Thus, a baseline risk for VTE of 1 per 10 000 person-years is increased to 3 to 4 per 10 000 person-years during the time when oral contraceptives are being used.⁸⁵ The risk is much greater in those over age 35 and those who smoke, especially if cigarette use equals or exceeds 15 cigarettes daily. Although smoking should be discouraged for teens and young adults, smoking and use of combined hormone methods of contraception are not contraindicated in this age group.⁸⁶ Whether the patch places teens and women at increased risk of VTEs compared with combined hormone OCPs is not known, because 2 different studies with different methodologies had different outcomes.⁸⁷ No studies to date have directly examined whether the patch increases the risk of

thrombotic events compared with other types of estrogen-containing methods. The risk of VTE is slightly elevated but still quite low for anyone on an estrogen-containing method compared with not being on a method. The risk of VTE associated with pregnancy should be weighed against the risks of the patch or any combined hormone method. Compared with the risk of VTE during pregnancy, risk of VTE associated with combined hormone methods is considered lower in healthy young women.⁵⁵

As with oral or transvaginal combined contraceptives, condoms must be used in conjunction with each method for protection against STIs.

Intrauterine Devices

Intrauterine devices (IUDs) are inserted into the uterus and release hormones, ions, or enzymes that prevent sperm from fertilizing the ova or prevent implantation. The effectiveness of IUDs is influenced by several factors, including size of the IUD surface area and the type of IUD used. When used appropriately, IUDs are generally safe, effective methods of contraception with a failure rate of less than 1%. Condoms must be used in conjunction with IUDs for protection against STIs. IUDs have previously not been recommended for adolescents; risk of infection in teens (who often have multiple partners or are serially monogamous) and liability concerns (a patient who has not conceived before using an IUD may attribute future infertility to IUD use) have contributed to clinicians' reluctance to prescribe this method for adolescent patients. IUDs have not been shown to affect fertility in the absence of infection; however, STI rates in adolescent populations are certainly cautionary. In some cases, however, an IUD may be appropriate for an adolescent who already has children and is taking precautions to protect against STIs. Mirena (Berlex, Montville, NJ), a newly developed IUD that contains the progestin levonorgestrel, gradually releases the progestin over an effective period of 5 years and has a failure rate of 0.3%. This IUD may be particularly useful for adolescents with severe menorrhagia and dysmenorrhea, as has been shown in adult women. Also available is the copper IUD called ParaGard, which releases a small amount of copper that kills or immobilizes sperm before they can fertilize an egg. The ParaGard can be removed at any time but should be replaced after 10 years.⁸⁸

Diaphragm and Cervical Cap

The diaphragm and cervical cap are barrier methods of contraception that also require use of a spermicide. Diaphragms are flexible latex cups that are inserted into the vagina before intercourse and must remain in place for 6 hours after intercourse. Cervical caps are latex or silicone cups with a firm rim that adhere to the cervix and provide continuous contraceptive protection for up to 48 hours. Because of risk of toxic shock syndrome,

caps should not remain for more than 48 hours.⁸⁹ Consistent, correct use of these methods is critical for achieving a high rate of effectiveness. The failure rate of the diaphragm with perfect use is 6% and with typical use is 20%; for the cervical cap, the failure rate is 26% with perfect use and 40% with typical use.⁸⁹ These contraceptive methods may not be feasible for some adolescents, because they require a prescription and visit with a health care professional for a fitting, because 1 size does not fit all. The adolescent must also be comfortable and skilled with insertion. Incidence of urinary tract infection increases over baseline with both diaphragms and cervical caps; in addition, condoms must be used in conjunction with these devices for protection against STIs.⁸⁹

Withdrawal

The withdrawal method, which involves the male partner's attempt to withdraw the penis before ejaculation, is still widely used by adolescents in sexual relationships. Adolescents should receive counseling that emphasizes the high failure rate of withdrawal for pregnancy prevention. On average, of every 100 women whose partners use withdrawal, 19 will become pregnant during the first year of typical use. It is important to stress that preejaculatory fluid can contain enough sperm to cause pregnancy. Pregnancy is also possible if semen or preejaculate leaks out onto the vulva. In addition, providers should stress that this contraceptive method does not provide protection against STIs.⁹⁰

Fertility Awareness and Other Periodic Abstinence Methods

Using fertility-awareness methods as a contraceptive option depends on several factors and requires a strong knowledge of the menstrual cycle and reproductive fertility. This method involves the identification of fertile days within each menstrual cycle when intercourse is most likely to result in pregnancy. Couples can abstain during the fertile times of a woman's cycle or use a combination of either barrier or withdrawal methods. As many as 25% of users of these methods will experience an unintended pregnancy within the first year of use, with some estimates of the pregnancy rate even higher.⁹¹ To optimize method efficacy, users of this method should track their menses on a calendar for 3 months while also checking and recording their basal body temperature daily and should check their cervical mucus consistency to track when they ovulate. Pediatricians should be prepared to teach adolescents about the menstrual cycle but should emphasize that ovulation may not be predictable in the first few year(s) after menarche. Thus, abstinence or more reliable methods should be recommended for adolescents. In addition, health care professionals should stress that this contraceptive method provides no protection against STIs if no barrier methods are used during periods of sexual activity.

Emergency Contraception

Emergency contraception can be administered in 2 ways: by orally administering hormones or by inserting a copper-releasing IUD. An IUD can be inserted to prevent pregnancy up to 5 days after unprotected intercourse but is usually not recommended for adolescents (see IUD section).

The most commonly prescribed and best-studied methods of emergency contraception are the combined estrogen-progestin (also called the Yuzpe regimen) and progestin-only regimens. There is now only 1 dedicated product for emergency contraception: Plan B (DuraMed Pharmaceuticals, Pomona, NY). Plan B, a progestin-only regimen that contains levonorgestrel, is widely available as 2 hormone pills that are taken within 72 hours of unprotected intercourse. The most recent data support extending the time limit of use to 120 hours after unprotected intercourse; however, emergency contraception's efficacy diminishes as hormonal administration becomes more remote from the unprotected intercourse event.⁹²⁻⁹⁴ Adolescent patients especially should be counseled that Plan B is 90% effective if used within 24 hours, 75% effective if used within 72 hours, and approximately 60% effective if used within 120 hours. The Plan B regimen can now be simplified to give both tablets at one time without sacrificing efficacy or resulting in more adverse effects.⁹⁴ Combination OCPs may be used for emergency contraception when Plan B is not readily available; the dose depends on the specific product chosen.⁹⁵ A recent study found that combination OCPs with progestin norethindrone can also be used effectively for emergency contraception. This study found that even a single dose of the oral contraceptives or combined hormone method was effective for emergency contraception.⁹⁶ Adverse effects may include nausea, vomiting, and changes in the menstrual cycle during the month of use. The progestin-only regimen is generally preferred, because it is more effective and causes fewer adverse effects.^{97,98} Overall, emergency contraceptives reduce the risk of pregnancy after unprotected sex by at least 74%.^{99,100}

Most women who need emergency contraception can use it safely. If the patient or practitioner suspects pregnancy, a pregnancy test can be administered; however, pregnancy testing before emergency contraceptive use is not necessary. It is important to note that emergency contraception does not cause abortion and it is not teratogenic if taken in early pregnancy. Women who are already pregnant should not use emergency contraceptives because they are ineffective at terminating established pregnancies; however, using them inadvertently will not have an adverse effect on the fetus.⁹⁹ Six studies have found that providing emergency contraception in advance increases the likelihood of women using it when it is needed and does not increase sexual or contraceptive risk-taking behavior.¹⁰¹⁻¹⁰⁶

As the AAP states in its policy statement on emergency contraception, reduction of unintended pregnancy is best achieved by strategies that include developing and implementing programs to help delay and reduce sexual activity and increasing the use of effective contraceptives.⁹⁵ However, the AAP continues to support improved availability of emergency contraception to adolescents and advocates clinicians' consideration of advance emergency contraception prescription to sexually active adolescents, recognizing that in some cases, emergency contraception may be quite valuable in preventing unintended pregnancy and that emergency contraception is most effective when used soon after unprotected intercourse.⁹⁵ Recently, the FDA approved over-the-counter access for Plan B for women 18 years and older, but Plan B still requires a prescription for those younger than 18 years.¹⁰⁷ In view of the potential value of emergency contraception, pediatricians should inform adolescents about the availability of emergency contraception; however, it should not be advocated as a routine method of contraception.

Newer Forms/Formulations of Contraception

The FDA recently approved the first chewable OCP, Ovcon 35 (Bristol Myers Squibb Company, Princeton, NJ), a spearmint-flavored, 28-day regimen pill that contains the same hormones used in standard OCPs. Women who chew the pills instead of swallowing them should drink 8 oz of liquid afterward to ensure that the full dose reaches the stomach.¹⁰⁸ Another method recently approved by the FDA is the FemCap, a soft silicone dome that covers the cervix. FemCap will be available by prescription in 3 sizes and is designed to last 48 hours per use.^{89,109} New forms of contraception for males are also being studied, including an implantation system similar to Norplant, weekly and monthly hormone injections, and a contraceptive patch.¹¹⁰ A progestin-only vaginal ring is being developed, and Norplant II (a 2-rod system as opposed to the 6-rod system in Norplant) is awaiting FDA approval. Condoms must be used in conjunction with these new forms of contraception for protection against STIs.

COMPLIANCE AND FOLLOW-UP

Frequent follow-up is important to maximize compliance for all methods of contraception, to promote and reinforce healthy decision-making, and to screen periodically for risk-taking behaviors and STIs. Follow-up visits should include periodic examinations, reassessment for contraception method, STI surveillance, and cervical cytologic screening (Papanicolaou test) when appropriate. The timing and frequency of reassessment will vary depending on the contraceptive method. In general, sexually active adolescents should have annual STI screening with consideration for repeat screening for chlamydia 3 to 6 months after a positive test result and

treatment and/or with each new partner.¹¹¹ Regularly scheduled visits need to occur to assess contraceptive issues such as use, compliance, adverse effects, and complications. Adolescents should receive ongoing support, personal guidance, and reinforcement to enhance effective and consistent contraceptive use, parental support (when possible), and couples counseling or the opportunity for couples interaction with the health care professional. In addition, condom use at each sexual intercourse must be advised and reinforced at every visit.

RECOMMENDATIONS

1. Pediatricians should encourage sexual abstinence as part of comprehensive sexuality education and services offered to their adolescent patients.
2. Pediatricians should be prepared to offer confidential, nonjudgmental education and risk-reduction counseling around issues of sexuality for adolescent patients, including teens with chronic illnesses and/or disabilities.
3. Pediatricians should be aware that extensive information regarding contraceptive choices and decisions for adolescents with chronic illness or disability are available in references and texts on adolescent medicine (see "Additional Resources").
4. Pediatricians should update each patient's sexual history regularly to counsel about and determine risk of STIs as well as needs for contraceptive initiation and management.
5. Time to counsel, educate, and solve problems regarding contraceptive needs and/or management needs to be a part of any given visit, or arrangements need to be made for a separate visit for contraceptive follow-up.
6. Pediatricians should encourage the consistent and correct use of latex condoms with every event of sexual intercourse.
7. Pediatricians should know that it is appropriate to prescribe contraceptives without a "first pelvic examination," but screenings for STIs, especially chlamydial infections, should not be delayed.
8. Pediatricians should ensure access to basic contraceptive services for their teen patients either within their office setting or by referral to appropriate services and/or sites.
9. Pediatricians who offer contraceptive services to adolescents should provide appropriate follow-up to ensure compliance and monitor for adverse effects and complications.

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